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DANEL TUUSIS

Interest rate influence on the behavior of economic subjects

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2. Sõrg, M., **Tuusis, D.** (2009), "Does interest rate matter: Empirical study of Estonian private persons", Applied Economics: Systematic Research Vol. 3, Issue 1, pp. 89–104.
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INTRODUCTION

Motivation of research and the focus of the dissertation

The interest rate has been considered a most influential determinant influencing the intertemporal behaviour of economic agents. Even though there have been a number of recent empirical studies stating the importance of other determinants, the role of interest rates in intertemporal behaviour remains unambiguously strong. The interest rate influence on the behaviour of economic subjects has been strongly utilised in implementing monetary policies.

The interest rate, as a premium for intertemporal saving and, respectively, cost for consumption, dates back to the early stages of civilization (Homer, Sylla, 1996, pp 8–44). Despite the long history of interest rate studies, a deeper analysis of interest rate influences on economic subjects' behaviour started at the beginning of the 20th century (Modigliani, 1985; Homer, Sylla, 1996, pp. 4–7). The remarkable breakthrough on theories of interest rate influence on the investment by companies, as well as the interest rate influence on households' behaviour, was reached only in the 1950's. Those models of behaviour of companies and households on intertemporal choices state that the demand function of capital is determined by the marginal efficiency of capital and marginal utility of intertemporal saving and consuming, respectively. Investments and borrowing will be undertaken as long as these marginal efficiency and consumption utilities are bigger than the interest rate provided by the market. As long as economic agents are rational towards the maximization of their welfare or towards the maximation of shareholders value, interest rates should clear the market of supply and demand of capital. The influence of agency costs, transaction costs, information asymmetry and other market imperfections have not affected the wide use of those common approaches.

The interest rate has a wide range of influence on the behaviour of companies. In the following table (Table 1) are presented activities of companies, with the core concepts of interest rate influence on those activities. Even though the recent empirical studies have widened considerably the approaches to the behaviour of companies, these concepts are still the basis of modern corporate finance textbooks and are widely used in practical corporate finance.

Table 1. Interest rate influence on behaviour of companies (core concepts)

Activities of companies	**Core concepts**	**see for further discussion**
Investment management	Discounted present value approach	Ross, Westerfield and Jaffe, 2008
Management of capital structure	Modigliani-Miller Models Pecking Order Theory	Modigliani and Miller, 1958; Myers and Maljuf, 1984
Long-term financing and dividends management	Discounted present value approach	Miller and Modigliani, 1961; Henderson, 1995; Fama, French, 2002
Liquidity management	Baumol Model Miller-Orr Model Stone Model	Maness and Zietlow, 1998; Ross, Westerfield and Jaffe, 2008
Pricing and cost management	Different direct and indirect influences of interest rate	Diamantopulus, 1991; Lere, 2000; Blocher, Cokins and Stout, 2006

Source: adapted from Brealey et al, 2007; Ross et al., 2008; complemented by the author

The study of intertemporal behaviour of private persons started to emerge in the 1950's with Friedman's Permanent Income Hypothesis and Modigliani's Life Cycle Hypothesis, where both shared the common assumption of the rational consumer who plans future consumption and attempts to smooth it as much as possible. Both of these models, discussing the consumption, saving and borrowing pattern as well as motives behind it, include the interest rate as an explanatory variable. Further developments of saving and borrowing models have included the dependency of wealth on consumption/saving patterns (Reifschneider et al, 1999), liquidity and collateral constraints (Bernake, Gertler, 1995; Ireland, 2004), etc., but the basic features of intertemporal consumption remained the same. Several recent studies approach household finance similarly to corporate finance (Mishkin, 2007; Weinberg, 2006; Campbell, 2006), whereas other studies, instead of a normative modelling approach, use a wide range of data from questionnaires to analyse the behaviour of private persons' borrowing (Livingstone, Lunt, 1992; Kalafatelis et al, 2005; Stone, Maury, 2006). The challenge of normative household finance is the high complication of decisions and sophistication of intertemporal financial behaviour. An example of the sophistication of decisions is a long-term financial planning with sophisticated illiquid investment opportunities (Campbell, 2006, pp. 1554). Based on the long-term financial planning concept, the long-term investor must consider not only risks to wealth, but also risks to the productivity of wealth, which in turn means hedging requirements to many variables that external shocks can affect. Also, the assessment of the biggest wealth of private persons – human capital –

and hedging risks related to this sort of wealth (Viceira et al, 2001), as well as the risk properties of labour income (Benzoni et al, 2005; Cocco et al, 2005) would show normative and empirical challenges in modelling household finance. Finally, yet importantly, the interpretation puzzle of aggregated data analysis should be mentioned, where the testing model of the permanent income hypothesis has been questioned. The same testing model has been derived for the reverse permanent income hypothesis, applicable in economies of developing countries (Debelle, 2004).

Direct study of borrowing behaviour of private persons would create a rather unambiguous understanding of determinants of borrowing and borrowing motives. It would also help to remodel the borrowing behaviour and behaviour of credit markets, explaining the rationality of borrowers, even if they are not concerned about the interest rates. The direct studies of borrowing behaviour would also help to identify the risk groups in credit market (Kalafatelis et al, 2004; Stone, Maury, 2006; Tuusis, 2010). The permanent income hypothesis of saving suggests that individuals would spend some part of their life in debt, whilst saving and accumulating assets in other parts of the life cycle. Indebtedness therefore is not a problem, even if it lasts for a longer period of life. A deeper analysis of risk group behaviour would indicate questionable assumptions of this approach. The nature of household debt in risk groups differs fundamentally from the nature of debt of rational borrowers. Those debt arrangements would create a cumulative debt problem that clearly overrides life cycle considerations. Within the last ten years there has been considerable growth of studies of indebtedness of risk-group people as well as public protection of people with growing credit. Overall indebtedness has certainly increased the indebtedness of risk-group people, including in Estonia, but still, there are not enough proper studies of it. Several similar studies of developed countries have noted the relative size of the risk-group, between 10% and 30% of the total population (Kalafatelis et al, 2004, pp. 15; Bridges, Disney, 2003, pp. 14–16) whereas in developing countries the size of the risk-group might be significantly more. Taking into consideration the continuous development of financial innovation and aspects of household financial behaviour, the risk-group studies should get more attention also in developing countries.

The interest rate influence on the behaviour of economic subjects could be also discussed through the framework of different channels of monetary transmission mechanisms. Besides the interest rate channel explaining monetary transmission mechanisms through the framework of intertemporal consumption preferences of private persons and the cost-of-capital framework of companies (further also refered as the traditional Keynesian interest rate channel), there are also other channels explaining the transmission of monetary policy to the behaviour of economic subjects (Mishkin, 1996). Based on the intersection of economic subjects' activities influenced by interest rate and different channels of monetary transmission mechanisms, there is presented in Table 2 a summary of activities relating monetary policy mechanisms to behaviour of companies and households. The usage of rather different monetary transmission terminology in

different studies, which are discussed more in detail in the theoretical part of the current dissertation, should be noted.

Table 2. Monetary transmission determined by different aspects of behaviour of companies and households.

Transmission channels	**Companies**	**Households**
Direct monetary transmission	*higher interest would* ***reduce EBT*** *and therefore leave less cash for investments* (Ch 2.2 and 2.3)	*higher interest would reduce* ***disposable income*** *and therefore leave less money for consumption* (Ch 2.1)
Traditional Keynesian interest rate channel	*higher interest increases* ***cost of borrowing*** *and reduces investment expenditure* (Ch 2.2)	*higher interest increases* ***cost of borrowing*** *and reduces demand for durables* (Ch 2.1)
Exchange rate channel	*higher interest rate decreases price of imports (increases price for exports) and influences* ***pricing*** *and profitability of companies* (Ch 2.3)	*higher interest rate decreases* ***price of imports*** *and reduces demand for domestic products* (Ch 2.1)
Tobin q channel	*higher interest would reduce* ***equity prices*** *and company's Tobin q ratio, which reduces investment expenditures* (Ch 2.2)	
Wealth effect channel		*higher interest reduces the* ***value of investments*** *(incl housing and land price) and reduces consumption* (Ch 2.1)
Balance sheet effect (through the net wealth influence) of credit channel	*higher interest reduces the net wealth of company and increases* ***credit rationing*** *for companies* (Ch 2.2)	*higher interest reduces the net wealth of household (incl housing and land price) and increases* ***credit rationing*** *for households* (Ch 2.1)
Risk-taking channel	*higher interest reduces the* ***business confidence*** *and through it decreases investments* (Ch 2.2)	*higher interest reduces* ***consumer confidence*** *and through it reduces demand for durables* (Ch 2.1)

Source: adapted from Mishkin (1996); Amato, Gerlach (2001); Ireland (2005); Mishkin (2007); Cenic (2008); Borio, Zhu (2008); complemented by the author

In comparing the data in Table 1 and Table 2, it appears that some activities of economic subjects influenced by interest rates are not so decisive. In Table 2, the activities of economic subjects are marked as follows: activities directly studied in the current dissertation are marked in bold text; activities which are only discussed on a theoretical part and in the conclusion part of the dissertation are underlined. Here it should be noted about the terminological dispute of monetary transmission mechanisms, distinguishing first step monetary transmission influencing only financial intermediates, and the second step monetary transmission including a wider scale of economic subjects influenced by the monetary policy. Within the study a wider approach to monetary transmission mechanisms is used.

There is also a strong motivation for the topic of the current dissertation, from a practical perspective. Since 2000, there has been a very rapid credit expansion throughout Central and Eastern European (CEE) countries as well as in Estonia. This has been accompanied by a rapid increase in the income level, low interest rates as well as a gradual expansion of financial services together with a relaxation of credit constraints (Coricelli et al, 2006b, pp. 3–6; Tuusis, 2007). Despite the increased tax income, most CEE countries have increased significantly public borrowings, and private indebtedness has risen in all the CEE countries. Financial indebtedness has become a serious problem also in developed countries, where consumer credit has grown more than reasonably predicted (Mohanty, Turner, 2008, pp. 5–9; Doyle, 2009). Even though the low interest rates and the economic growth have been enjoyed recently also in developed countries, the growth in borrowing would still raise questions of economic reasoning of those credits. Also, there is very controversial understanding of monetary transmission channels and monetary policy's ability to influence the economy within larger monetary unions (Kuttner, Mosser, 2002; Ireland, 2004; Mohanty, Turner, 2008). Without a proper understanding of behaviour processes in micro-level studies, monetary transmission mechanisms will remain without proper explanation of the economic processes. Therefore, the motivation of the current thesis is to improve the understanding of micro-level processes and, through this, to widen the scope of discussion of monetary transmission mechanisms in Estonia.

The aim and research tasks

The aim of the dissertation is to study the interest rate influence on the behaviour of economic subjects – companies and private persons – analyzing in detail the motivations behind those different behavioural aspects, and to discuss the results of the analysis in the efficiency context of different channels of monetary transmission mechanisms. Whereas different activities of economic subjects have different influences on the overall economic activity, the most influential activities of economic subjects were chosen for detailed study in the

current dissertation. Even though theoretical development of concepts is presented, the methodology chosen to analyze behaviour of economic subjects would rather indicate a positive approach to the study subject, where the analysis of behaviour of economic subjects is considered *per se*. Therefore, besides the interest rate influence on the behaviour of economic subjects, other determinants of behaviour of economic subjects are discussed and explained. Throughout the current dissertation, the citation consists mainly of studies outside of Estonia; therefore, it would be plausible to assume that the results would be partially applicable in a wider context, even though data refers strictly to the use of results in Estonia. Whereas the dissertation is focused on the behaviour of economic subjects, the total set of activities analyzed within the dissertation would allow drawing conclusions on the efficiency of the monetary policy, and help explain some aspects of recent economic development and future trends in the country. The three distinct empirical studies presented in separate chapters of the empirical part represent three research tasks listed below, as follows.

The *first research task* is to find determinants of borrowing behaviour of private persons in Estonia, analyzing micro-level data of private persons (the chapter 2.1: Borrowing behaviour of households by micro-data analysis). The research focus is on the interest rate influence of several behavioural activities of private persons, such as the evaluation of indebtedness, making borrowing decisions, wider scope of financial behaviour. Even though the study is focused on the interest rate influence on several aspects of financial behaviour, other determinants as part of the financial behaviour are naturally discussed and analyzed as well. The early version of the chapter 2.1 is published in the article "Does interest rate matter: Empirical study of Estonian private persons" (Sõrg, Tuusis, 2009a).

The *second research task* is to find determinants of investment activity of Estonian companies (the chapter 2.2: Investment management of Estonian companies). Within these determinants, the role of interest rates and the framework of cost of capital have special attention. Within the analysis of interest rate influence on investment decisions of companies, besides the dependency analysis, a wider approach has been chosen to explain reasons and motivations behind the interest rate influence on the management of companies. The early version of the chapter 2.2 is published in the article "Does interest rate matter: Study of Investment Management of Estonian Companies" (Tuusis et al, 2010).

The *third research task* is to investigate the price setting motives and mechanisms in companies, and analyze the interest rate influence on pricing (the chapter 2.3: Pricing behaviour and price management of companies). The management of prices is considered the most effective response of companies to changes in the external environment. Therefore, the interest rate influence on prices should indicate the effectiveness of several cost channels of monetary transition mechanisms, directly influencing inflation. Whereas previous empirical studies have controversial findings in pricing motives and pricing methods, the discrepancy of those studies should be analyzed and explained. Based on

those results, the interest rate influence on the pricing, and pricing motives, should be better understood and explained. The early version of chapter 2.3. is published in the article "The influence of financial indicators in the management of prices" (Tuusis, 2007).

The above-mentioned research tasks are also analyzed in other papers written by the author, solely or in cooperation with other authors, and citied in the current dissertation, respectively.

The structure of the dissertation

The current thesis consists of three chapters: the theoretical part, empirical part based on three articles mentioned above, and the discussion chapter. The overall structure of the dissertation is presented in Figure 1.

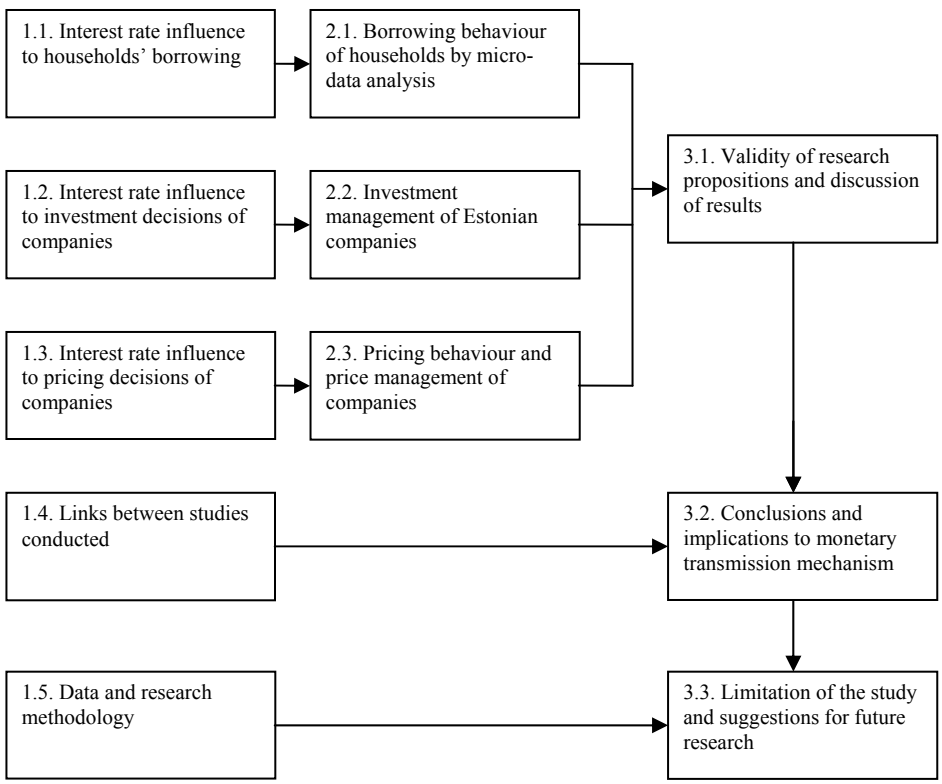

Figure 1. The structure of the dissertation.
Source: compiled by the author

The first part provides the theoretical foundation for the dissertation of the interest rate influence on the behaviour of economic subjects. The first part is divided into five chapters where the first three chapters are directly devoted to the behaviour of economic subjects. The first chapter discusses the interest rate influence on household borrowing, whereas the traditional descriptive models, such as life-cycle model and permanent income hypothesis, are discussed at a detailed level. A separate subchapter introduces financial mis-management models and the questionnaire method, which are used in the empirical study. Finally, study propositions are drawn for the borrowing and financial behaviour of private persons. The second chapter discusses different investment decision models of companies, where the interest rate influence is involved. The chapter ends with study propositions for investment behaviour of companies and the interest rate's influence on it. The third chapter presents recent academic discussions of pricing objectives and pricing methods of companies, whereas the cost-plus pricing method is presented in detail. The contradictory empirical findings of several other empirical studies, which created the strong motivation for the author to analyze the subject, are presented. The fourth chapter introduces different channels of monetary influence, which create the link between the studies conducted. The fifth chapter of the theoretical part of the current dissertation presents the overview of data and methods used in the empirical part of the dissertation, and briefly describe the limitation of data and methods used in each empirical study.

The second part of the current dissertation consists of three empirical studies that are briefly described as follows. 1st study analyses the borrowing behaviour and determinants of borrowing behaviour of private persons using the questionnaire methodology. To cover the full scope of the households' financial behaviour, the study was divided into three subchapters. The first part deals with the influence of interest rates on indebtedness. The second part analyses in more detail the borrowing decision-making process, and evaluate determinants of this process. The third part deals with overall financial behaviour and looks at interest rate influences on it. 2nd study discovers determinants of investment decisions of Estonian companies and analyzes motives behind them. The study sample covered large Estonian companies where respondents were top managers of those companies. This study was divided into three parts where, in the first part, determinants of investment decisions were found and ranked in line of importance; the second part focuses on a deeper analysis of the cost of capital influence on investment decisions, and the third part focuses on the analysis of financial constraints of companies. 3rd study presents a deeper look into the price management of companies through the case-study analysis. These case-studies in Study IV paid special attention on the managers' view for pricing procedures, pricing objectives, pricing determinants and other managerial issues related to pricing. Within the study, special attention was given to the interest rate influence on pricing through the cost-plus method, as well as to the possible exchange rate influence on the price setting and price management.

The third part of the current dissertation synthesizes findings from studies of the empirical part of the dissertation, as well as findings of the theoretical part of the dissertation. The conclusion consists of three chapters where the results of the study are discussed in detail, integrated with each other and to findings of other empirical studies in that field. The first chapter discusses results of study propositions presented in the theoretical part of the study for each group of the economic subjects. Beside these propositions, the analyses of findings beyond the proposition framework are presented. There has been found several important considerations for the behaviour of companies and private persons, which explain findings of other empirical studies or argue against them. In the second chapter of the conclusion the interest rate influence on the behaviour of economic subjects are presented within the framework of different channels of monetary transmission mechanisms, whereas the discussion of total efficiency of each channel is divided between the companies and households. The final part of the conclusion discusses the three most influential limitations of the current dissertation and outlines a direction for further studies, where, besides the focus on monetary transmission mechanisms, other important directions are proposed.

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I. THEORETICAL BASIS FOR THE RESEARCH

1.1. Interest rate influence on household borrowing

1.1.1. Life-cycle hypothesis and permanent income hypothesis

The studies of saving behaviour dates back to the 1930s, where the analysis of household behaviour consisted firmly on studies of consumption behaviour (Modigliani, 1985, pp. 151). According to the Keynesian economy, the consumption function as a determinant of aggregate demand included "saving goods" as a fraction of income, which reduced the income households could otherwise spend. The "saving goods" was treated more of a psychological phenomena than as a separate subject of economic discussion and was seen as a superior commodity – like luxury commodities. There was rather little attention to analysis of deeper motivation and determinants of rational consumer behaviour in allocating their income to savings and, respectively, the dissaving problems of poor people.

Early studies of intertemporal choices are as old as the overall consumption analysis, where intertemporal consumption was studied based on the concept of saving as goods, in a bundle of goods. This intertemporal model consisted of consumption of a single good within the two time period with an intertemporal budgetary constraint, where first period income and consumption are noted as Y_1 and C_1 and second period variables Y_2 and C_2 respectively; r denotes the real interest rate for the period.

$$C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r}$$

The consumer will allocate its consumption across two periods in a way where the highest level of utility is achieved and the budget constraint will be satisfied. Utility maximation and marginal rate of intertemporal substitution could be described as follows:

$$V(C_1, C_2) = U(C_1) + \beta U(C_2)$$

$$0 = U'(C_1)dC_1 + U'(C_2)dC_2$$

$$\left.\frac{dC_2}{dC_1}\right|_V = \frac{-U'(C_1)}{\beta U'(C_2)}$$

Combining the utility maximization and intertemporal budgetary constraints would give a better visualisation of intertemporal utility preferences of consumption at different periods of time:

$$\frac{U'(C_1)}{\beta U'(C_2)} = (1+r)$$
$$U'(C_1) = \beta(1+r)U'(C_2)$$

This intertemporal optimisation condition says that the marginal utility of consumption in the first period must be equal to the discounted (expected) marginal utility of consumption in the second period. Contrary to Keynesian's consumption function, Fisher's consumption model depends on current and future income, whereas the increase in current or future income will increase current and future consumption, respectively. This could be seen as a consumption smoothing motive, used widely in further models of consumption/ saving patterns of households. In periods where income is low relative to average income over the life-time, households will borrow to fund current consumption (or alternatively run down their asset holdings). The loan is then repaid (assets are accumulated) in periods where income is high, relative to average life-time income.

The behaviour framework behind the Fisher model was further developed to explain the findings of a number of empirical studies of saving and consumption in the 1950's and 1960's. In the 1960's, two groups of authors proposed the Forward Looking Theories of Consumption – M. Friedman's permanent-income hypothesis, and F. Modigliani's life-cycle hypothesis – which have remained in use until today in academic work as well as in empirical and practical usage. The intuition behind the assumption described in further parts of this subchapter is that consumers are forward looking individuals who calculate rationally their future consumption, and then attempt to smooth consumption as much as possible. Different to the early studies, several assumptions were added to the model, such as the consumption dependent on wealth and income, different periods of the life cycle including retirement, unemployment, etc., and the difference between the transitory and permanent income. All these influences made the Forward Looking Theories of Consumption more applicable for empirical studies and introduced a distinctive approach to consumer finance.

A consumer who plans to spend all of his assets before he dies will have an actual consumption plan that is constrained by the following budget constraint at time t[1]:

$$\sum_{k=0}^{T-t}(1+r)^{-k}C_{t+k} = A_t + \sum_{k=0}^{T-t}(1+r)^{-k}Y_{t+k}$$

[1] The following model reproduction follows the specifications of Deaton (1992, pp. 136–174). There are several restrictive assumptions, such as additive and quadratic intertemporal utility function for constant relative risk aversion, constant rate of return which is equal to the discount rate, etc.; for details see Deaton (1992, pp. 76–101, 148–154).

where A denotes the initial wealth, C_i stands for consumption and Y_i for income. Taking the expectations of this relationship, using $E_t[C_{t+k}] = C_t$ (for all k) and letting T go to infinity, then:

$$C_t = \frac{r}{1+r} A_t + \frac{r}{1+r} \sum_{k=o}^{\infty} (1+r)^{-k} E_t Y_{t+k}$$

Intuitively, it could be stated according to the formula that total expected wealth (which could be consumed) is the discounted value of initial wealth to the future period of t and the discounted sum of expected future income, whereas planned consumption for each time period is $r/(1+r)$ multiplied by total wealth.

For a better interpretation the expression for the deducting saving/borrowing motive for total consumption can be rewritten in two ways:

$$C_t = r(A_{t-1} + Y_{t-1} - C_{t-1}) + \frac{r}{1+r} \sum_{k=0}^{\infty} (1+r)^{-k} E_t Y_{t+k}$$

since the wealth A at the period t can be written

$$A_t = (1+r)(A_{t-1} + Y_{t-1} - C_{t-1})$$

and replacing it with the consumption C at the period t would be

$$(1+r)C_{t-1} = rA_{t-1} + rY_{t-1} + \frac{r}{1+r} \sum_{k=0}^{\infty} (1+r)^{-k} E_{t-1} Y_{t-1}$$

Rewriting those two equations yields the following:

$$\Delta C_t = C_t - C_{t-1} = \frac{r}{1+r} \sum_{k=0}^{\infty} (1+r)^{-k} (E_t - E_{t-1}) Y_{t+k}$$

This equation states that the change in the consumption from time $t-1$ to time t depends primarily on changes in expectations about future income (sometimes $(E_t - E_{t-1})Y_{t+k}$ is referred to as "news" about future income), but also a discount rate of intertemporal choices. Moving C_{t-1} to the other side of this expression is another way to rewrite this expression. Then it could be easily seen that current consumption equals past consumption plus the revision from time $t-1$ to time t in predictions for income at time t, time $t+1$, time $t+2$, etc. Interestingly, the lagged income (e.g. Y_{t-1}, Y_{t-2}) does not appear in this expression. The consumption during time $t-1$ is all one needs to know about all events in the past (time $t-1$ and earlier) to determine what current consumption C_t will be. In the

next subsection the influence of wealth on the behaviour of private persons will be discussed in a more explicit way[2].

To discuss the result in a more general way, considering the life-cycle of private persons, the standard upward sloping path for labour income over the working life of private persons could be assumed. Persons dis-save in the early part of their working life, and their consumption is financed by borrowing. As persons age and labour income grows, indebtedness decreases, and once the debt is repaid, assets will be accumulated. Later in life, when the persons are no longer working, they dis-save again by consuming the earnings on their accumulated assets, gradually running down their stock of wealth. The debt position of an individual person can therefore be determined by the path of future income and the interest rate (relative to the discount rate).

The equation describing saving/borrowing activities of private persons has been widely used in empirical studies in different countries using different product groups to test the validity of the Forward Looking Theories of Consumption, where the testing models rely directly on the borrowing equation described above. The following overview consists mainly on studies analysing the borrowing activity and determinants of credit behaviour of different financial product groups, based on the direct test of the above-mentioned model. These studies show that the development of private sector loans can be reasonably explained by aggregated macroeconomic variables, and find evidence for a stable long-run relationship between real loans, GDP and real interest variables[3]. These findings are applicable on credit growth of the euro area, using different econometric approaches (Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006), as well as in Austria, including some part of private sector debt (Fritzer, Reiss, 2007), a consumption credit in Belgium (Jeanfils, 2000), credit growth in Japan (Suzuki, 2004) and in Australia (Blundell-Wignall, Gizycki, 1992). One problem of most of these studies mentioned above is that the estimated credit demand equations may also capture supply effects. Therefore, some studies have included in their testing models a larger number of variables (Hülsewig et al, 2004; Kakes, 2000), especially separate interest rates, to proxy interest rates to be paid and interest rates banks can borrow at. There are several studies including other explanatory variables such as property prices (Hofmann, 2001; Fitzpatrick, McQuinn, 2007; ECB, 2007), share prices or other security prices (Filardo, 2004; Detken, Smets, 2004), inflation and unemployment as proxies for uncertainty and expectation for future variables (Gabaix et al, 2006; Fritzer, Reiss, 2007), liquidity and collateral constraints

[2] Most studies of developing countries do not include wealth as a measurable parameter (Arvai, Toth, 2001; Coricelli et al, 2006a; Chen et al, 2008). First, there might be a problem of data reliability. Second, the wealth might not be as significant a variable in explaining the credit growth in transition countries (Paabut, Kattai, 2007), as opposed to studies of more developed countries.

[3] There is a variation across countries on different statistical definitions of the household sector. In some countries unincorporated (generally small business) loans are included in the household sector data, whereas in other countries they are not. See ECB, 2004

(Egert, Mihalje, 2008). Some of those relevant implications to the Forward Looking Theories of Consumption are based on recent theoretical and empirical studies and will be discussed and analysed in the next subsections to outline empirical studies of the current dissertation as well as to discuss, for future studies, indebtedness in Estonia.

The wide use of aggregated data in sophisticated econometric models requires a careful selection and analysis of proxy variables in the testing model. Most of the authors quoted above use for the subject of analysis the entire private sector credit (Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006; Blundell-Wignall, Gizycki, 1992), due to similar factors affecting corporate demand for loans, as well as for household demand for loans. In the countries where the market of corporate financial products is well-developed (Suzuki, 2004), or there is a problem of data limitations (Fritzer, Reiss, 2007, pp. 122), the same approach will be obviously not appropriate for use. The proxy for income in these empirical studies is, typically, the real GDP – it has been used in all of the studies quoted above – accompanied in some studies with the GDP deflator (Calza et al, 2003). As the discount variable, the real interest rate has been used (Fritzer, Reiss, 2007; Suzuki, 2004; Backe et al, 2006) as well as nominal interest rates (Tsatsaronis, Zhu, 2004), whereas nominal interest rates perform better than real interest rates in explaining credit decisions[4]. Also, the quarterly frequency of those kinds of studies is standard frequency in the literature.

Despite the rather dense use of the Forward Looking Theories of Consumption in several empirical studies to find explanatory variables for credit growth, there are several implications which should be carefully considered when using empirical tests and, later, interpretation of those findings. Explanatory variables included in the model could have, instead of an expected direct influence on the credit growth, an indirect influence (Fritzer, Reiss, 2007, pp. 126, 131–132; Mishkin, 2007; Catte et al, 2004), or the proxied variables could have a diverged meaning of usage (Tsatsarronis et al, 2004). There could also be the phenomena of a reverse-type of life-cycle consumption model (Debelle, 2004) where in some developing countries with a low endowment of initial wealth and rapid liberalisation of liquidity constraints for households, it would induce a strong dissaving activity of middle-age people and have a rather low activity level in the younger and eldery sides of age groups. Those implications would require futher development of testing models, or could be solved with use of several simultaneous studies using different methodologies.

[4] This is due to the fact that banks typically make decisions to grant household loans based on the ratio of debt servicing costs to income, which are dependent on the nominal interest rate and not the real interest rate (Tsatsaronis et al, 2004). This approach is in line with empirical studies testing wealth channel efficiency of monetary transmission mechanisms for households, using also nominal interest rates (Catte et al, 2004; Rio, Young, 2005).

Finally, the linearity problem of empirically tested models should be discussed. The intensive use of GDP as a proxy for income in empirical studies could create a problem, where the household credit growth might be induced by the real consumption growth. Very few empirical studies are noting the problem, whereas even fewer studies consider the positive feedback influence problem and try to measure it (Aoki et al, 2002; Coricelli et al, 2006a). As the study indicates, the positive feedback can be measured separately and, based on the results, the applicability of the linear testing model could be decided and further testing approaches designed. A possible estimation of the feedback problem is to measure the consumption influence on borrowing. Expansion of credit that is permanently and excessively exceeding the equilibrium level with borrowing demand would cause the appearance of overheating of the economy, accompanied by asset price bubbles (Detken, Smets, 2004), fast growth of real estate prices (Egert, Mihalje, 2008, pp. 4–7; Anette, 2005), price bubbles on different commodity markets (Mendoza, 2002; Detken, Smets, 2004; Filardo, 2004), deterioration of the external balance and trade balance (Sõrg, Tuusis, 2005; Coricelli et al, 2006a) and growing inflation (Gabaix et al, 2006). There could be considered the inflow of other types of financial resources such as portfolio investments and foreign direct investments, whereas in some CEE countries the effect can be considerably higher than in other countries (Sõrg, Tuusis, 2006, pp. 136–138; Coricelli et al, 2006a). It should be stressed that these quantitative analysis methods do not distinquish between the effect of deterioration of external balances and trade balances due to the higher import of required machinery and equipment (Farrell et al, 2004; Sõrg, Tuusis, 2006), and inflation pushed higher by salary increases for a qualified labor force. Further chapters of the current dissertation discuss those methods to measure positive feedback, which still might not be enough to distinquish the existence of nonlinearity.

There are several other approaches to test the validity of the Forward Looking Theories of Consumption, which inherit the same framework described above. To interpret the formula in another way, ΔC_t could predict the changes in expectations of future incomes. This interpretation of the formula has been tested in several empirical studies (Bernake, Gertler, 2000; Catte et al, 2004; Rio, Young, 2005; Sellin, Walentin, 2008), analysing the occasional income growth influence for the current consumption. As the study results show, the occasional income "shocks" tend to have a much larger effect on current consumption than the expected effect, which could be taken as evidence against the Forward Looking Theories of Consumption. Another approach, which sticks to the above-mentioned framework of the Forward Looking Theories of Consumption, assumes an infinity of time preferences, modelling the aggregated level of borrowing behaviour known as the 'overlapping generation model' (Lindbeck, Weibull, 1986). Even though the model has the same framework as the Forward Looking Theories of Consumption, the results end differently from traditional testing models, stating the strong influence of several different testing variables. Therefore, extrapolation of the results from one model to

another, using the same basic framework, could give rather different results. The high variability of the testing models, based on the Forward Looking Theories of Consumption and shaped according to the data available, should be noted. A variety of testing models increases also due to including specifications of country-level legal and behaviour characteristics of households, as well as several dummy variables for identifing behaviour of different household groups (Cox, Japelli, 1993; Gropp et al, 1997; Fabbri, Rosenthal, 1993; Magri, 2002**;** Crook et al, 2003).

Another group of empirical studies testing the Forward Looking Theories of Consumption is in the comparison of countries and explaining of differences in saving and consumption behaviour of different countries. The implications of theories are quite novel and, therefore, there is emerged a high interest for empirical testing. The list of some of these implications is presented as follows (Modigliani, 1985, pp. 154):

1. The savings rate of a country is entirely independent of its per capita income.
2. The national savings rate is not simply the result of differential thrift preferences of its citizens, in the sense that different national savings rates are consistent with an identical individual behaviour.
3. Between countries with identical individual behaviour, the aggregate savings rate will be higher the higher the long run growth rate of the economy is. It will be zero for zero growth economies.
4. The wealth-income ratio is a decreasing function of the growth rate, thus being largest ate zero growth
5. An economy can accumulate a very substantial stock of wealth, relative to income, even if no wealth is passed on by bequests.
6. The main parameter that controls the wealth-income ratio and the savings rate for given growth is the prevailing length of retirement.

None of these long and short run implications of the basic model could be explicitly tested, due to the lack of direct reliable necessary data. In the 1960's and 1970's the early tests of those propositions were carried out, and test results themselves were quite successful (Modigliani, 1985, pp. 158, Leff, 1969). Later, empirical studies would require a careful preparation of comparable data of different countries and, therefore, the results of the preposition analysis could be easily misinterpreted. Studies focusing on the length of working life and retired life in different countries have pointed out that in economies endowed with higher productivity (and hence with greater income per capita), households might take advantage of this and could choose to work for fewer years (Diamond, Hausman, 1985). This, in turn, would result in a higher national savings rate, thus creating the possibility where the savings rate could be affected by income per capita, explaining empirical findings of the violation of the first preposition. Another explanation for those empirical findings could be the lack of state social security, which encourages savings (Modigliani, Sterling,

1981). Another widely tackled problem consists of the empirical evidence where the elderly continue savings, or dissavement would not be as obvious as it should be. These anomalies would also not immediately violate the life-cycle hypothesis where the explanation can be a biased sample group – a steady increase in educational attainment and the changing socio-economic status would increase the participation rate of elderly people in society (Mirer, 1979), or elderly people could have a direct impact on the dissaving of younger generations (Hurd, 1986). Also, a distinctive study should be made to discover the investment instruments of households, where the owning of liquid financial securities and cash could distort the complete picture of savings. In addition, the inheritance motivation should be considered.

1.1.2. Other models explaining borrowing activity

Several papers have developed further the Forward Looking Theories of Consumption including implications of the wealth effect and implications of collateral or liquidity constraints. According to those theories, aggregate household debt also depends on demographic factors, the expected path of future income and real interest rates, with the household aim being to smooth consumption over time. Considering, additionally, uncertainty and non-asymmetric horizontal information problems, there should be considered the moral hazard and temptation for credit rationing. It leads to the models where household constraints are included. The influence of wealth to households' life-cycle theory has been briefly discussed above. In this subsection the main focus will be on credit constraints' influence to borrowing activity; also briefly is mentioned the wealth influence to those credit contraints.

The basic set-up of constraints is inherited from the life-cycle model of consumption, restricting the borrowing behaviour of private persons in two ways. The strong definition of credit constraints states the complete restriction of additional borrowing as follows: "an individual or household is liquidity constrained if he is unable, for whatever reason, to borrow against future earnings beyond a certain limit, which can be positive or zero" (Chan et al, 1995, pp. 274). Considering the framework of the Forward Looking Theories of Consumption presented in the previous sub-chapter, the private person could face the maximum credit limit $(A_1^{LC} + Y_1^{LC})$, instead of the desired level of credit $(C_1 - (A_1 + Y_1))$ which constrains consumption at the level of $(C_1^{LC} - (A_1^{LC} + Y_1^{LC}))$. The liquidity constraint model can be settled for different purposes; in the following discussion it is the rather obvious purpose, related to academic and practical interest of the default behaviour of private persons. Based on the moral hazard and adverse selection problem, the private persons' indebtedness should be constrained by financial institutions in the cases where the consumers' utility maximization, without consumption/borrowing limitation, will be influenced. The utility maximization and budget constraint in the two-period life-cycle model can be derived from the Forward Looking Theories of

Consumption presented in the previous sub-chapter, and would be as follows (Lawrence, 1995; Gary-Bobo, Larribeau, 2003, pp. 381–383; Rinaldi, Sanchis-Arellano, 2006, pp. 12–17)[5]:

$$V(C_1, C_2) = U(C_1) + \frac{1}{1+\delta} EU(C_2)$$

where δ is the subjective rate of time preference and $\beta = 1/(1+\delta)$. The second period total income is assumed to be a stochastic process, where the income, Y_L, appears with probability w, while Y_H appears with probability $(1-w)$. Also, the private person can borrow x_1 amount of money to increase consumption in period 1, but has to repay in the second period x_2, while facing the borrowing constraint. The intertemporal expected utility with budget constraints would be:

$$V(x_1, x_2) = U(Y_1 + x_1) + \beta\left[wU(Y_L + x_2) + (1-w)U(Y_H + x_2)\right]$$

$$x_2 = (1+r)x_1$$

where r is the exogeneous risk free interest rate. In the supply side it is obvious that, with probability of w, the bank has the possibility to receive less (or no) repayment of credit, which would induce the bank in a competitive zero-profit environment, to charge an additional risk premium rp, and the competitive interest would be:

$$1 + R = (1+r)(1+rp)$$

whereas

$$1 + rp = \frac{1}{1-w}$$

Moreover, banks are willing to lend at $1 + R$, up to the maximum loan size b_{max}, which would be affordable for the borrower, who receives Y_H in period two:

$$b_{\max} = \frac{1}{1+R}(Y_H - Y_L)$$

To extend the descriptive power of the model without losing the generality of the model, it could be assumed that a share of the loan might be used for real or

[5] Two-period model is a rough approximation of the private person's life-cycle consumption consisting period with high income, and low income after retirement. For a discussion of the multi-period intertemporal model for constraints, see Lawrence, 1995.

financial investment, denoted with I[6]. The investment, together with possible initial wealth, yields a different rate from the interest rate charged by the bank, whereas in the current model the initial investment value is denoted with I_1, and the value in second period is I. The borrower's expected utility and budget constraint would be:

$$V(x_1, x_2) = U(Y_1 - I_1 + x_1) + \beta\left[wU(Y_L) + (1-w)U(Y+I)_H + x_2\right]$$

$$x_2 = -(1+R)x_1$$

Maximization of borrowers' utility, where *MRS* stands for marginal rate of substitution, by finding the first order condition which defines the desired loan size of a borrower facing a bancrupcy, with probability of q would be:

$$MRS_B = \frac{(1+\delta)U'(Y_1 - I_1 + x_2)}{(1-w)U'((Y+I)_H + x_2)} = 1 + R$$

and the bancruptcy probability w would be as follows

$$w = \frac{(1+r)U'((Y+I)_H + x_2) - U'(Y_1 - I_1 + x_1)(1+\delta)}{(1+r)U'((Y+I)_H + x_2)}$$

It follows that the probability of default depends on the amount of credit taken (and the amount that should be repaid), on the current income and investments. The empirical studies have widely used this model for testing borrowing behaviour, whereas different proxies and interpretations of variables have been used[7]. Early studies focused more on the determinants of liquidity constraints (Campbell, Mankiw, 1989; Brunilla, Takala, 1993), whereas later studies focused more on the behavioural characteristics of private persons. The variable w has been proxied by several indicators analysing the direct bankruptcy cases in society (Rinaldi, Sanchis-Arellano, 2006, pp. 15), as well as delayed payments selected by some criteria (Whitley et al, 2004), or the amount of default loans by credit institutions (Moody's, 2003). These empirical studies could indicate the possible outcome of increased debt levels where the new equilibrium approach can be compared with the riskier financial position of private persons and the financial sector of a country.

[6] Different investment opportunities can offer different real yields, and would affect in turn the interest charged by bank, which creates non-linear constraint models of borrowing behaviour. See for further discussions Cox, Japelli (1993) and Engelhardt, Mayer (1998).

[7] It should be noted that the empirical testing should be carefully planned; specifics of available data considered and proper modelling of financial market characteristics should be done. See for further discussion Lawrence (1995), Crook (2003) and Valdemarra (2007)

The weak form of constraints states that an individual or household is liquidity constrained if they are able to borrow at relatively low rates against the security of their house, but have to pay considerably higher rates for unsecured borrowing[8]. This is the basic assumption of collateral constraint implications of the Forward Looking Theories of Consumption which was discussed in the previous sub-chapter of the current study. The utility is determined by the consumption of two periods as follows:

$$V(C_1, C_2) = U(C_1) + \beta U(C_2)$$

Private persons can borrow against the collateral – s_t is amount of secured loan at time t – and without any security – u_t is amount of unsecured loan at time t. Households face the budget constraint given as follows:

$$s_t + u_t = p_t c_t + q_t H_t + (1 + r_{t-1}) s_{t-1} + (1 + r_{t-1} + rp_{t-1}) u_{t-1} - p_{t-1} H_{t-1} - Y_{t-1}$$

where p is the price of consumption of goods and c is the amount of consumption; q is the price for housing and H is the amount of housing. The maximum amount of loan b_{max} is constrained by the value of collateral

$$b_{\max} = \Phi q_t H_t$$

where Φ denotes the "safety" proportion of the value of collateral, stating that the maximum amount of secured debt cannot exceed the proportion of the value Φ of the private person's house $q_t H_t$. The choice of how much to borrow secured debt and how much unsecured debt is determined by preferences to consume, and preferences to spend, on housing. FOC for intertemporal consumption would be

$$\frac{\partial v_t}{\partial c_t} \Big/ \frac{\partial v_{t+1}}{\partial c_{t+1}} = \frac{(1 + r_t + rp_t) p_t}{(1 + \delta) p_{t+1}}$$

FOC for the choice between housing and consumption goods would be

$$\frac{\partial v_t}{\partial c_t} \Big/ \frac{\partial v_t}{\partial H_t} = \frac{(1 + r_t + rp_t) p_t}{(1 + r_t + rp_t) q_t - q_{t+1} - rp_t q_t \Phi}$$

[8] Similar model of quantitative credit constraints has been presented by Mendoza (2002, pp. 12–16). The two-rate model, presented in the current paper, could better gather the liquidity constraint issue, where the recent outburst of financial services would rather indicate the unlimited borrowing option for households, see Chen et al (2008) and Bianchi (2009).

Both these intertemporal and intratemporal consumption decisions depend on the interest rate for unsecured borrowing. It can easily be seen that when the secured debt constraint is not binding, the risk premium will drop out of these formulas, which would in turn have a relative increase effect of raising future consumption and changing the effective relative price of housing. There is also a possible corner solution where consumption choices could be made at the secured borrowing rate, but this violates again the budget constraint conditions. There are several empirical studies using the approach of two-rate borrowing (Cox, Japelli, 1993; Gross, Souleles, 2001), or using directly these formulas to derive testing models (Japelli, Pagano, 1989; Fernandez et al, 2002; Rio, Young, 2005). It has been found that a large spread between the lending and borrowing rate, lower loan-to-valuation ratio and a lower rate of home ownership could indicate a higher usage of liquidity constraints in society (Japelli, Pagano, 1989). Also, the loosening credit constraints, due to the financial deregulation during the 1980's and 1990's, had a significant effect on indebtedness and consumption of private persons in several countries (Miles, 1992; Bayoumi, 1993; Fernandes et al, 2002). Using those models on empirical tests, different proxies have been used also for other variables than bankruptcy probability. In the analysis of non-performing loans in the UK the unemployment ratio was used to proxy the probability of default and the time preference of consumers was proxied by inflation (Rinaldi, Sanchis-Arellano, 2006, pp. 18–20). Very often other, different variables have been added to the testing models where additional conclusions for default behaviour or to credit growth can be derived (Cox, Japelli, 1993; Gross, Souleles, 2001; Whitley et al, 2004; Rinaldi, Sanchis-Arellano, 2006).

Liquidity constraints are most binding on the purchase of housing and provide an explanation for the hump-shape pattern of home ownership and household debt over the life-cycle that is observed in many countries (Crook 2001; Debelle, 2004, pp. 28–37; Campbell, 2006, pp. 1580–1586; Doyle, 2009). Households tend to rent in the earlier stages of their life, when they are more likely to be liquidity constrained, as it allows them to consume a higher level of housing services than that which could be obtained by purchasing a house with their low level of saving and restricted access to credit. Over time, as the household's income and savings grow and, from the lender's point of view, uncertainty about the future path of labour income declines, liquidity constraints are eased, so that the household can now borrow the large sum required to purchase a house. Several studies focus on the indebtedness and home ownership (Miles, 1992; Engelhardt, Mayer, 1998; Case et al, 2001; Bajari et al, 2003; Debelle, 2004). Some studies argue for a strong positive relationship between aggregate housing wealth and consumption (Case et al, 2001; Mishkin, 2007); others would find it weak (Bajari et al, 2003; Debelle, 2004) or counterbalancing each other (Andersen, Kennedy, 1994).

Taxation implications should be also considered in the borrowing modelling of different countries, where different countries use different rates and taxation principles for mortgages (ECB, 2003). In most of countries mortagage interest

payments are tax deductible, whereas housing is a part of wealth taxation. Taxes are considered as the main fiscal instument to correct housing market imbalances and reduce housing market volatility (Wolswijk, 2005). The impact of taxation could be mainly considered through the reduced mortgage interest relief and increased reliance on automatic stabilisation of the housing market via regular updates of housing values relevant for property and other taxes.

Finally, on liquidity constraint and housing price implications, the accelerator channel should be discussed as a part of the wealth channel and the credit channel of monetary transmission mechanism. A rise in the value of the collateral provided by the house of a private person will allow them to finance greater consumption by borrowing against the increased value of the house (Mishkin, 2007; Crook, 2003; Debelle, 2004, pp. 25; Aoki et al, 2002). Although households are fully rational, they fail to internalize how additional borrowing results in these debt-inflation amplification effects when the positive/negative shock inflates/deflates the credit constraints (Bianci, 2009). These accelerator effects will be discovered by a significant distortion between tradable and non-tradeable goods according to the modified Forward Looking Theories of Consumption (Bianci, 2009), whereas some other studies outline the supply side of credit markets in the aggregated level of the economy, where innovation by financial intermediates has an influential role in the accelerator effect on households on the demand side (Schneider, Tornell, 2000; Gertler, Karadi, 2009). The accelerator channel approach has also been used by some empirical studies analysing the fast credit growth development of CEE countries (Coricelli et al, 2006a; Debelle, 2004). The empirical part looks at the rapid credit development of CEE countries in early 2000, where the volatility of household consumption is much less than the volatility of disposable income. Those effects are explained by the development of the credit institutions, overall financial liberalisation, succesful monetary and fiscal reforms as well as the influence of the integration process in the European Union (Coricelli et al, 2006b, pp. 3–6). All these factors have influenced the credit growth in CEE countries, even though the efficiency of the wealth channel, compared to the efficiency of the credit channel of monetary transmission mechanisms in those countries is not so obvious. Several studies, mentioning loosened credit constraints on the introduction level of the studies, do not include them in the empirical part of the research (Nieto, 2007; Fritzer, Reiss, 2007).

Another approach to explain borrowing and lending activity is that they are determined externally only, by interest rates (Mishkin, 2001, Fritzer, Reiss, 2007, pp. 124–126; Mehrling, 2005) and referred to also as the monetarist transmission mechanism. Even though the monetarist approach would mean the strict neutrality of the interest rates on the behaviour of economic agents, and have a rather different approach to the intertemporal choices of economic agents (Meltzer, 1995), the interest rate could be considered as an indirect measure of credit expansion. One explanation for this is that it could work through the banks' liabilities, where a decrease of the Central Banks' repo rates would obviously encourage bond holdings by financial intermediaries and, through

that, increase the demand for bonds and loan products (Mehrling, 2005). In this case, households are expected to decrease savings and increase spending and/or borrowing. This approach has seen relatively low usage in empirical studies even though the model has been used to explain several cases of recessions (Meltzer, 1995), and monetary policy efficiency in case of deflation (Krugman, 1998). The liquidity effect created by the monetarist transmission mechanism is counterbalanced in other studies by the anticipated inflation effect (Li, 2000). Here, an expansionary monetary shock leads households to expect that the rate of inflation will increase. Households, therefore, move out of cash and increase demand for credit, which results in an increase in the nominal interest rates and a reallocation towards credit services. This reallocation approach has been used in a number of empirical studies where results have been either supportive (Kaufmann, 2001; Nieto, 2007), or less supportive (Valdemarra, Kaufmann, 2004).

1.1.3. Models of financial mismanagement and questionnaire methods

Many authors have realised, in their studies, the weak rationality of households in the context of their behaviour preferences. The Forward Looking Theories of Consumption presupposes a substantial degree of rationality and self control to make preparations for retirement consumption needs. Many households seek advice from financial experts, etc., yet some households make decisions that are hard to reconcile with any standard model (Campbell, 2006, pp. 1554–1555). An obvious response to this observation is to maintain the assumption that actual and ideal behaviour coincide, but to consider nonstandard behavioural models of preferences that incorporate phenomena such as mental accounting and loss aversion. An alternative response is to abandon the framework of revealed preferences and consider the possibility that households may not optimally express their preferences (Gabaix et al, 2006). This would lead to views of behavioural finance based on the models of financial mismanagement or to experimental household finance.

Whereas the empirical testing of the Forward Looking Theories of Consumption is challenging due to the parameterisation, on one hand, and the existence of several parallel monetary transmission mechanism channels on other, the testing of models of financial mismanagement is even more complicated. Still, there are some empirical papers of financial mismanagement that have been carried out, analysing different financial instruments of unsecured consumer credit (Ausubel, 1991; Calem, Mester, 1995; Gross, Souleles, 2001; Sulaiti, 2006). The most popular research topic has been the stickiness of the credit card interest rate. Credit cards play an important role in consumer finance, where more than 20 percent of aggregated personal consumption in developing countries is already being purchased using credit cards (Chimerine, 1997). Moreover, most credit cards also represent the leading source of

unsecured credit, which would allow for analysing, in a combined way, consumption behaviour and borrowing behaviour. For credit card users, the annual interest rate charged by use of credit would be irrelevant if the balances actually were repaid every month (Gross, Souleles, 2001; Sulaiti, 2006). However, at the time of making a decision on whether to adopt a credit card, the decision is based on the customer's belief in repaying, not on the actual outcome. Therefore, the higher degree of unrealistic optimism – the stronger belief of paying off the balance at the end of each month – would cause less sensitivity to the credit card interest rate.

The credit card market has been analysed by different authors. The rigidity of the credit card interest rates is the outcome of the "irrational behaviour" of customers who do not intend to borrow on their credit card accounts but find themselves doing so anyway (Ausubel, 1991; Gross, Souleles, 2001; Sulaiti, 2006). Those customers with unrealistic optimism of their future ability to pay off open balances would tend to have weaker preferences for the card's interest rate relative to more realistic customers, and stronger preferences for credit card fees than more realistic customers (Ausubel, 1991; Yang, 2006). Also, customers with unrealistic optimism tend to be less willing to search for credit cards that offer better features than do those customers with a more realistic view to their future borrowing (Calem, 1995; Gross, Souleles, 2001). Credit card usage by consumers is radically changing the landscape of consumer behaviour, motivating them to buy more often, and promoting impulse buying (Sulaiti, 2006). A rather similar argument has been used in studies dealing with the low interest elasticity at the aggregated level, where it has been noticed that aggregate household debt does not change for several quarters after a strong monetary shock (Christiano, 1996; Gross, Souleles, 2001), whereas the sensitivity of customers to the mortgage rate is significantly higher.

Another aspect of rationality of households and their behaviour models is extreme heterogeneity in their financial holdings and financial behaviour (Livingstone, Lunt, 1992; Sanchez-Munos et al, 2008). For example, wealth distribution is extremely skewed, with a small fraction of households owning a large percentage of the total wealth (Campbell, 2006; Guiso et al, 2002). Depending on their income, wealth, demographics, risk aversion and many other factors, households make very different choices regarding issues such as consumption, savings, investments, borrowing, etc. Also, households respond differently to macroeconomic shocks, such as to changes in interest rates, house prices, the employment situation of its members, taxes and pension reforms. Aggregate data can hardly provide an adequate picture of this heterogeneity. Micro level data on household finances can therefore have substantial added value for research and policy analysis in areas relevant for central banks, including monetary policy, financial stability and payment systems. Data at the micro level explains whether debt increases are concentrated on the most vulnerable household groups, which could later entail higher risks to financial stability and/or to household consumption (Farinha, 2003, Collard, Kempson, 2005).

The borrowing behaviour of private persons can be approached differently, without any modelling restrictions. Instead of the approach where the model is tested with empirical data, there could be taken a set of very different behaviour characteristics and testing their significance on the borrowing decisions and credit behaviour. One of the early studies has been carried out by Livingstone and Lunt, collecting and analysing a wide range of different data that possess sufficient demographic, economic, psychological and situational factors for fully specifying an explanatory model of the borrowing decision (Livingston et al, 1992). The obvious limitation of those studies is typically, in most cases, a few, or a subset, of demographic, economic, psychological and situational factors, or a too homogeneous group of respondents (Collard, Kempson, 2003, Stone, 2006). According to results of these studies, indebtedness of private persons is a multi-determined behaviour, where besides the demographic, financial and economic variables, the psychological and situational variables are critically important for an overall explanation of indebtedness behaviour.

Of special attention in socio-economic studies is the risk group studies. Most of those studies have focused on low-income people (Kempson, Whiley, 1999; Bridges, Disney, 2003; Whyley, Brooker, 2004; Collard, Kempson, 2005) as people, a priori, belonging to risk-groups. While the lending to low income people may not be desirable by banks at all, it can be socially unavoidable to fulfil their very basic needs such as buying essential household items, etc. The main financial product low income people use, according to several studies, is the credit till payday, whereas the purpose of the credit is elementary, paying bills, but also buying birthday presents or even brand clothes and consumer electronics for their children to prevent their stigmatisation (Kempson et al, 1994; Whiley et al, 2004). Still, the risk group studies are not focusing only on low income people, as some empirical studies even oppose the income-based principle of risk group definition (Kalafatelis et al, 2004). There are several parameters to determine the risk groups of people threatened by financial insolvency, such as financial ratios (Lawrence, 1995), behaviour parameters (Livingstone, Lunt, 1992; Kalafatelis et al, 2004, pp. 9–12), confidence and competence parameters (Kalafatelis et al, 2004), social and family parameters (Bridges, Disney, 2003, pp. 4–9), etc. According to those findings, risk groups can be ethnical and national minorities (Kalafatelis et al, 2004, pp. 8; Kempson, 1999), families with children (Kalafatelis et al, 2004, pp. 9; Bridges, Disney, 2003, pp. 4–9), age group (Kalafatelis et al, 2004, pp. 8; Lehtinen, 2007), differences in location and neighbourhood (Collard, Kempson, 2005; Marsh, Rowlingson, 2002), education and social status (Campbell, 2006, pp. 1592–1593). One of the main indicators of risk-group people, concerning borrowing behaviour, is that they have been excluded from mainstream bank financing or prime market-like mortgage loans, credit cards, personal loans, etc., where they use mainly sub-prime market products such as home-collected loans, pawnbrokers, sale and buy-back companies, etc., and also borrowings from friends and relatives (PFRS, 2004). Although the determinants of borrowing motivation vary between different studies, none of them stress the cost of borrowing as the main

consideration (Livingstone, Lunt, 1992; Rowlingston, 1994; Collard, Kempson, 2003).

There have been very few studies which include attitude analysis in the study of financial behaviour determinants of risk groups. According to the findings of those few studies (Kalafatelis et al, 2004; Stone, Maury, 2006) the main problem of the risk group is limited knowledge of their financial obligations, or their weak financial planning or attitude problems towards the consumption. Respondents from risk groups for example have admitted that they are not good at saving, as well as that they run out of money before payday and they have some delayed payments. Results of some empirical studies oppose the common approach where the poor perfomance of risk group people, as well as their investment and savings pequliarities, are due to limited financial knowledge and poor education (Campbell, 2006, pp. 1592–1595; Weinberg, 2005, PFRS, 2004). Those studies refer to the low interest of risk group people to tackle different issues of their financial indebtedness, their rather weak knowledge of their financial rights, their limited awarenes of credit conditions stated in the credit contract.

Depending on the analytical approach used in risk group definition, it is widely considered that the relative size of risk-groups in society is approximately from 10% to 30% of the total population in developing countries (Kalafatelis et al, 2004, pp. 15; Bridges, Disney, 2003, pp. 14–16). Those people face more often a problem of over-indebtedness and credit default, which could strongly hit the overall economy (Whitley et al, 2004). In recent years financial indebtedness of risk groups has grown faster than the average indebtedness (Tudela, Young, 2005, pp. 11–14; PFRC, 2007), which would refer not only to a decrease of overall unemployment and an increase of income, but also significant changes on the supply side (Ehrmann et al, 2003). There are several countries showing initiatives to include different risk-groups to the prime credit products through the different monetary institutions (Collard, Kempson, 2005, pp. 17–18; PFRS, 2007), and showing legislative initiative for further regulation of suppliers of credit (Marsh, Rowlingson, 2002; Kalafatelis et al, 2004; PFRS, 2007).

1.1.4. Research questions and study propositions

Presented in the following subchapter are propositions based on the discussion from previous subchapters about the indebtedness of private persons, their financial behaviour in credit decisions and the interest rate influence on household borrowing, according to the first research tasks introduced above. It should be noted that the previous theoretical introduction and literature review has not covered all the aspects of the empirical findings of the current thesis. In this regard, the studies presented in the current dissertation are somehow exploratory and are not presentable only through the framework of propositions.

Even though during the period of 2000–2007 interest rates has significantly decreased and later increased (see Appendix 4) and borrowing has become affordable to many people, the low interest rate would not be enough to explain credit growth during that period. Even though there are several empirical studies refering to the strong interest rate determination (Jeanfils, 2000; Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006; Mishkin, 2007) there has been a very dynamic income growth in country which has also a strong impact to the borrowing activity. Therefore those presumptions for pure interest rate determination are not reasoned enough and following proposition would be plausable.

P1a: Low interest rates are not among the main factors of the credit growth

From a macroeconomic point of view there is concern of sustainability of credit growth, strongly induced by consumption (Coricelli et al, 2006b, pp. 20–25; Sõrg, Tuusis, 2007, pp. 255–256). Expansions of credit, permanently and excessively surpassing the sustainable level of credit, may induce asset bubbles, the overheating of the economy and a deterioration of the external trading balance. One obvious test for sustainability is, therefore, to test the relationship between credit growth and trade balance to analyse macroeconomic sustainability of the gredit growth (Sõrg, Tuusis, 2009b). The consumption influence on the credit growth is also directly related to the linearity of the tested Forward Looking Theories of Consumption parameters (Debelle et al, 2004). If the consumption which impacts the country's GDP has a strong impact on the overall credit growth, which in turn is also determined by the income proxied by GDP, then there is an obvious non-linearity in the model and tests of the Forward Looking Theories of Consumption are not applicable. A few empirical studies focusing on the consumption influence on credit growth (Duenwald et al, 2005; Coricelli et al, 2006a) have not detected any permanent influence and, therefore, the following proposition has been stated as follows.

P1b: The growth of consumption is not the main factor of the credit growth

According to several empirical studies using a similiar methodology, the overall behavioural aspects have been considered important in determining the financial behaviour of private persons (Livingstone, Lunt, 1992; Collard, Kempson, 2003, Kalafatelis et al, 2004; Stone, Maury, 2006). The empirical study of borrowing behaviour of private person brought within the chapter 2.1 consists of several behavioural situations related to borrowing behaviour and other aspects of financial behaviour. The analysis of different behavioural cases would help to determine the wider use of interest rates on decisions of private persons, where the influence of interest rates is expected by the Forward Looking Theories of Consumption (Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006) or other models of private persons' behaviour (Lawrence, 1995; Crook, 2003; Valdemarra, 2007). Even though not all behaviour

situations could directly be linked to the cost of finance or to interest rates, there were enough situations of overall cost sensitivity, as well as the aspects of rational behaviour. As the overall rationality was expected in the total sample group, the following proposition could be stated:

P1c: Financial behaviour of private persons is strongly influenced by interest rates

According to the Forward Looking Theories of Consumption, the determinants of borrowing activity are income and interest rates, where interest rate sensitivity is an empirically well-exploited methodology for testing the model (Jeanfils, 2000; Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006). Therefore, one obvious approach to define risk group behaviour is with the immunity of interest rates, whereas rational persons have interest sensitive borrowing behaviour (Calem, 1995; Gross, Souleles, 2001; Yang, 2006). Several studies on the subject of private persons' borrowing behaviour argue that a significant number of private persons belong to the risk group, having low knowledge, education or participation (Campbell, 2006; Weinberg, 2005, PFRS, 2004), or desperately low income inducing a high dependency on consumption (Bridges, Disney, 2003, pp. 15–17; Whyley, Brooker, 2004; Collard, Kempson, 2005, pp. 10–12), or irrationality and wrong expectations (Calem, 1995; Gross, Souleles, 2001; Rinaldi, Sanchis-Arellano, 2006, pp. 28–29; Bianci, 2009). Empirical studies have shown that certain groups of people in society belong to the risk groups, where in developing countries 10% to 30% of people belong to the risk groups (Kalafatelis et al, 2004, pp. 15; Bridges, Disney, 2003, pp. 14–16). Therefore, there are several *ad hoc* approaches to assigning the risk groups as low income people, young people, national and ethnic minorities, people living in peripheries or people who have stressed disturbed connections. Few empirical studies have found the overall behaviour or financial behaviour of private persons as the reason for belonging to a risk-group, where behavioural characteristics determine wholly or partially the financial success or failure of private persons (Livingstone, Lunt, 1992; Kalafatelis et al, 2004, pp 9–12; Tuusis, 2010, pp. 128–129). Based on the above-mentioned argumentation, the one obvious criterion for risk-group behaviour is the interest rate sensitivity, which has been taken as the criteria for risk-group people. All major *ad hoc* risk groups are tested in the study through the interest rate sensitivity. Beside the *ad hoc* criterias for risk group determination several aspects of borrowing behaviour and attitudes were also analyzed. The proposition based on risk group's discussions in previous studies would be as follows.

P1d: Risk groups are determined by attitudes and financial behaviour

1.2. Interest rate influence on investment decisions of companies

The relationship between the financial side of an economy and its influence on the behaviour of companies has been debated since the beginning of the 20th century, but considerable studies of modelling the behaviour of companies responding to the monetary policy of a country have started with works of Modigliani and Miller. According to their assumptions of perfect capital markets, the financing decisions are irrelevant for investment decisions of companies (Modigliani, Miller, 1958). The concept of rational behaviour of companies has been presented through the shareholders' value maximization, which to some extent will be discussed more deeply in the next chapter of the current dissertation in the context of pricing objectives. The first part of the current chapter analyses the traditional investment theory, based on the shareholders' value maximization concept. There are several further developments of this traditional model of investment behaviour of a company as to the influence of liquidity constraints to investment decisions of companies. Models with liquidity constraints will be analysed in the second subsection. The third subsection of this chapter defines study propositions.

1.2.1. Traditional investment theory of a company

The core concept of traditional investment theory of the company could be stated as concluded by M. Miller and F. Modigliani (1958), "Shareholders will require the rate of return on new projects to be greater than the opportunity cost of the funds supplied by them and bondholders" (Modigliani, Miller, 1958, pp. 418). The concept itself has employed the required rate of return of investments and weighted cost of capital of companies, which create the framework of investment management decisions of companies. The framework of the investment behaviour model of companies has, since then, widened the scope of possible variables, but the basics have remained the same. The following brief outline of the investment model, which combines the most influential discussed variables, is extensively used in different studies and as well is compulsory for many economic textbooks. A simple production function of a company with two economic variables – labour L and capital K – can be expressed as follows.

$$Y_t = (aK_t^{\sigma} + bL_t^{\sigma})^{1/\sigma}$$

where $0 < a,b < 1$ and $\sigma \leq 1$. Let $c^K{}_t$ denote the cost of capital of a company in the period t, and $c^L{}_t$ the cost of labour; then the profit function would be

$$\pi_t(c_t^K, c_t^L) = Y_t - c_t^K K_t - c_t^L L_t$$

and the company's optimal amount of capital K^* at period t would be seen in the FOC as follows

$$a\left(\frac{Y_t}{K_t^*}\right)^{1-\sigma} = c_t^K$$

Based on this formula the cost of capital influence on optimal capital becomes obvious, where the cost of capital influence on the optimal capital, *ceteris paribus*, would be as follows

$$\Delta \ln K_t = \eta + \lambda\left[\ln\left(\frac{p_t Q_t}{K_t}\right) - \left(\frac{1}{1-\sigma}\right)\ln c_t^K\right]$$

The parameter λ can be interpreted as the speed of adjustment to the desired level of capital, whereas $0 < \lambda < 1$ and $1/(1-\sigma)$ are the long-run elasticities of capital, with respect to the cost of capital of a company. The formula, in logarithmic form, makes it easy to use in empirical studies and it has been used in several empirical studies to determine the investment variables and study the influence of cost of capital to investments. There has been done empirical regression analysis of the interest rate as one determinant of investment activity (Bernake, Blinder, 1988; Oliner et al, 1995), but also regression analysis of a large panel of company specific data, combined with bank lending rates (Guiso et al, 2002; Gilshrist, Zakrajsek, 2007). In general, they state that changes in the components of cost of capital, interest rates and corporate income tax, play a very modest role as determinants of investment activity in time-series models.

Another approach to the formula would be to strictly analyse investment determinants where the cost of capital framework behind it remains the same. The gross investment I_t in period t can be described as the sum of weighted average of past changes in desired capital

$$I_t = \sum_{s=0}^{\infty} \mu_s \Delta K_{t-s}^*$$

where μ_s is the proportion of the change in desired capital in the period t-s. Rewriting the formula as follows

$$I_t = \mu_0 \Delta K_t^* + \mu_1 \Delta K_{t-1}^* - wI_{t-1}$$

where

$$\Delta K_t^* = K_t^* - K_{t-1}^*$$

would lead to the following formula (replacing K^* from previous formulas) given in the form of a regression test of the empirical data

$$I_t = \alpha_1 \mu_0 \frac{p_t Q_t}{c_t^K} + \alpha_2 w I_{t-1} + \varepsilon_t$$

Investments in period t depend on the capital stock at the beginning of the period and changes in the desired level of capital stock in previous periods. The capital stock depends on the value of the output, the cost of the capital and the elasticity of output with respect to capital inputs. The formula can be further developed including the characteristics of the business and economic environment as taxes on profit and capital taxes, if any, tax credit rate allowed in investment expenditures, the time-varying rate of fixed capital depreciation[9], as well as including the expectation of companies about the future interest rates and price level (Gilchrist, Zakrajsek, 2007, pp. 3; Love, 2008, pp. 13).

This above-presented framework is actively used in several empirical studies to relate investment behaviour to the cost of capital fluctuations. There are studies exploiting the cointegration relationship to identify the long-run effect of the cost of capital to investments (Caballero, 1994; Tevlin, Whealan, 2003; Schaller, 2006), where the fact that the relative price of capital goods is non-stationary is used. There are studies combining long-run time-series analysis with firm-level panel data estimation models to find the elasticity of cost of capital of investments (Chirinko, 2004). This approach helps to obtain industry-specific data and, therefore, is not biased towards the different taxation and depreciation principles in different industries. Several studies focus on cost of capital only through the taxation episodes, where tax changes are comparatively large and have a significant influence on the cost of capital (Cummins et al, 1994; House et al, 2006). A similar episode approach would be to analyse the interest rate influence on investment decisions through episodes where there is an obvious failure of the Q-theory, based on stock market information (Philippon, 2007; Comin, Philippon, 2005). Whereas the original model allows for the study of investment activity related to a rather big set of financial indicators of different companies and industries, the application of the model depends on the structure of available empirical data. Within these analyses the proper calibration of a testable model and selection of appropriate variables should be done.

[9] As the model was derived to capture investment analysis of US companies in the 60's, the taxation part is calibrated with country-specific taxation legislation parameters. See for further discussion Hall, Jorgenson (1967)

A similar methodology, using macro-level data, is used to test the uncertainty influence on investments, where instead of the cost of capital variable the volatility of cost of capital variable is used. A negative influence of macroeconomic uncertainty to investments has been found (Federer, 1993). Based on similar methodology, a negative effect of real exchange rate uncertainty on investments in five OECD countries has been found (Darby et al, 1998); a significant negative relationship between real exchange rate volatility and investments in both developing and developed countries has been found (Pindyck et al, 1993). Later studies have also found a significantly negative relationship between several economic instability and uncertainty measures (including different measures of uncertainty in real exchange rates, inflation, capital-flows, etc.) and investments (Moguillansky, 2002; Serven, 1998; Aizenman et al, 1999). As the financial market development is considered, there are studies stating that higher investments in an economy can be achieved through the possibilities for further risk diversification, and also through a lower overall macroeconomic volatility (Love, 2001, pp. 18–20). The study concludes that financial market development helps wealth creation through the possibilities of risk diversification which, in turn, increases investments and reduces investment risks and volatility.

1.2.2. The investment theory of a liquidity constrained company

There are several methods to model investment behaviour of liquidity constrained companies. The current study follows closely the model of marginal product of capital (see. e.g. Fazzari et al, 1988; Hall, Jorgenson 1967; Gilchrist, Himmelberg, 1998). In this model the sensitivity of investments to the usage of external funds is interpreted as evidence of the existence of financing constraints. The model is based on the framework that the existence of agency costs or asymmetric information makes the sources of external finance more costly than internal sources, and companies are constrained on the weak form of constraint.

Let's assume that the production function is dependent only on the physical capital K_t[10]. Then, the profit of company through the earnings function of the company Π and adjustment cost function C, including the amount of capital and additional investments, could be seen as follows

$$\Pi(K_t) - C(I_t, K_t)$$

[10] There are several approaches to model the behaviour of a weakly constrained company where the knowledge capital, external shock influences (Gilchrist, Himmelberg et al, 1998) and working capital variables (Hall, 1995) are used. Formally including debt into the problem results in a separate Euler equation for debt; see for more details Gilchrist, Himmelberg (1998).

where I_t would indicate the investment in the physical capital in the period of t. Let us also assume that the external financial premium rp_t should be paid above the market interest rate r_t, where $\partial rp/\partial B > 0$ (when companies are increasing their indebtedness, the higher risk premium is required). The risk premium is also dependent on economic shocks, which makes the model useful in fluctuating economic environments. The optimisation problem is expressed through dividend maximization to the owners, according to the following

$$V(K_t, B_t) = \max D_t + E\sum_{s=1}^{\infty}\left(\prod_{k=1}^{s}(1+r_{t+k})^{-1}\right)D_{t+s}$$

where dividends can be expressed

$$D_t = \Pi(K_t) - C(I_t, K_t) - I_t + B_{t+1} - (1+r_t)(1+rp(B_t, K_t))B_t$$

and the constraint for capital expenditure would be

$$K_{t+1} = (1-\delta)K_t + I_t$$

Here the B_t stands for the net financial liabilities of the company. The explanation for the constraint would be that the capital stock at the period K_{t+1} would be depreciated to capital stock K_t at the period t, where δ stands for the depreciation ratio and investments I_t are made in period t.

To see now the effect of financial friction, let λ_t be the Lagrange multiplier for the constraint of dividends. The multiplier can be economically interpreted as the "shadow cost" of internally generated funds, indicating the cost using funds for investments, instead of paying dividends. These "shadow costs" determine the company's optimal investment decisions as well as optimal borrowing, according to the two following formulas. Using the Euler equation for dividends and Lagrangian multipliers, the FOC for "shadow costs" (determining marginal adjustment cost of investments) would be

$$\frac{\partial C(I_t, K_t)}{\partial I_t} = E_t\left\{\frac{1}{1+r_t}\left(\frac{1+\lambda_{t+1}}{1+\lambda_t}\right)\left[\frac{\partial D_{t+1}}{\partial K_{t+1}} + (1-\delta)\left(1 + \frac{\partial C(I_{t+1}, K_{t+1}}{\partial I_{t+1}}\right)\right] - 1\right\}$$

Here, $\partial C/\partial I$ is the marginal adjustment cost of investment, $\partial D/\partial K$ is the marginal "profit" of capital, further referred as *MPK* (the contribution of an extra unit of capital to the company's dividends), and $\Theta_t = (1+\lambda_{t+1}/1+\lambda_t)$ is the relative shadow cost of external finance in periods t and $t + 1$. Here, the factor Θ_t notes "financing constraints". The intuition behind this Euler equation is that the marginal cost of investing today, on the left hand side (given by the adjustment cost and the price of investment goods, normalized to one), is equal to the discounted marginal cost of postponing investment until tomorrow, on the right hand side. The right hand side of the formula is equal to the sum of the

foregone marginal benefit of an extra unit in capital, given by *MPK*, plus the adjustment cost and price of investment tomorrow (again normalized to one).

Using the Euler equation for dividends and Lagrangian multipliers, the FOC for borrowing costs (determining marginal adjustment cost of debt) would be

$$\frac{\partial D(B_t)}{\partial B_t} = E\left[\frac{1+\lambda_{t+1}}{1+\lambda_t}\left(1+rp_{t+1}+\frac{\partial rp_{t+1}}{\partial B_{t+1}}B_{t+1}\right)-1\right]$$

Here, $\partial D/\partial B$ is the marginal adjustment cost of debt and, similarly $\Theta_t = (1+\lambda_{t+1}/1+\lambda_t)$, is the relative shadow cost of external finance in periods t and $t + 1$, noted as "financing constraints". The economic explanation of this equation is that the marginal cost of borrowing today is determined on one hand by the financing constraint and, on other hand, by tomorrow's risk premium of tomorrow's debt.

Let's also analyze the factor $\Theta_t = (1+\lambda_{t+1}/1+\lambda_t)$, which is the relative shadow cost of external finance in periods t and $t + 1$. In case of perfect capital markets $\lambda_{t+1} = \lambda_t = 0$ for all t, and hence $\Theta_t = 1$, and the firm is never constrained, where the marginal adjustment cost of investment is rather identical to the formula for marginal adjustment cost of capital shown in the previous sub-chapter. If the shadow cost of external funds is higher in period t than is expected to be in period $t+1$ (i.e. $\lambda_{t+1}<\lambda_t$), then $\Theta_t < 1$, and it acts as an additional discount factor. Therefore, it induces companies to postpone or reduce its investment where Θ_t is the (degree of) financing constraints. If the shadow costs are expected to be the same in the next period, or $\lambda_{t+1} = \lambda_t$ (the situation of steady state in business environment), then the optimal borrowing amount for the company would be zero. It is easy to show that the maximation would require $(\partial rp/\partial B)B + rp = 0$. Since $\partial rp/\partial B \rangle 0$ and $rp \rangle 0$ (if $B \rangle 0$), therefore $B = 0$. Therefore, λ_t is time-varying and could be identified with some testable firm characteristics.

There are several empirical studies focusing on the liquidity constraint issues at the company level as well as in the aggregated level of macroeconomic indicators. As a proxy for the internal funds the stock of liquid assets, specifically stock of cash and marketable securities scaled by total assets, could be used (Blanchard et al, 1994; Opler et al., 1999; Love, 2001). The cash stock has an intuitive interpretation as "cash on hand" those firms can use for investment if the opportunities arrive. One theoretical justification for the cash stock measure appears in the model, where the amount of cash holdings has a direct effect on investment in the presence of asymmetric information. Those resources allow firms to undertake positive NPV projects, which they would pass on if they do not have any internal funds. This implies that if external financing is costly, there will be a positive relationship between investment and cash stock. Unlike the cash flow measure, the cash stock would proxy the future growth opportunities only in the presence of financing constraints. That is, firms that expect high investment in the future would accumulate a cash stock to use when the opportunities arrive. Since holding cash is costly to the firms (because

it diverts resources from the productive use and offers zero return), the firms will accumulate a cash stock only if they expect to be financially constrained in the future. Therefore, firms hold liquid assets to ensure that they can keep investing when outside funds are expensive and the companies that have a lower cost of external financing (large in size, paying dividends, and companies with high credit ratings) hold smaller stocks of liquid assets. A similar explanation is for some other proxies for internal funds such as the trade credits and overdrafts (Nielsen, 1999; Kohler et al, 2000; Valdemarra, Kaufmann, 2004; Riddiough, Wu, 2009), relations with banks (Elsas, Krahnen, 1998; Valdemarra, Kaufmann, 2004), invoice receivables and delayed payments (Cungu et al, 2008), etc. It should be also mentioned that there are some empirical studies where findings contradict the cash-flow sensitivity of investments in cases of liquidity constrained companies (Kaplan et al, 1997; Clearly, 1999). According to those empirical studies, the less constrained companies are explicitly using the internal cash-flow, whereas the more constrained companies are not so eager to use internal resources for investments. Even though there is not a clear explanation for this, few hypotheses for precautionary financial management in certain economic environments could be done. As an example, managers' temptations to overinvest in the availability of free cash-flow can be stated (Love, 2001). Therefore, the proxy for constraints should be carefully studied to avoid the critique and later misinterpretation of constraint variable. Another widely used approach analysing liquidity constraints of companies is to analyse investment sensitivity to the cash-flow, reflecting the wedge between the cost of external and internal funds of usage (Fazzari et al, 1988; Hennessey et al, 2007; Clearly et al, 2007). There are also several studies focusing on the analysis of dividend policy and investment behaviour of companies where liquidity constraints are proxied by the dividend payout ratio (Kaplan et al, 1997; Elston, 1999; Fama, French, 2002; Hardin, Hill, 2008; Riddiough, Wu, 2009), even though there are some studies arguing against that approach (Ghosh, Sirmans, 2006).

The macro-level empirical studies use several different approaches to analyse the liquidity constraints influence on investment activity, and mainly utilise the impact of monetary policy changes. The most used liquidity constrained investment model in macro-level studies is the financial accelerator model, where the interest rate has an enormous effect on investments through the influence of the net value of the company which, in turn, increase creditability of companies and has been considered the basic criteria in overall borrowing activity (Hubbard et al, 1994; Mishkin, 1996, pp. 8–18; Mojon, 2000, pp. 16–21; Wesche, 2000; Ireland, 2005, pp 5–6). Therefore, the investment activity of companies due to the influence of changing monetary policy of a country would indicate the existence of a liquidity constraints effect of companies, where the balance sheet structure of companies (as well as households) should be considered. Whereas the analysis of macro-data often do not distinguish the influence on the companies from the influence on private persons, the combined results of monetary transmission mechanisms will be discussed in further chapters of the dissertation.

There are a few studies analysing investment determinants in transition economies (Jong et al, 2000; Hartarska, 2001; Masso, 2002; Mickiewicz et al, 2004; Konings et al, 2004; Gugler et al, 2007) or developing countries (Söderbom et al, 2002; Fafschamps et al, 2002). According to those studies the cash-flow sensitivity is not so obvious, by explaining investment activity due to unreliability of data, the importance of other determinants, or specific development features of the financial system of a country. Other studies argue that the wide variety of different companies, including start-ups, privatised companies, subsidiaries of foreign companies, etc., make the study extremely sensitive to the selection of data and interpretation of empirical findings (Gugler et al, 2007). There has been found a diminishing sensitivity of investments over cash-flow in a transition country, which could be explained by an improving capital structure of companies, reducing the moral hazard problem as well as development of financial institutions (Oks, 2001; Ehrmann et al, 2003). There are some empirical studies analysing financial development and the growth of companies and economy (Demirguc-Kunt, Levine, 1998; Wurgler, 2000; Love, 2001; Listra, 2004), using the framework of financially constrained companies. Those studies examine the fastest growing countries and sectors and find the causality between the growth of a company and financial development proxied by variables indicating the lower financial constraints of companies.

The final part of this subchapter briefly discusses the inventory investment determinants, where the interest rate influences is on focus. The amount of inventory is dependent on several factors, such as the buffer stock for unanticipated expansion management by the Buffer Stock Model, inventories for smooth production by the Economic Order Quantity Model, speculative factors, etc., where the interest rate influence has an impact through the alternative cost approach. Empirical studies refer to combined models derived from several motivations of companies to invest in their inventories, whereas the marginal unit cost of inventory holdings is assumed to be U-shaped (Mehar, Muhammad, 2002, pp. 5–10), influenced by the alternative costs of interest (Mehar, Muhammad, 2002, pp. 6), as well as shrinking costs (Kok et al, 2008, pp. 8–10). There are several empirical studies at the macro-level which refer the interest rate influence on inventory investments on the aggregate level (Domowitz et al, 2001, pp. 14–15) or at the industry level (Barth, Ramey, 2000, pp. 29).

1.2.3. Research questions and study propositions

In the following subchapter are presented propositions based on discussions of previous subchapters about the interest rate influence on the investment behaviour of companies through the management of cost of capital. The models introduced above as well as the empirical findings from different studies have not covered all the aspects of empirical findings of the current thesis. Whereas the current dissertation is also exploratory on the nature, there are some additional findings to the following study propositions discussed in the conclusion part of the current dissertation.

According to the classical and neoclassical investment theory of the company, investments that companies are implementing are strongly motivated by a favorable interest rate through the influence of the cost of capital. Several other determinants would also influence the cost of capital of the company similarly to the interest rate. Some of these are more discussed in literature as the corporate income tax (Cummins et al, 1994; House et al, 2006), or inflation (Fazzari et al, 1987; Serven, 1998; Aizenman et al, 1999; Gilchrist, Zakrajsek, 2007). Several empirical studies state the influence of cost of capital on investment decisions (Caballero, 1994; Tevlin, Whealan, 2003; Schaller, 2006); some studies rate determinants of investment decisions based on their influence on investment decisions (Bernake, Blinder, 1988; Oliner et al, 1995; Gilshrist et al, 2008). Those more important determinants influencing investment decisions of companies may, in turn, be interest sensitive and, therefore, explain the results of empirical findings of the interest rate influence on investment decisions (Blanchard et al, 1994; Opler et al., 1999; Love, 2001). Recent empirical studies that distinguish the direct interest rate influence on investment and other indirect influences have found a rather mild, or nonexistence, of a direct interest rate influence on investment decisions (Bernake, Blinder, 1988; Oliner et al, 1995; Love, 2001; Tevlin, Whealan, 2003; Schaller, 2006). There are even a few studies which have found the opposite correlation between the interest rate and investments (Guiso et al, 2002). Based on those comparative empirical arguments, the proposition about the interest rate and cost of capital determinants within investment influencing determinants would be as follows.

P2a: Cost of capital determinants has not strong influence to investment decisions

Different to the previous studies, the empirical study presented in the chapter 2.2 analyzes the wider influence of cost of capital to the management of companies. Based on the previous proposition, the importance of cost of capital determinants is rather low, so then the question remains on the overall importance of the cost of capital framework. There is a strong expectation of the interest sensitivity of investment on most of the investment decision models (Hall, Jorgenson, 1967; Gilchrist, Zakrajsek, 2007; Love, 2008) as well as several empirical papers which outline the findings of a mild interest rate sensitivity (Tevlin, Whealan, 2003; Schaller, 2006). As previously mentioned, there are some empirical studies using the same methodology, stating the low level of overall importance of interest rate influence, and question the use of the cost of capital approach on investment analysis (Wilkes et al, 1996, pp. 62–63; Bopkin, Onumah, 2009, pp. 139–140). Even though there are contradictory findings on different empirical studies about the cost of capital influence on investments, the proposition for the importance of cost of capital would be:

P2b: Cost of capital framework is the main concept used in the financial management of companies

One of those determinants that is interest rate dependent, and may influence investment decisions of companies, is the liquidity constraint of companies (Fazzari et al, 1988; Gilchrist, Himmelberg, 1998). There are several approaches to model liquidity constraints using different data. The current study uses the internal finance approach which states the investment dependency on the existence of internal funds of the investing companies (see e.g. Nielsen, 1999; Kohler et al, 2000). Based on the internal finance approach the high use of free cash flow on investments, a low dividend payout ratio, and overdraft facilities from banks are used in tests to analyze the liquidity constraints of companies. Here it should be recalled that there are some empirical papers questioning the free cash flow usage to proxy the existence of a liquidity constraints problem in companies (Kaplan et al, 1997; Clearly, 1999). Still, the proposition for the existence of liquidity constraints in Estonian companies would be as follows.

P2c: Liquidity constraints have strong influence to investment decisions of companies

1.3. Interest rate influence on pricing decisions of companies

1.3.1. Pricing objectives and pricing methods

Pricing is considered the most efficient response to changes in the business environment (Nagle, Holden, 1995, pp. 12–15). Therefore, it would be plausable to assume that changes in input prices should have a reflection in pricing procedures as well as directly in output prices[11]. Many empirical studies indicate that managers routinely set prices too low, diminishing considerably their companies' profit (Hoch et al, 1994; Kopalle et al, 1999; Urbany, 2001b, pp. 26–27), or the real price changes are not adequate for changes in input prices (Keil et al, 1999; Reibstein, 1999). Most of academic empirical studies distinguish the pricing objective and pricing method (Carson et al, 1998; Guilding et al, 2005, pp. 125–127; Hunt, 2002; Lere 2000; Avlonitis, Indounas, 2005, pp. 48–49), where other empirical studies would just quote suboptimal pricing as a hysteresis of pricing (Keil et al, 1999; Reibstein, 1999; Urbany, 2001b, pp. 26; Davidson, Simonetto, 2005, pp. 26; Bechwati, Xia, 2003) without specifying pricing objectives of companies. There are several theoretical studies, as well as empirical papers, explaining short-term suboptimal pricing as a rational assessment of turnover and costs in making price changes (Lichtenstein, Janiszewski, 1999; Diaz, 2006), fairness of pricing (Urbany, 2001a; Herrmann et al, 2007), to maintain customer loyality and expectations (Baltas, 1997; Allen, Maybin, 2004; Herrmann et al, 2007), pricing image and gross-elasticity of the entire

[11] For theoretical discussion see Nagle et al, 1995

product range (Baltas, 1997), social goals of companies (Keil et al, 1999), etc. In the current dissertation the distinguished approach is used, where the objectives of pricing and methods of pricing are distinguished. The study is limited to a small and medium-sized company (SME's) focus, which has a different theoretical (Nagle, Holden, 1995; Lichtenstein, Janiszewski, 1999; Subrahmanyan, 2000; Palegeo, 2004) as well as methodological (Grant et al, 2001; Allen, Maybin, 2004) approach to the subject. Pricing behaviour of companies with strong market-domination, as well as pricing of monopolies, is explicitly excluded in the theoretical part as well as in the empirical part of the current thesis.

The pricing objective provides the direction, or the purpose, of the pricing decision (Diamantopoulos, 1991) which in turn is an extremely complex multidisciplinary process involving production, finance, legal and marketing considerations (Diaz, 2006, pp. 216). Most of the studies that distinguish the pricing objective from the pricing method argue that the main objective for the pricing is profit maximation (Carson et al, 1998; Urbany, 2001; Hunt, 2002; Lere 2000; Avlonitis, Indounas, 2005, pp. 57), however, this objective has been found to be too long-term and narrow to guide the pricing decisions of companies (Avlonitis, Indounas, 2005, pp. 50–52; Guilding et al, 2005, pp. 132–134; Diaz, 2006). To explain the use of different pricing methods there has to be other pricing objectives, such as sale maximation, market share maximation, coverage of existing production capacity, maintanance of existing customers, price stability in the market, discouragement of new entry companies, to provide "fair" prices for customers, etc. (Diamantopoulos, 1991; Drake, Llewellyn, 1995; Mitra, Capella, 1997; Meidan, 1996; Urbany, 2001b; Hoffman et al, 2002; Guilding et al, 2005, pp. 132–134). The existence of various multiple pricing strategies could create the situation where companies would have rather mixed pricing objectives, where not all are even compatible with each other (Diamantopoulos, 1991; Mitra, Capella, 1997; Keil et al, 2001). The objective of sale maximation, for example, could lead to lower profit (Meidan, 1996). Those cases have been explained in several ways as the misinterpretation of managers who rather tend to focus on enlargement, than on the profitability of the company (Urbany, 2001a), the different time perspectives of different strategies (Diamantopoulos, 1991; Carson et al, 2005), limited information and lack of communication within the company (Bagozzi et al, 1998), etc. Also, several empirical studies quote that some industries have different objectives for pricing (Diamantopulus, 1991; Guilding et al, 2005, pp. 127–129), or different companies within the same industry have different pricing objectives (Carson et al, 1998). The pricing objectives can be qualitative and quantitative (Diamantopulus, 1991). Quantitative objectives such as profit, market share, and target sales volume are easy to measure whearas qualitative objectives such as satisfation of customers, or strenghtening the relationship, are measured indirectly or evaluated through client questionnaires.

There are very few empirical studies on the distinguished pricing objective and pricing method approach focusing on pricing objectives of companies.

Those few studies, despite the long citation of mixed and multiple lists of possible pricing objectives, state that the most common pricing objective is profit maximation or achiving the required level of profit (Meidan, 1996; Carson et al, 1998; Guilding et al, 2005, pp. 125–127). Several other empirical studies outlining the profit maximation objective state the importance of proper estimation of elasticity of demand in the pricing strategy and pricing objective (Lichtenstein, Janiszewski, 1999; Davidson, Simonetto, 2005, pp. 27–29; Diaz, 2006) where some studies stress the importance of the consumer interpretation of price in the context of pricing strategy (Allen, Maybin, 2004; Diaz, 2006; Herrmann et al, 2007). A number of studies consider profit maximation as a too narrow minded objective of pricing, which is more common for SMEs. An explanation of the limited pricing objective is explained by the limited use of knowledge and management capacity (Paleologo, 2004; Diaz, 2006), the need for reliable data for decision making (Urbany, 2000a; Avlonitis, Indounas, 2005, pp. 57), cost consideration as the philosophy of enterpreneurship (Carson et al, 1998) or a highly competitive business environment with low entry and exit barriers (Kohli, Jaworski, 1990; Diamantopulus, 1991; Guilding et al, 2005, pp. 127).

1.3.2. The cost-plus pricing method

Whereas the pricing objective sets the target for pricing, the pricing method consists of explicit steps or procedures which companies use to set prices. A common empirical finding is that the most used pricing method is the cost-plus method (Morris, Fueller, 1989; Carson et al., 1998; Paleologo, 2004; Avlonitis, Indounas, 2005; Guilding et al, 2005, pp. 125–127), which strongly dominates the demand based pricing methods, competition-based pricing method or other cost based pricing methods. These studies stress the simplicity and ease of use as the main argument of the cost-plus method's popularity (Urbany, 2000a; Paleologo, 2004; Avlonitis, Indounas, 2005, pp. 52; Diaz, 2006, pp. 220), as well as the implementation of profit maximising strategy (Avlonitis, Indounas, 2005, pp. 52–53). The cost-plus method itself has a very straightforward influence on prices – the cost increase induces the price increase (Avlonitis, Indounas, 2005, pp 52; Lucas, 2003; Pasura, Ryals, 2005, pp. 47; Guilding et al, 2005, pp. 125–127), where the cost-plus method is treated as the method of covering costs in a price setting procedure (Guilding et al, 2005; Lere, 2000; Carson et al, 1998) through which the required profit level is achieved. Several empirical studies state that the use of the cost-plus method is not determined by the size of a company (Guilding et al, 2005, pp. 128), which could be naturally assumed, as bigger companies have better knowledge, more info and more resources. Studies have found that the use of cost-plus pricing is dependent on industries (Guilding et al, 2005, pp. 129–131; Diaz, 2006, pp. 214–216).

An example of the cost-plus pricing management is the activity-based costing and the pricing based on it. Taking into consideration the small size,

transparent and easy management structure and customer-oriented marketing, it would be easy to understand the high popularity of activity-based cost management practices in SMEs (see Ness, Walker, 1995; Chenhall, Langfield-Smith, 1998; Lere, 2000; Brierly et al, 2001) where, due to the high customisation rate, several side-products are offered together with the main product of the company. Even though the implementation and day-to-day management of activity-based costing is more challenging than the traditional cost management, there are still many common approaches to these two cost-management methods. The similiarities of these methods become more obvious in the case of simple business operations in low value-adding companies, where the cost-management looks almost similiar (Lere, 2000; Brierly et al, 2001). While traditional cost management divides costs into variable and fixed categories, activity-based costing divides these same costs into groups of unit-level activities, batch-level activities, product-level activities and facility-level costs. Those facility-level costs would include, traditionally, depreciation, interest rates, property taxes and insurances as well as other costs related to facilities. Those costs behave like and are treated like costs which are categorised as fixed costs under the traditional cost management approach. Therefore, interest costs should be treated in a rather similiar way in SME's, despite the use of activity based costing management or traditional cost management.

The dominance of the cost-plus method in results of empirical studies does not correspond to the findings of other empirical studies of the dominance of profit maximation as the prevailing pricing objective. First, most of the studies in that field use questionnaire methodology to analyse pricing methods used in companies, where the answers of a single company are pooled to the data set for making conclusions (Carsson et al, 1998; Guilding et al, 2005; Avlonitis, Indounas, 2005; Diaz, 2006; Herrmann et al, 2007). According to this method, the input prices and costs cannot ultimately be aggregated due to the company-specific data, and the pricing of a single company is foremost dependent on the unique set of input prices and cost structure. Second, there are some studies analysing the cost influence on pricing based on an aggregated data set, where correlations between variables are tested (Ness, Walker, 1995). Even if the industry-specific cost structure is considered, there is still a significant variance within the industry between the single company and the average company in the industry. Therefore, the increase in costs is a very company-specific variable, even in the case of aggregated cost-price fluctuations. The increase of the price in a highly competitive environment, where SMEs are operating, the response of a unique cost increase seems to be rather contradictory to profit maximation, according to the heightened customer focus in an increased competitive environment (Kohli, Jaworski, 1990). Also, it contradicts many papers concerning demand-based pricing and competition-based pricing as the main pricing tool of SMEs in competitive economic surroundings (Blackburn, Watkins, 1986; Hunt, 2002; Allen, Maybin, 2004).

Based on previous arguments, the simplified approach of the usage of cost-plus method in pricing should be analysed more deeply. Also the cost structure

of a company which is determined by type of industries, could have rather different influence to the pricing as described in previous studies. Despite the fact that the cost-plus method is the overhelmingly popular pricing method within SMEs, the impact of the method in pricing might be less dominant (Diaz, 2006). Taking into consideration that most of those empirical studies using quantitative methods, the qualitative approach, which is used in the empirical part of the current thesis, might create some better understanding of behaviour of pricing and could provide an explanation to those contradictions.

The literature provides some other explanation besides the difference between the high influence of the cost-plus method in pricing procedures and the final price implementation of companies. Several studies focusing on pricing and customer satisfaction state the importance of fair pricing – prices or price increases have to be justified and reasonable (Herrmann et al, 2007; Urbany, 2000a; Adams et al, 1998). Therefore, the prevalence of cost-based pricing, which is commonly considered as concrete, vivid and unambiguous, could be explained by saying that cost-plus pricing is the best pricing method to explain the price increase. It is likely, that arguments about past or current cost increases are more convenient arguments to customers to explain price increase then explanations about increased demand, etc. (Kahneman et al, 1986; Urbany, 2000a).

Besides the considerable empirical studies of price determination in closed economies, there are several studies analysing price settlements in open economies where the import prices have been considered exogeneous (Bloch, 1992; Kardasz, Stollery, 1998). Those studies explicitly indicate that import prices might be adjusted to meet local conditions in markets which are imperfectly competitive, whereas in competitive markets local prices might be adjusted. The influence of tariffs should be considered, as well as the number of industry-specific variables[12]. Both studies conclude the dependency of pass-through of costs on the type of industry.

1.3.3. Research question and essential findings from other studies

In this subchapter are summarised essential findings discussed in previous subchapters about the pricing behaviour, pricing objectives and pricing methods used in companies according to the third research task introduced above. These findings are essential to present the complexity of the pricing procedures in companies, and they represent important fundamentals about the corporate pricing procedures. Summarising the findings in the current subchapter helps to present the contradictory nature of these findings. In this part of the study, where pricing behaviour of companies is analysed, the importance of the exploratory nature of the study is highest throughout the dissertation. Through these essential findings, the study results are discussed.

[12] See for discussion of the model Dornbusch (1987)

The first essential finding on the pricing behaviour of companies focuses on the pricing objective. Most of the empirical studies distinguishing the pricing objective from the pricing method argue that the main objective for the pricing is profit maximation (Meidan, 1996; Carson et al, 1998; Guilding et al, 2005). There are also other studies arguing that the profit maximation is too narrow to guide the pricing decisions of companies and there are several other objectives companies are following in their pricing behaviour (Diamantopoulos, 1991; Drake, Llewellyn, 1995; Avlonitis, Indounas, 2005). The existence of various multiple pricing strategies could create the situation where companies quite often have rather mixed pricing objectives, where not all of them are compatible with each other (Diamantopoulos, 1991; Mitra, Capella, 1997; Keil et al, 2001). Despite the number of objectives found in different studies, there is always mentioned profit maximation, which is also compatible with the very basic assumptions of corporate finance (Varian, 1992, pp. 338–341). Therefore, the first essential finding in the pricing section would be on the pricing objectives of companies, and would be as follows.

Efa. The overall objective of pricing is the maximation of profit

Studies distinguishing the pricing objective from the pricing method, as well as empirical studies of price setting methods and techniques of SMEs, argue that the most used pricing methods are the cost-plus method (Morris, Fueller, 1989; Avlonitis, Indounas, 2005; Carson et al., 1998; Paleologo, 2004), which strongly dominates over the demand based pricing methods, competition-based pricing method and other cost based pricing methods. The high usage of the cost-plus method within the companies has even been considered as proof of the profit maximation objective of companies (Diaz, 2006). The reasons for cost-plus implemantation in SMEs are transparency, easy implementation, suitability for non-sophisticated management (Chenhall, Langfield-Smith, 1998; Lere, 2000; Brierly et al, 2001). The essential finding about the pricing method used in companies would be as follows.

Efb. The cost-plus pricing method is overhelmingly the most used pricing method within companies

Despite the fact that empirical studies overhelmingly find the dominance of the cost-plus pricing method over the other pricing methods, there are few studies arguing for the simultaneous use of multiple pricing methods (Carson et al, 1998; Avlonitis, Indounas, 2005; Diaz, 2006). Whereas the use of multiple pricing methods does not contradict the high dominance of cost-plus pricing, the multiple pricing methods could be assumed, and the proper mechanism for precise implementation of those methods should be studied. The multiple pricing methods would also cover the findings where the cost-plus pricing method fails to explain the profit-maximation principle in highly competitive industries as well as in other contradictory empirical findings of pricing method

use within SMEs (Blackburn, Watkins, 1986; Hunt, 2002; Allen, Maybin, 2004). Even though those studies state the use of several pricing methods, there is still a lack of studies presenting explanations and presenting proper mechanisms of simultaneous use of different pricing methods. Based on these considerations, it would be plausible to assume that also Estonian companies may use several pricing techniques at the same time, while the mechanism of the use of different pricing methods should be discovered.

Efc. Most of companies use several pricing techniques simultaneously

As several empirical studies have noted, the cost influence on pricing is an industry-dependent variable. There are studies arguing that the dependency of the use of the cost-plus method initiates from industry-dependent pricing objectives (Diamantopulus, 1991; Guilding et al, 2005, pp. 128–130), where other studies argue the importance of cost structure of different industries (Guilding et al, 2005), the tracable cost accounting practices (Brierly et al, 2001; Lere, 2000), or natural customisation of industies, such as different service industries (Guilding et al, 2005, pp. 131–134). Therefore, it would be natural to assume that there is an industry-dependent use of the cost-plus method where the reason for this should be studied and explained.

Efd. The usage of the cost-plus pricing method is not similar in different industries

The role of the interest rate to pricing is rather ambiguous. On one hand, there is the temptation of companies within the framework of the cost-plus pricing methodology to increase prices in line with any cost increase. Empirical studies in that field do not distinguish any particular type of cost in the context of cost-plus pricing implementation (Carson et al., 1998; Lere, 2000; Lucas, 2003; Pasura, Ryals, 2005; Guilding et al, 2005). Therefore, it could be assumed in the context of a predominant use of cost-plus pricing methods within companies that rising interest rates would have an increasing price influence. This would be in line with other parts of the current dissertation where a higher interest rate could influence, through the direct monetary transmission mechanism, aggregated demand and supply through the intentions of managers of companies to follow up actively the interest rate influence on the performance of companies[13]. On other hand, straightforward implementation of the cost-plus method in pricing would violate the profit-maximation principle of companies in the longer run (Kohli, Jaworski, 1990), and contradicts many other empirical findings of suboptimal pricing behaviour (Herrmann et al, 2007). It also contradicts findings where the efficiency of the direct monetary transmission

[13] According to the empirical study results presented in the chapter 2.3 the main focus of the interest rate management within Estonian companies is to follow financial expenditures and through that to maintain the profitability of companies

mechanism is substantially lower than the efficiency of other channels of monetary transmission mechanisms. Taking into consideration the above-mentioned different viewpoints about the possible influence of the interest rate influence on pricing, the following essential finding of the interest rate influence should be explicitly discussed in the empirical part of the dissertation.

Efe. The interest rate has direct influence to the pricing

There are few studies analysing the exchange rate influence on the pricing behaviour of companies through the influence of the import prices (Bloch, 1992; Kardasz, Stollery, 1998). The frameworks where studies are conducted, based on the cost-plus pricing methods, have a very straightforward influence on prices – the cost increase induces the price increase (Avlonitis, Indounas, 2005, pp. 52; Lucas, 2003; Pasura, Ryals, 2005, pp. 47; Guilding et al, 2005, pp. 125–127). Even though there are some considerations on the implications of the method (Lere, 2000; Brierly et al, 2001), the influence of the exchange rate on the prices could be considered as any external influence on the input prices. As Estonia is considered as one of the most open economies within the EU (Sõrg, Tuusis, 2006), the exchange rate should then have a strong influence on the pricing. Despite the trade orientation of Estonia towards the neighbouring EU countries, as well as the domination of Euro or quasi-Euro currencies in trade (Dabusinskas, 2003), there is still significant trade with countries giving currency risk exposure. Should be also recalled that most of commodities, even within the Euro-area, are quoted in USDs. Therefore, the exchange rate influence on the costs should be considerable.

Eff. The influence of exchange rate to prices is industry-dependent

1.4. Links between studies conducted

The interest rate influence on the behaviour of economic subjects has an important role in determining the efficiency of monetary policy. In the current chapter, different channels of monetary transmission mechanisms will be discussed where the focus of the discussion stays on the interest rate's role on these mechanisms. Many authors have argued that monetary policy transmission differs substantially across countries in the monetary union in Europe, which may be related to differences in financial structure as well as other country-specific items (Guiso et al., 1999; Clements et al, 2001; Amato, Gerlach, 2001; Angeloni et al, 2003; Coricelli et al, 2006a; Borio, Zhu, 2008). Therefore the different influence of interest rates on the behaviour of economic subjects could be assumed.

Besides the different efficiency of channels of the monetary transmission mechanism in different economic areas and countries, the changing efficiency of monetary policy transmission channels should be considered. The influence

of the bank lending channel within the credit channel of the monetary transmission mechanism has lost the efficiency due to the relaxing of regulation (Miles, 1992; Bayomi, 1993; Cecchetti, 1999) and the development of financial innovation (Love, 2001). In Estonia the decreasing efficiency of the exchange rate channel has been found (Sepp et al, 2004) accompanied with the growing efficiency of the interest rate channel of the monetary transmission mechanism (Angeloni et al, 2003). There are several reasons mentioned in studies of changing efficiency of the monetary transmission mechanisms, including financial innovation, the changing socio-economic environment, etc., which reduce the applicability of results over time. Within the context of the current dissertation, the changing socio-economic environment of the country should be outlined, where bigger structural changes could induce the change of behaviour of economic subjects (Bean et al., 2002; Coricelli et al, 2006b; Campbell, 2006). According to those findings, the applicability of the current dissertation results, as well as the common analysis of those findings, is justified.

Monetary policy transmission: the cost-push inflation

The explanations for the inflationary process in Estonia, especially after the enlargement of the EU, have been the uncontrolled rising of wages, price-convergence processes on production inputs and outputs, etc., which could be summarised as a strong cost-push inflationary process. The cost-push view of inflation is based on the notion that prices are set by the cost of production, and that prices increase only when costs increase. Within the framework of cost-plus pricing, different costs could be distinguished (Lere, 2000; Brierly et al, 2001) based on their impact on the cost structure of the company through the different managerial practices used in companies. Whereas the cost of inputs, raw materials, labor costs, etc., have been considered natural drivers of the price increase through the framework of cost-push inflation, the interest rate costs are rather seldomly treated through the same framework. Even though the interest rate influence on the pricing has been discussed in the previous subchapter and analysed in detail in the empirical part of the study, the current sub-chapter gives a broader discussion of the cost-plus method within the framework of the direct monetary transmission channel of the monetary transmission mechanism, as a part of the cost-push inflation.

The idea that interest rate expenses should be treated also as a cost of production has a suprisingly long history. The argument that a decrease in interest rates determines a reduction in prices via lower costs of production was already advanced in 1844 by Thomas Tooke, who was a leading scholar of the s.c. banking school[14]. The most famous version of the view that interest rates affect costs of production is expressed by U.S. Congressman W. Patman, chairman of the Joint Economic Committee, who pointed out "... the senselessness of trying to fight inflation by raising interest rates. Throwing gasoline onto the fire to put out the flames would be as logical" (Seelig, 1974, pp. 1052). Ever

[14] As a reference, see the survey by Gaiotti and Generale (2003) and Secchi (2006)

since the economic paradigm between inflation and interest rates was turned upside down, the question remains, that of, how interest rates influence the settlement of prices, and through this the inflation.

There are several approaches to model interest rate influence to prices. The monetary policy may operate in the short run through the cost channel, while in the longer run the demand channel dominates (Barth, Ramey, 2001). The study argues that monetary policy shocks affect the short-run productive capacity of the economy by shifting both the demand and supply functions in the same direction. This would cause a price level rise in the short run in response to a monetary tightening. Still, the most common approach lays on the price equality of marginal costs influencing the behavioural analysis of companies operating in competitive surroundings. Several empirical studies argue that, overhelmingly, the most popular pricing method used by SMEs in different industries and in different countries is the cost-plus method (Avlonitis, Indounas, 2005; Urbany, 2001; Lere, 2000; Guilding et al, 2005). Even if companies use, in parallel, more than one pricing method the cost-based methods are strongly prevailing ones. The common belief is that the use of the cost-plus method indicates the profit maximation objective of a company (Carson et al, 1998; Avlonitis, Indounas, 2005, pp. 52–53).

Another transmission mechanism using the cost influence from inflation, in the same direction as the direct monetary transmission channel of the monetary transmission mechanism, is the mechanism of the exchange rate channel. Low interest rates would induce lower exchange rates through the interest rate parity framework and, therefore, the prices of imported products should increase (Dabusinskas, 2003). The influence of the exchange rate channel is strongly motivated by the price behaviour of companies, which is studied in detail in the empirical part of the dissertation, including a discussion of the possible influence of the exchange rate channel to the pricing behaviour of companies. It should be noted that the structure of imported goods and the value-adding structure of industries have an impact on the pricing behaviour and, through this, on the efficiency of the exchange rate channel (Dabusinskas, 2003; Sepp et al, 2004).

Monetary policy transmission through the interest rate channel

Under the common view of the monetary transmission mechanism, changes in interest rates induce – through changes in relative prices and alternative costs – incentives to change investment, production and consumption behaviour (Bean et al., 2002; Coricelli et al, 2006a; Campbell, 2006). A decline in interest rates – beside the stimulation of production and investments – raises the price of future consumption relative to the price of current consumption and has a positive effect on the value of discounted lifetime income, providing incentives for households to spend more today. Based on several studies, the interest rates have a strong impact on the borrowing decisions (Ireland, 2004; Zhang, Sun, 2006; Coricelli et al, 2006b, pp. 6–14; Mishkin, 2007). The interest rate channel

influence on the behavior of companies is modeled through the cost of capital framework.

In several papers analysing monetary transmission mechanisms, the efficiency of the interest rate channel has been analysed through the concept of the pass-through rate (see e.g. De Bondt, 2002; Mojon, 2000; Sepp et al, 2004; Juks, 2004). Inefficiency is tested based on the following formula, where the price set by the bank, i_B equals the marginal cost of funding, approximated by a market interest rate i_M, and constant mark-up μ.

$$i_B = \mu + \beta i_M$$

The pass-through parameter β is equal to *1*, in perfect competition and complete information, and indicates high efficiency of the interest rate channel of the monetary transmission mechanism. This assessment formula has been used in several studies to measure the efficiency of the monetary transmission channel. There are also several studies arguing against the use of the interest rate pass-through as a proxy for efficiency of the interest rate channel of the monetary transmission mechanism outlining the influence of the behaviour of financial institutions to the pass-through rates (Gup, Kolari, 2005, pp. 224–260).

Monetary policy transmission through the credit channel

The pure credit channel works through the availability of monetary resources and has no direct influence on the interests of the behaviour of economic subjects. Most of the academic literature (Bernake, Blinder, 1988; Mishkin, 1996; Detken, 2004; Coricelli et al, 2006b) sees the credit channel, from the banks' perspective, as the ability to lend – bank lending channel – or from the borrowers' perspective as their ability to borrow – balance sheet channel or accelerator channel.

The dependency of interest rate premium (and overall possibility to acquire credits) is referred in the literature as the balance-sheet (sub-) channel, within the framework of the credit channel of the monetary transmission mechanism. Due to asymmetric information problems and moral hazard, the borrowers' ability to get loans is restricted by their estimated net worth, which is often simply the collateral used for the credit, such as real estate. Interest rate changes affect the net worth, and thereby credit constraints, of a firm or an individual by directly affecting interest rate expenses and by altering the value of some assets on their balance sheets (real estate, equity, securities, etc.). Recent empirical studies of the balance sheet structure of households and firms and direct questionnaires of their behavioural motives enables the comparison of the combined magnitude of the income effect and wealth effect of a change in the monetary market rate, where the distinguished influence of the magnitude of each effect still remains questionable (Mojon, 2000; Campbell, 2006; Mishkin, 2007). The limitation of reliable data about the economic subjects in CEE

countries is the main reason for the limited availability of those empirical studies.

The other sub-channel of the credit channel, the bank-lending channel, is less intuitive and more controversial. The bank-lending channel works through the mechanism which forces banks to contract the supply of loans in response to a tightening monetary policy and an increase interest rates. This behaviour is the first-stage monetary transmission mechanism behaviour, where the behaviour of financial institutions is affected, and on the second stage the behaviour of economic agents through which the limited financial resources is affected. One explanation for it is the bank behaviour where important resources – sight deposits and other liquid liabilities – might contract due to higher alternative costs and lower demand for loans. Another explanation relates to bank solvency constraints – an increase in interest rates may lower banks' capital adequacy ratios due to the different maturity of assets and liabilities, through a negative impact on the price of securities held by them, and impose binding constraints on loanable funds (Markowic, 2004). It should be noted, however, that rises in interest rates provide incentives for the nonfinancial sector to save more, and this should hamper the functioning of the bank-lending channel.

Empirical studies of transition countries strongly support the existence of the credit channel as an important feature of the monetary transmission mechanism (Amato, Gerlach, 2001; Sepp et al, 2004; Ramanauskas, 2006; Detken, 2004; Juks, 2004; Cenic, 2008), whereas most of the empirical studies analyse the bank lending sub-channel of the credit channel. As the efficiency of the credit channel is dependent on several banking characteristics, there are several other banking indicators used in those empirical studies of credit channel efficiency of the monetary transmission mechanism. It has been found that banking size and liquidity are significant factors in determining loan supply (Juks, 2004; Matousek, Sarantis, 2006), whereas the capitalisation of banks is not significant.

Monetary policy transmission through the asset price channel

Monetary policy influencing asset prices of households and companies is the main essence of the asset price channel of the monetary transmission mechanism. The asset price channel in the corporate sector is mainly analysed through the influence of interest on equity prices which, in turn, influence investments. This mechanism is described through Tobin's Q-theory, where the company's Q is defined as the market value of a company as determined by its replacement cost (see e.g. Philippon, 2007; Gilchrist, Zakrajsek, 2007; Comin, Philippon, 2005). The lower interest rates would induce higher share prices, where the market capitalisation of a company is considerably higher than the net worth of the company and the company has considerable incentive to invest. The empirical papers of Tobin's Q are focusing on the investment sensitivity to stock market indicators (Gilchrist, Zakrajsek, 2007; Comin, Philippon, 2005), instead of to interest rates as on the interest rate channel, or other such fundamentals such as cash flow on the credit channel of the monetary transmission mechanism.

The private persons' behaviour is analysed through the interest rate influence on the holdings of private persons, or the wealth channel. The wealth channel framework is similar to Tobin's Q framework and is described by the life-cycle hypothesis. Private persons increase their consumption on the increase of their wealth, which could be induced by lower interest rates. In the wealth channel of the monetary transmission mechanism the influence of the housing price, as a major holding of households, is also discussed (see e.g. Bernake, Gertler, 2000; Catte et al, 2004; Mishkin, 2007; Sellin, Walentin, 2008). Several empirical studies state the increase of the housing price as the main determinant of wealth channel efficiency; it also influences transition economies (Kiss et al, 2005). Interest rates are influencing also private persons, who not only decrease their savings but also expand their financial obligations which make the explicit measurement of wealth channel efficiency rather challenging.

The asset price channel is in line with monetarist viewpoints (Meltzer, 1995; Mehrling, 2005), such that expansionary monetary policy, where the money supply is increased and liquidity exceeds the optimum level, the prices of financial and real assets will increase. Therefore, the high asset prices would be accompanied with higher consumption, higher inflation and require proper monetary policy reaction by the monetary institutions.

The risk-taking channel

Recent literature debates about the limitation of classical monetary transmission mechanisms – interest rate channel, asset price channel including exchange rate sub-channel and credit channel. Some studies introduce other types of channels to explain shortages of classical channels in explaining an increase of borrowing in the case of high interest rates. There might occur an adverse change in monetary conditions – the disincentives to invest, produce and consume may be enough to bring down the overall level of economic activity, but positive incentives owing to interest rate cuts, may not be sufficient to significantly stimulate economic activity. One of the explanations might be the risk sensitivity of economic subjects, or the risk-taking channel of the monetary transmission mechanism, defined as the impact of changes in monetary policy rates on either risk perceptions or risk-tolerance and, hence, on the degree of risk in the portfolios, on the pricing of assets and on the price and non-price terms of the extension of funding (Borio, Zhu, 2008). A few empirical studies that have been done in this field confirm at least that further analysis could be productive (see e.g. Amato, Gerlach, 2001; Borio, Zhu, 2008; Bianchi, 2009).

There are at least three ways in which risk-taking channels could be considered (see e.g. Borio, Zhu, 2008; Bianchi, 2009). First, the risk tolerance increases with wealth (Browning 1991, pp. 124; Lawrence, 1995). Lower interest rates, for instance, boost asset and collateral values as well as incomes and profits, which in turn can reduce risk perceptions and/or increase risk tolerance. The procyclical behaviour of estimates of default probabilities, where also loss is given as default, volatilities and correlations, is a concrete example

of the influence on risk perceptions. All this can encourage risk-taking behaviour of economic subjects. There are empirical findings that measured volatility declines in rising markets (Bianci, 2009); this releases risk budgets of financial firms and encourages investment in real and financial instruments.

A second set of effects operates through the relationship between market rates and target rates of return. For example, reductions in interest rates can interact with "sticky" rate-of-return targets (Dewald, 1998; Love, 2001; Wilkes et al, 1996, pp. 62–63), especially in nominal terms, so the risk-tolerance is also sticky and does not follow the interest rates by a narrowly defined route. Sticky target rates of return may reflect the nature of contracts, as with pension funds or insurance companies that have nominal liabilities at predefined long-term fixed rates, sometimes reinforced by regulation (Borio, Zhu, 2008), but they also may reflect deeper behavioural features, such as money illusion (Basak, Yan, 2009) or difficulties in adjusting expectations following periods of "exuberance" in markets (Bianci, 2009). All this suggests that the impact of this channel may be stronger when the gap between market and target rates is unusually large. Also, the effect of the channel might be significant and highly dependent on the history of background economic conditions, e.g., being larger following a period of disinflation and/or of sustained high returns on a particular asset class, and weaker otherwise.

A third set operates through the communication policies and the reaction function of the central bank. For instance, the degree of transparency and creditability about future monetary policy may affect economic subjects' decisions today and through that can influence their financial behaviour (see e.g. Mohanty, Turner, 2008). By increasing the degree of transparency or commitment accompanied by actions reduces uncertainty through which the central bank compresses risk premium.

1.5. The data, research methods and limitation of data and methods used

According to the previous subchapters the methodology of the study is rather important in order to interpret results as well as to compare findings with other empirical studies presented and cited in this dissertation. Within the current dissertation, different assumptions and theoretical considerations are closely linked to the empirical Studies; therefore the comparability of results becomes crucial in discussing findings and drawing overall conclusions. The current subchapter discusses in detail the methodology and data used in these three empirical studies included in the second part of the current dissertation.

Should be mentioned that all three empirical studies presented in the current dissertation are carried through by using direct methods of the investigation as questionnaires and semi-structured interview. Therefore the results are rather reflecting the opinion of the respondents which could difer the real motives and behaviour impulses. On other hand, the direct methods were chosen deliberately to oppose the heavy usage of indirect methods in that field. According to the author's opinion, the direct methods would also reveal better the real motives of behaviour of economic subjects then indirect methods; also the dissertation includes several citations to empirical studies using indirect research methods in theoretical part as well as in conclusion part.

For the first empirical study, analysing borrowing behaviour of households by micro-data analysis, the research focus was a behavioral analysis of Estonian private persons, to analyze motives of their credit behavior and interest rate influence on it. The idea of the study was not to analyze certain credit product groups or specific groups of people, as several previous studies have approached the credit behaviour of private persons, but to approach all final credit consumers. To draw conclusions on the wider group of people, or to the entire population, it is important to have good coverage of different age groups, good geographic coverage, different work experiences, different financial obligations and different nationalities living in Estonia (see Table 1.1). Based on the representativity of the sample group's different attitudes, their financial behaviour and determinants, is considered important, in the decision making process on borrowing, etc., and could be utilised in analysing the financial behaviour of whole population. The survey is based on structured questions conducted in the form of interviews in different places of Estonia between September and November 2008 (the questionnaire itself has been presented in the Appendix 1 of the current dissertation). The questionnaire was composed only in the Estonian language and, when necessary, was translated by interviewing persons to the respondents.

Table 1.1. General description of respondents

Data of sample group	Data about Estonia			
Total number of respondents/ total number of inhabitants:	324		1,340,415	
Male	170	52%	617,299	46%
Female	154	48%	723,116	54%
Estonians	227	70%	921,484	69%
non – Estonians	97	30%	418,931	31%
residents of capital Tallinn	75	23%	398,594	30%
residents from outside of Tallinn	248	77%	941,821	70%
Employees	214	66%	605,900	58%*
Students	14	4%	109,000	10%*
Retired	24	7%	229,437	22%*
Unemployed	19	6%	38,400	4%*
self-employed	53	16%	50,600	6%*

* The structure of labour status has been calculated based on the population aged between 15–74 (in 2008 in Estonia counted 1,042,800 people in these age groups)
Source: Statistikaamet

The questionnaire itself was divided into 5 parts. The first part consisted of general descriptive information about respondents including age, occupation, residential information, etc. The second part consisted of questions where respondents gave information about their overall indebtedness and evaluated their own indebtedness. The third part of the questionnaire analyses respondents' motives on whether to decide/postpone borrowing. The fourth part of the questionnaire was designed to evaluate respondents' overall credit behaviour, through the 8 different questions about his/her financial and behavioural preferences. Questions were presented on the form of respondents' own evaluation on his behaviour, using the Likert-type 5-level scale. The fifth part included 18 different economic behaviour dilemmas and cases where respondents had to evaluate their behaviour by using the Likert-type 5-level scale.

The questionnaire was performed in the form of interviews, which considerably increases the respondency rate and provides the possibility to operatively assist respondents in understanding and interpretation of questions, assist in translation, or even in the selection of a proper answer (it should be mentioned that the oldest respondents were 80-years old). There were several cases were respondents had two correct answers to the question (for example, some students are also part-time or even full-time employees, and many retired persons are also working part-time), where the assistance was necessary. On those occasions, the most influential answer was marked in response lists. There were also few motives for borrowing which were not included in the selection of answers, or respondents had difficulties in following the routine of the questionnaire, based on his/her financial behaviour. Even though the use of assistance could have a biased effect on the results of the questionnaire, the

respondency rate, together with necessary human assistance in a multi-page intensive questionnaire, would compensate for the shortcomings of using assistance.

For the empirical study, analysing investment management of Estonian companies, the research focus was on determinants of investment decisions of companies, including interest rate influence. For that purpose, a questionnaire to 200 of the biggest non-financial companies of the country was sent. 44 companies replied, which makes the response rate approx 22% (the average response rate of such kinds of questionnaires). The questionnaire itself also covered other parts of financial management issues of companies, whereas investment management was a part of the questionnaire. The questionnaire mainly included multiple choice questions, which would help respondents to answer, and avoids the interpretation problem of the analyser. On the other hand the limitation of such questionnaires is the closed set of "right" answers, which may distort the results of the analysis as well as providing an interpretation problem of the respondent.

The selection of target companies was chosen based on size rankings of Estonian companies, where the 200 biggest non-financial companies were chosen. Whereas the research assumption was the low use of complicated interest management tools in companies, the bigger companies were assumed to be more active in implementing sophisticated financial management methods which could include several interest management methods. The management of the cost of capital, interest risk hedging and management of capital structure needs certain skills which are affordable for rather large companies. Therefore, results that could support the use of comprehensive financial management methods within companies would be biased and, therefore, would not be directly applicable for an average Estonian company without proper explanation.

Table 1.2. The comparison of sample companies to the average Estonian company

The set of characteristics to compare average Estonian companies and sample companies	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

Source: 2nd empirical study

The limitation of use of the study results is the fact that the empirical part of the Study was carried out in 2001. As several studies point out, the determinants of behaviour of management decisions change over time (Pereira, 1991; Tudela, Young, 2005, pp. 10–14; Baltas, 1997), mainly due to the changes in the socio-

economic situation of country. Those aspects and other limitations are discussed in the conclusion part of the current dissertation.

For the empirical study, in analysing pricing behaviour and price management of Estonian companies, the research focus was on a deeper understanding of the pricing decision-making process of companies. The main goal of the empirical study was to analyse and explain the pricing procedure and pricing methods of companies, considering the empirical findings of previous empirical studies. Based on the research focus, the case-study approach, as the research method, was chosen by studying five Estonian SMEs through the semi-structured interviews. The emphasis on data interpretation has been carefully followed throughout the study. This allows interview data to be initially coded in several ways (also during the interview process), then re-analysed and interpreted as further data are gathered[15]. The further analysis of data is conducted in accordance with procedures of comparative case analysis as mentioned by Ragin (Ragin, 1994). These procedures consist of three steps. The first step is within-case analysis, conducted for each separate case to determine the direction of dependencies between studied variables on each individual case. The second step is to compare results of individual cases in order to find cause-effect dependencies between variables. The final step compares results with theoretical debates to draw some conclusions or hypothesis.

The selection of companies included in the study was based on the following criteria. First, they have to be representatives of industries with diluted concentration. On industries with dominant participants, the pricing procedures might be different than for industries with high competition. Second, the chosen companies have to identify themselves as a company acting on the competitive environment, to avoid competition distortions in which niche companies operate. Third, they have to represent different industries so as to draw conclusions on different use of pricing methods in different industries. Fourth, preferably, companies could have different cost structures, financial gearing, different currency exposures, etc. Different cost structure has been presented as an explanation to different use of pricing methods in different industries. Fifth, they should have a stable management, for at least three years, without any changes in management, strategy, any involvement in mergers and/or acquisition, or any other significant management changes. The requirement of a stable management environment enables to focus on analysis of pricing objectives of companies, and practices of pricing methods to achieve those objectives.

Case studies were carried out mainly by in-depth semi-structured interviews with managing personnel. Questionnaires have been built up to minimize possible biased answers that can be caused by the influence of the questions themselves, where managers of companies tend to adapt the mode of the recipient to their views (Carson et al, 1998). Throughout the interviews, the usage of terminology was deliberately avoided. Interviews themselves followed

[15] see for further methodology discussion Grant et al, 2001

a relatively unstructured pattern for the recipients and were limited only by time. Whereas the study was focused on contradictions of the empirical findings of previous studies and explains a possible pricing implementation framework of companies, the data consists mainly of already processed data and the few statements of the respondents. The case-study results are analysed within the current dissertation through the framework of the essential findings. Based on the previous empirical studies, seven influential empirical findings are presented which are widely used in the contemporary studies of the price management. On the other hand these empirical findings contradicting each other. The aim of the case-study analysis within the current dissertation is to analyse these empirical findings and explain in details the price management of companies.

2. EMPIRICAL STUDIES

2.1. Borrowing behaviour of households by micro-data analysis

2.1.1. Introduction

From 2000 till 2007 (2008) there has been a significant lending/borrowing explosion in Estonia in a similar pattern as in other Central and Eastern Europe countries (CEEC). During the period the borrowing of private persons grew from 8 bil EEK (500 mil EUR) up to 112 bil EEK (7.2 bil EUR). The credit boom was accompanied with the quick economic growth, with the significant increase of wages and relatively low unemployment rates. During that period interest rates had lowest levels in the recent economic history of Estonia. The period can also characterised by the gradual expansion of financial services together with relaxation of credit constraints to private persons. The credit boom itself started with mortgages and other types of secured loans and gradually spread to the unsecured financial instruments' sector like credit cards, different type of leasing and quick-credit services.

The growing financial indebtedness has become a serious problem also in developed countries where the consumer credit has grown more than reasonably. Similarly to CEEC, other European countries have also experienced the phase of low interest rates and modest economic growth accompanied with significant growth of wages. Several studies refer to the relaxed credit constraints as well as intensive development in financial market as the main reason for growing indebtedness (Love, 2001; Campbell, 2006).

The expansion of credit and growing indebtedness causes discussions among policymakers. On the one hand the lending in developing countries would be necessary to finance the development under the lack of internal savings. There has been discussed also the role of borrowing to stabilise current account deficit. On the other hand the growing personal indebtedness causes several worries in developing as well as in developed countries. The main concern has been debt repayment and possible social issues where most of these problems are associated with consumer credits (Collard, Kempson, 2005).

One important issue analysing private persons' borrowing, financial indebtedness of private persons as well as efficiency of monetary policy is the private persons' behaviour sensitivity to the interest rate. The interest rate has been considered influential variable of private persons' intertemporal behaviour even though the most recent studies are questioning the mechanism of influence of interest rates to private persons' behaviour. Most popular models of the money market or behaviour of participants in the money market include interest rate as one of the key variable to describe money market and borrowing behaviour (Modigliani, 1985; Deaton, 1992, pp. 2–43; Brueckner, 2000; Gary-Bobo, Larribeau, 2003). Still, there are several studies where interest rate

influence and borrowers' and consumers' rationality has been questioned due to the complexity of financial environment for private persons as well as strong biased expectations on future income and expenses (models of financial mismanagement).

The credit behaviour of private persons' are mainly studied on micro-level studies through the characteristics of certain credit products as credit cards, mortgage loans, unsecured debts etc. Whereas the interest rate sensitivity is concerned, most of these studies find interest rate sensitivity of borrowing behaviour. The main disadvantage of those studies is the focus of certain product group or very limited scope of borrowing behaviour. Very few studies have focused on the whole range of borrowing behaviour, on the motives of private persons and their rationality on financial behaviour. The current study focuses to the borrowing behaviour of private persons through the questionnaire approach, but different to the other similar studies the focus is more on interest rate issues. Interest rate influence has not been analysed in the current study only on making borrowing decisions or evaluating indebtedness, but also on their influence to the overall financial behaviour of private persons (rationality of private persons' financial behaviour). The wider analysis approach would better help to understand interest rate influence to the intertemporal behaviour of private persons.

The current study has been organised as follows. In literature review a quick review of different models of borrowing behaviour has been presented. The main focus is on studies including interest rate influence on the borrowing behaviour. The basic approach of traditional borrowing behaviour model is presented as well as models where interest rate does not appear as important as on classical models. Recent studies of credit behaviour analysis are questioning the classical approach of money market models and the importance of interest rate as the main variable of credit models.

In the research section, the survey of 324 persons is introduced. First, the study focuses on the issues of indebtedness of private persons (private persons in Estonia have one of highest credit burden in CEEC). According to classical financial behaviour models, the borrowing activity of private persons should be influenced by the interest rates. Therefore, the indebtedness analysis coveres the analysis of the interest rate influence to the indebtedness of private persons. There are also introduced several other characteristics which have the influence to the private persons' borrowing behaviour and their indebtedness.

Second part of empirical findings is focusing to the borrowing decision making process and how the interest rate influences the borrowing decision process. Determinants of the borrowing decision, including the interest rate, are analysed. Taking into consideration that the survey was carried through at the end of 2008, the questions covered also subjects as what could encourage further borrowing activity of respondents (at the second half of 2008 the economic growth slowed down and last quarter was already a decline in Estonian economy accompanied with rather high interest rates and slowly

growing unemployment). Also the purpose of borrowing activity of private persons is analysed.

Third part of findings focuses on wider analysis of financial behaviour of respondents, including their consuming habits, overall financial behaviour, attitudes in money matters etc. Those aspects were analysed through the cases of financial situations where respondents were asked to describe their behaviour on these situations. The results were analysed within Likert-type 5-level scale. Findings are presented and discussed more in detail on the third part of the study.

The last part of findings is focusing to the risk-group analysis. Within the study the unique approach to the risk-group definition has been used which utilise the interest sensitivity of respondents. Comparing the differences of interest sensitive respondents with total sample of respondents several overall general characteristics as age, sex, occupation, nationality etc are analysed. Important behavioural characteristics and issues related with attitudes to the money matters are also analysed to discover significant differences between the groups of interest sensitive persons compared with the total sample group.

2.1.2. Literature review

The literature review of borrowing behaviour models of private persons is divided into two groups: classical models, where interest rates are considered as important determinants of credit behaviour, and models of financial mismanagement (models where interest rates have much lower importance or even has been excluded from models at all).

Part A: Classical model / descriptive models

Most quoted models of borrowing behaviour base on the classic approach of third-degree price discrimination where the loan price determines the borrowers' demand for a loan along with income and other personal characteristics (Cavaluzzo, 1998; Gary-Bobo, Larribeau, 2003; Brueckner, 2000). The model can be expressed as follows:

$$L = L\underset{-}{(}i, \underset{+}{w}, \underset{+}{A}, \underset{+}{T}, \Phi)$$

where L denotes the loan amount, A denotes accumulated savings (which could be used as a down payment for the loan), w denotes the wage, Φ stands for other observable borrower's characteristics, i denotes the interest rate and T maturity time for the loan. The obvious conclusion is that the demand for loans is negatively determined by the interest rate, where higher interest rates would reduce the amount of loans. For empirical testing several studies have added to tested variables, also variables related with the supply side of the money market (Ehrmann et al, 2003). There could be used very different approaches to proxy

proper supply side variables and the final composition of empirically testable variables. The focus of the current study is the borrower's behaviour and therefore the supply side of borrowing is not further discussed.

Another approach to determine the loan inherits form the permanent income model first described by the F.Modigliani in 1958. The intuition behind the model is that consumers are forward looking individuals who calculate rationally their future consumption and then attempt to optimise consumption as much as possible. The change in consumption from time t-1 to time t depends primarily on changes in expectations about future income (sometimes $(E_t - E_{t-1})Y_{t+k}$ is referred to as "news" about future income) but also a discount rate r of intertemporal choices as described in the following formula

$$\Delta C_t = C_t - C_{t-1} = \frac{r}{1+r}\sum_{k=0}^{\infty}(1+r)^{-k}(E_t - E_{t-1})Y_{t+k}$$

where E_i denotes the expectation function, C_i stands for consumption and Y_i for income.

To discuss the formula in more general way considering the life-cycle of private person, the standard upward sloping path for labour income over the working life of private persons could be assumed. Persons dis-save in the early part of their working life, and their consumption is financed by borrowing. As persons ages and labour income grows, indebtedness decreases and once the debt will be repaid, assets will be accumulated. Later in life, when the persons are no longer working, they dis-save again by consuming the earnings on their accumulated assets and gradually running down their stock of wealth. The debt position of an individual person can therefore be determined by the path of future income and the interest rate (relative to the discount rate).

The formula has been widely used in several studies using to model private persons' borrowing in different countries (Blundell-Wignall, Gizycki, 1992; Jeanfils, 2000; Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006). These studies show that the development of private sector loans can be reasonably explained by aggregated macroeconomic variables and find evidences for a stable long-run relationship between real loans, GDP and real interest variables. The wide usage of aggregated data in sophisticated econometric models requires a careful selection and analysis of proxy variables in the testing model. Despite the rather intensive use of permanent income hypothesis in empirical studies to find explanatory variables for the credit growth, there are several implications which should be carefully considered using empirical tests and later interpretation of those findings. Explanatory variables included into the model could have instead of expected direct influence to the credit growth a indirect influence (Fritzer, Reiss, 2007; Mishkin, 2007; Catte et al, 2004) or the proxy variables could have different usage in empirical tests (Tsatsarronis et al, 2004). There could be also a phenomena of reverse-type of life-cycle consumption model (Debelle, 2004) where in some developing countries in low

endownement of initial wealth and quick liberalisation of liquidity constraints for households would induce a strong dissaving activity of middle-age people and have rather low activity in younger and elderly side of age groups. Those implications would require further development of testing models or could be solved with usage of several simultaneous studies using different methodology

These descriptive classical models have been applied not only in overall debt market or mortgage loans' market but also in studies of consumer credits and credit cards. Studies of consumer credits and credit cards are focusing mainly to analyse the pool of data to discover interest rate elasticity, elasticity of substitution between different cards or implications of liquidity constraints. There have been found small effects of interest rates on consumption and savings (Hall, 1988), however these findings have been questioned by methodological complications (Gross, 2005). There has been discovered the implication of interest rate elasticity to monetary policy (Gross, 2005), business cycles as well as tax incentives for saving (King, 1988).

Part B. Models of financial mismanagement

The essential characteristic of models of financial mismanagement is the absence of the influence of interest rate to the loan decision or amount borrowed. Even though direct questionnaires and other methods could not be ultimately linked to mismanagement behaviour of private persons, the empirical results of direct methods mostly report absent interest rate influence to financial behaviour of private persons (Livingstone, Lunt, 1992; Stone, Maury, 2006; Kalafatelis et al, 2005). In the following part these two different approaches to the borrower's financial behaviour are discussed: direct approach or questionnaires and indirect approach through the different studies of consumer credit instruments.

There are some studies which analyze borrowers' behaviour directly through the questioning of (potential) borrowers. The aim of these types of studies is to find out possible behavioural characteristics of borrowers and to group these characteristics based on different criteria (s.c. risk group identification) (Kempson et al, 1994; Kalafatelis et al, 2005). The ultimate advantage of the direct study of private persons' behaviour is the possibility to analyse borrowing behaviour without any assumption of determinants of borrowing behaviour.

One of the early direct studies of the borrowing behaviour of private persons has been carried through by Livingstone and Lunt in order to collect and to analyse wide range of different data that possess sufficient demographic, economic, psychological and situational factors to fully specify an explanatory model of borrowing decision (Livingstone, Lunt, 1992). The main limitation of these type of studies is to have enough representativeness for drawing conclusions to whole population. On the other hand, it should be mentioned that too narrow focus of the empirical research (the study of certain group of individuals) would significantly decrease the efficiency of the direct study method which limits the wider usage of findings of these empirical studies. There are very few direct studies which are targeted to financial behaviour of whole population, to specify

and analyze the "risk groups" and specify the pattern of their financial behaviour (Kalafatelis et al, 2005; Stone, Maury, 2006).

One of these direct studies, which also have influenced the current study of borrowing behaviour of private persons in Estonia, is targeted to analyse Australians' financial behaviour to design tools for financial protection of risk groups (Kalafatelis et al, 2005). The sample group of this study covered the wide spectrum of the population, which makes findings useful to draw conclusions to whole population. According to the several risk-group studies there are approximately 10...30% of population, who could be considered as a risk group people based on their financial behaviour (Kalafatelis et al, 2005; Collard, Kempson, 2005). According to those studies, persons belonging to the risk group are usually younger people under age of 40, belonging to national minorities and living in households with children.

Besides the questionnaire approach, there are also other approaches such as models of financial mismanagement. Most popular research topic of modelling financial mismanagement has been the stickiness of the credit card interest rates (Calem, 1995; Sulaiti, 2006). Credit cards play an important role in consumer finance where about 20 percent of private persons' consumption in US is being purchased using credit cards (Chimerine, 1997). Moreover, most of credit cards represent also the leading source of unsecured credit.

For credit card users, annual interest rates are charged for the usage of the credit would be irrelevant if the balances are actually repaid every month. However, at time of making a decision, whether to use a credit card or not, the decision is based by a customer's belief to repay, not to the actual repayment. *Ceteris paribus*, the higher degree of unrealistic optimism – the stronger belief to pay off open balances at the end of each month – would cause the less sensitivity to the credit card interest rate.

The credit card market has been analysed by different authors. The rigidity of the credit card interest rates is the outcome of the "irrational behaviour" of customers, who do not intend to borrow on their credit card accounts, but find themselves doing so anyway (Ausubel, 1991). Those customers with unrealistic optimism of their future ability to pay off open balances would attend less attention to the credit card interest rate relatively to more realistic customers and stronger preferences to credit card fees than more realistic customers (Yang, 2006). Also customers with unrealistic optimism tend to be less willing to search for credit cards that offer better features than are those customers with a more realistic view to their future borrowing (Calem, 1995). Credit card usage by consumers is changing radically the landscape of consumer behaviour motivating them to buy more often and promoting impulse buying (Sulaiti, 2006).

There are several studies which focus instead of the overall economic matters more to the behaviour and protection of risk group people. Several studies point out wide difference between behaviour of different groups of people (Ausubel, 1991; Gross, 2001; Stone, Maury, 2006; Brown 2005). These differences could be rather significant to design future studies of macro-level

data where the average behaviour could be rather misleading to describe the borrowing behaviour of private persons.

2.1.3. Data description

The survey of Estonian households' financial behaviour was designed to examine in detail the patterns of financial behaviour, motives of these different people and the interest influence to their financial behaviour. The idea of the study was instead of focusing to the certain credit product group or to specific group of people to analyse the wide group of private persons, their attitudes, their financial behaviour and determinants they consider important in borrowing decision process. The analysis of the wide group of people would allow to draw conclusions to the borrowing behaviour of whole society instead of analysing the features of the certain credit product or certain group of people (for example, the people with the credit). Therefore, it was important to get a good coverage of different age groups, different geographic coverage, different work experiences, different financial obligations, and different nationalities of Estonians. The survey is based on structured questions conducted in form of interviews in different places of Estonia between September and November 2008. Questionnaire was composed only in Estonian language and when necessary it was translated by interviewing persons to respondents.

Table 2.1.1. General description of respondents

Data of sample group	Data about Estonia (th of inhabitants)			
Total number of respondents/ total number of inhabitants:	324	100%	1 340	100%
Male	170	52%	617	46%
Female	154	48%	723	54%
Estonians	227	70%	921	69%
Non – Estonians	97	30%	419	31%
Residents of capital Tallinn	75	23%	399	30%
Residents from outside of Tallinn	248	77%	942	70%
Employees	214	66%	606	58%*
Students	14	4%	109	10%*
Retired	24	7%	229	22%*
Unemployed	19	6%	38	4%*
Self-employed	53	16%	51	6%*

* The structure of labour status has been calculated based on population aged between 15–74 (in 2008 in Estonia counted 1 042 800 people on these ages)
Source: Statistikaamet,

Important characteristic on permanent income hypothesis is the age structure. Therefore the questionnaire consisted of the respondents' age which was later

used as a study variable. Division of age group is as follows: 27 people at the age of 0 ... 24 years; 202 persons at the age of 25...44 years; 75 persons at the age of 45 ... 64 years and 20 persons more than 65 years old.

The questionnaire included five parts. First part covered general descriptive information about respondents. Second part included questions where respondents gave information about their indebtedness and evaluated their indebtedness. Third part of questionnaire described respondents' motives to decide to borrow or not to borrow. Fourth part of questionnaire was designed to evaluate respondents' credit behaviour by using Likert-type 5-level scale for 8 questions. Fifth part consists 18 wider type of economical behaviour dilemmas which respondent evaluated by using Likert-type 5-level scale.

The survey itself included more behavioural situations as well as specific information about the respondents – family status, number of children etc. In the current paper the main focus is the interest rate influence on the behaviour of respondents, therefore some of those questions and parameters are not used in further analysis.

2.1.4. Discussion of results

The research results reflect three issues of interest rate influence on the private persons. Part A covers general description of financial indebtedness of private persons in Estonia as the size of the loan, primary source of borrowing, the evaluation of indebtedness etc. Special focus is on evaluation of interest rate as determinant of financial indebtedness. Part B covers decision-making procedure of borrowing and the influence of interest rate to that process. Part C covers other topics of financial behaviour of private persons and interest rate influence on that. Part D focuses on behaviour of interest sensitive respondents comparing it with characteristics of total sample.

Part A: Financial indebtedness and interest rate

The borrowing activity of sample group shows that only 86 out of 324 answered positively to the questions that they have mortgage loans (28.4%) while 183 respondents out of 324 answered positively that they have some financial obligations (56.8%). 162 respondents answered positively for having any type of credit card (50.0% of respondents). Short overview of main characteristics of borrowers is presented in the Table 2.

Table 2.1.2. Percentage of respondent groups who have any type of financial obligations

General characteristics of respondents	Total number	Financially obliged	%
Total respondents	324	183	56.8%
Male	170	103	60.6%
Female	154	80	51.9%
Estonians	227	120	52.9%
Non-Estonians	97	63	64.9%
Residents of capital Tallinn	75	50	66.7%
Residents from outside of Tallinn	248	132	53.2%
Employees	214	129	60.3%
Students	14	2	14.3%
Retired	24	5	20.8%
Unemployed	19	8	42.1%
Self-employed	53	39	73.6%
Have children or other dependent persons	176	124	70.5%

The size of credit what respondents have taken is presented in the following table. As it shows most of the loans are relatively small – 77% of respondents with financial obligation stated their loans up to 500 000 eek (32 000 eur). Here should be mentioned once more that presented figures are based on the evaluation of respondents and are not studied through the financial statements of respondents.

Table 2.1.3. The size of credit taken

Size of the credit	Number of respondents	% of respondents
Less than 100 000.– eek (6400 eur)	79	43%
Between 100 000 (6400 eur) and 500 000 (32000 eur)	61	34%
Between 500 000 (32000 eur) and 1 mil (64 000 eur)	13	7%
Between 1 mil (64 000 eur) and 3 mil (200 000 eur)	20	11%
More than 3 mil (200 000 eur)	9	5%

Despite the huge number of different possible sources of the credits as catalogue credits, leasings, different types of consumer credits (credits which are tailored to purchase items), we asked respondents to specify their primary source of borrowing using three type of multiple options – banks; friends and relatives; other institutions. According to this analysis most of the respondents (176 respondents out of 320; 55.0%) consider the primary source for credit banks. Therefore, most of the population consider themselves to have an easy access to the mainstream financial institutions. Relative high proportion of the

respondents noted the primary source of the credit as friends and relatives (133 respondents out of 320; 41.6%). According to the previous studies, where the access to the mainstream financial institutions has used as a proxy to the risk-group belonging (Kempson, Whiley, 1999), the results of the current study should be interpreted differently. The borrowing of the friend and relatives could mean a short time borrowing; also it could indicate traditions in borrowing behaviour where small credits are rather taken within the small group of closest friends and relatives. 11 respondents out of 320 (3.4%) quoted other institutions as their primary source of borrowing.

Next, we asked respondents to evaluate themselves their credit burden. Whereas the optimal credit burdening of a single private persons is very dependent on several characteristics which are observable only to a person itself (Cavaluzzo, 1998; Gary-Bobo, Larribeau, 2003; Brueckner, 2000), the only reasonable option to measure optimal credit burdening is through respondents' evaluation. First, it was asked to estimate the burden through the four possible multiple options: easy, normal or heavy burden and difficult to define. Later we also asked respondents to describe their evaluation criteria for the credit burden giving multiple options as monthly credit repayment, interest rate or interest payment, proportion of credit repayment to income and maturity of loan to specify their evaluation criterias. Results are presented as follows. As it can be seen, more than half of respondents find their credit burden normal (56.2% of respondents). It should be mentioned that the survey took place at Oct–Nov 2008 when the employment ratio was rather high and expectations for economic decrease was quite moderate.

Table 2.1.4. Credit burden evaluation

Credit burden evaluation	Number of respondents	% of respondents
Easy	41	24.3%
Normal	95	56.2%
Heavy	33	19.5%

Our special interest was to analyze respondents' attitude and their consideration process of evaluating their financial burdening and how important is the influence of interest rate within these evaluation parameters. It should be mentioned that those parameters are not universal even in the Estonian case; they could be used to describe and quantify the behaviour of persons only in the specific moment of time. It is quite obvious that in more prosperous times those evaluation parameters could be different what they are in economic recession periods where people would evaluate their credit burden and indebtedness rather differently.

Table 2.1.5. The evaluation parameters through which private persons evaluate their financial indebtedness (persons who have taken the credit)

Evaluation parameters of indebtedness	Number of respondents	% of respondents
Percentage of income (salary) for serving debt	67	37.0%
Maturity of loan	16	8.8%
Interest rate	5	2.8%
The size of monthly payment	85	47.0%
Other parameter	8	4.4%

According to the results presented in the table 5, interest rates as decisive parameter for credit burden evaluation has directly rather insignificant role. Surprisingly, the most often used approach to evaluate indebtedness and credit burden is the monthly payment in absolute terms. Even though the monthly payment could also be linked to the interest payments, the high usage of monthly payment for the evaluation of the indebtedness refer to the very different decision making procedure on borrowing decisions then classical financial behaviour models would describe. Instead of comparing the intertemporal consumption preferences weighted by the premium for savings, consumers consider on borrowing the certain amount of money what could be used for credit repayment (47 % of respondents) or a certain proportion of income what could be used for serving credits (37 % of respondents). The interest rate as the endogenous variable for financial behaviour has a rather little role for specifying respondents' behaviour, where only 2.8% of respondents noted it as an important parameter for evaluating their financial indebtedness.

Part B Decision of borrowing and interest rate influence

In the second part of the current empirical study the special focus is on the borrowing decision. In this subsection we analyze the decision making process of those 56.8% of respondents, who have stated that they have financial obligations as well as those respondents who might consider borrowing in short time in the future. What are those determinants based on what respondents considered or will consider their borrowing? How important is the level of interest rate when the borrowing decision is made? The results of the analysis are presented in the following table.

Table 2.1.6. Determinants of borrowing decisions (within persons with credits)

Determinants of borrowing decision	Number of respondents	% of total sample group
Favourable price level	20	11.6%
Urgent need for goods/services	90	52.0%
Increase of income/salary	22	12.7%
Favourable economic climate	11	6.4%
Favourable interest rates	10	5.8%
Advertising	5	2.9%
Other	15	8.7%

As it shows in the table 6, the most important motive for borrowing is the need for goods or services – 52.0% of respondents have quoted it as a main motive. Favourable interest rates are considered only by 5.8% of respondents as the main determinant of the borrowing decision. By assuming decreasing but still positive marginal utility of consumption and the classical descriptive models of borrowing, the constant need for consumption should be balanced by the external parameters and premium for delayed consumption or by the interest rate. The strong domination of urgent need for consumption between the determinants of borrowing decisions could be explained by the lack of the goods in developing society (Debelle et al, 2004) or by the domination of consumption motive in the borrowing. Unfortunately, there is no good methodology to test explicitly the consumption-oriented borrowing behaviour of respondents. Still the strong domination of consumption motive combined with strong positive expectations could be considered most influential determinants of borrowing decisions of private persons.

It should be stressed that most of respondents do not plan to borrow in the near future any money – that applies to 78.6% of respondents. Therefore, it would be rather interesting to follow the motives what should change in the current situation to encourage respondents to consider further borrowing. Results are presented in the table 7, which includes answers of all respondents (with and without the current credits).

Table 2.1.7. Changes what would encourage further borrowing activity

Parameters to encourage further borrowing	Number of respondents	% of respondents
Favourable price level	15	4.7%
Urgent need for goods/services	107	33.9%
Increase of income/salary	97	30.7%
Favourable economic climate	51	16.1%
Favourable interest rates	29	9.2%
Other	17	5.4%

Still, the considerable number of people considers the borrowing based on their consumption needs where urgent need for goods/services indicates directly to consumption motive and increase of income/salary indirectly for consuming motive on borrowing. It should be mentioned, that the consumption motive for further borrowing is much more balanced with outside determinants then the consumption motive of previous borrowing (see the table 6). Also the influence of the interest rate is much higher then in previous borrowing. Following table presents the purpose of future borrowing.

Table 2.1.8. The purpose of further borrowing

Residential spending	71	22.8%
Car	25	8.0%
Travelling	12	3.9%
Studying	14	4.5%
Consumer items	43	13.8%
Spending for children	42	13.5%
Other	104	33.4%

According to previous analysis could be concluded, that the primary source of the indebtedness of respondents is consumption, which is encouraged by the increase of the income and the salary. The table 8 presents the possible structure of the future borrowing which includes mainly borrowings for durable goods. Despite the high real estate prices significant amount of respondents consider still to borrow to improve their living conditions (22.8% of respondents).

Part C Financial behaviour and interest rate influence

The third part of the empirical study is focused on the interest rate influence to the (financial) behaviour of private person (mainly persons, who have taken the credit). Results presented below are based on the Likert-type 5-level scale approach, which has been used to evaluate respondents' opinion on to presented situations. The scale has been built up from 1 to 5, where 1 means strongly agreed and 5 means strongly disagreed. In the following table some of these behaviour cases are presented together with some descriptive statistics.

Table 2.1.9. Some cases of financial behaviour of respondents

Selection of financial cases	Mean	Standard deviation	Z test*
Few hundred kroons additional loan payment is not a problem for me	2.44	1.41	1
I know exactly my loan interest rates	2.83	1.45	0,98
I have recently changed my consuming habits due to higher interest rate	3.88	1.27	0
When the interest rate will increase by 1% I shall change my consuming habits	3.90	1.22	0
Interest have increased significantly within last two years	2.27	1.03	1
I know what EURIBOR means	2.92	1.53	0,81
I have recently changed my consuming habits	2.96	1.37	0,72

* Z-test have been performed against the neutral answer (by Likert-type 5-level scale the μ_0 is 3.00)

According to the results presented in the table 9, the respondents are well aware of the money market developments and their interest rates (with 0.01 and 0.05 level of significance respectively). Even though the interest rate is well known for respondents, EURIBOR as the basic financial term in credit contracts is not well known. That can be explained by the relatively small size of the total debt outstanding – 76.9% of respondents have reported their financial obligations to be less than 500 000 eek (32 000 eur). Usually consumer credits, credits from relatives, leasings, catalogue credits etc have fixed interest rate and therefore not directly related with interbank quotations as EURIBOR. It is also important to notice, that respondents have not changed their consuming habits due to higher interest rate nor on situation, where interests would increase 1% (on the level of 0.01 significance). The same behaviour situation presented also indirectly – whether an additional loan payment in the amount of a few hundreds of kroons per month would be a problem for respondents – shows that interest rate increase would not change the behaviour of respondents (on the level of 0.01 significance).

These financial behaviour characteristics are rather descriptive for the total sample group of respondents. As one can see, respondents are rather inflexible to change their consuming habits. Also they are not very willing to change consuming habits due to the change in interest rates. As the results in the table 9 shows, the interest rates do not play an important role in the financial behaviour of respondents nor influence their consumption habits. This finding is in line with a findings from the previous subsection of the current study where the influence of the interest rate to the borrowing behaviour of respondents was rather insignificant (5.8 % or 9.2 % of respondents who have taken the credit or who consider to take credit consider respectively interest rates as an important determinant). It should be mentioned also, that the mean indebtedness is rather

low (76.2% of respondents have borrowed less than 32 000 eur or 500 000 eek) and therefore the influence of interest to monthly lump payment is rather low too.

Part D Financial behaviour of interest sensitive respondents

In the final part of the empirical analysis, possible determinants of risk groups were analyzed. Within the study we have chosen interest rate sensitivity as the selection criterion for the risk group behaviour. As in previous chapter, we concluded one option to describe the rational behaviour in the money and credit market is the influence of interest rates to the financial behaviour. The interest rate has also been considered throughout all the current study as one of the important external parameter influencing the borrowing and financial behaviour of private persons. Based on this approach, the interest rate influence to financial behaviour could be considered as the ability of private persons to correct their consumption and borrowing behaviour based on the external influences.

Within the current part we have grouped the interest sensitive respondents and compared their characteristics with the characteristics of the total sample group. Selection of interest rate sensitive respondents has been made based on the question – have you recently changed your consuming habits due to the higher interest rates. Selection criterions were "strongly agree" and "agree" choices – number of those respondents where 48 (14.7 % of the total sample group). General description of interest sensitive group is presented in the following table.

Table 2.1.10. General description of interest sensitive respondents

Total number of respondents:	48
Male	22
Female	26
Estonians	28
Non – Estonians	20
Residents of capital Tallinn	9
Residents from outside of Tallinn	39
Employees	29
Students	5
Retired	0
Unemployed	4
Self-employed	10
Have children or other dependent persons	31

When comparing these general descriptions with general descriptions of the total sample group, it becomes obvious, that generally characteristics of those samples are rather identical. Main differences come from male respondents

(45.8 % in interest sensitive group compared with 52.1 % in total sample) and self-employed persons (20.8 % in interest sensitive group compared with 16.3 % in total sample).

Even though interest sensitive persons had similar amount of debt as the main sample group they still considered their financial burden more heavy (27.3 % in interest sensitive group compared with 13.7 % in total sample group). Taking into consideration the average size of the loan (67.6 % of respondents in interest sensitive group had taken loans up to 500 000 eek compared with 76.9 % of respondents in total sample group) and the proportion of wages and income used for servicing the credit (18.8 % of respondents in interest sensitive group compared with 15.3 % of respondents in total sample group) we could state, that interest sensitive persons are more precautious then the general sample group.

Analysing the borrowing decision making procedures of different respondent groups, the main difference between these two groups comes in delaying borrowing decision. When 26.8 % of the total sample group respondents answered to the main reason of the borrowing "urgent need for goods/services" and 22.5 % answered "favourable economic climate" then in the group of interest sensitive respondents these reasons had respondency rates 14.6 % and 31.0 % respectively.

The best criterion to differentiate interest sensitive persons from the total sample group of respondents could be behavioural characteristics and attitudes to the money matters. In the current study the comparision of some overall behaviour characteristics of interest sensitive persons have been compared with characteristics of the total sample group. In following table has been presented results of this analysis. The Z-test has been performed against the mean of behavioural cases of the total sample group noted as the μ_0 in the following table.

Table 2.1.11. Some cases of financial behaviour of interest sensitive respondents

	Mean	μ_0	Z test
I consider myself frugal	2,100	2,446	0,996
In money matters I feel myself confident	3,563	3,026	0,007
Often I have spent my money before I receive the salary	3,484	2,666	0,000
Few hundred kroons additional loan payment is not a problem for me	2,813	2,442	0,047
I know exactly my loan interest rates	2,191	2,827	0,999
When the interest rate will increase by 1% I shall change my consuming habits	2,938	3,897	0,999
I have recently changed my consumption habits	2,521	2,956	0,985

Behaviour analysis shows that interest rate sensitive respondents have more responsible consuming habits – they have, in average, corrected more often their consuming habits compared with the total sample group as well as corrected their consuming habits due to the changes of the external economic environment. On the other hand, interest sensitive respondents are more frugal and value even small amount of money. Focusing more in the money matters makes them better planner in money matters. Contradictory, the lower confidence in money matters within the interest sensitive respondents (higher amount of interest sensitive respondents feel more unconfident then total sample group) can be explained by overall confidence and is not related with the real competence of respondents (Kalafatelis, 2005).

2.1.5. Conclusions

The aim of the current study was to evaluate interest rate influence on the borrowing behaviour and overall financial behaviour of private persons. To cover the full scope of the private persons' financial behaviour, the study was divided into four parts. First part deals with the influence of the interest rate to the indebtedness of the private persons; does a private person, evaluating indebtedness, considering somehow also interest rates. Second part studies in detail borrowing decision-making process and evaluates determinants of this process. Third part deals with everyday financial behaviour issues and analysis the interest rate influence on this behaviour. The final part deals with the risk-group issues in the credit market where the risk group behaviour is modelled through the interest rate sensitivity to the overall financial behaviour.

According to the classical descriptive models of credit markets, the financial indebtedness should be influenced by the interest rates. Our study shows that respondents do not evaluate indebtedness through the interest rate as well as the interest rate does not have considerable effect to the indebtedness. Only 2.8 % of respondents who have taken the credit (and 4.0 % of respondents who have not taken credit) consider interest rate as an important determinant of their indebtedness. According to our study 47 % of people with credits evaluate their financial indebtedness (or financial burden) by monthly loan repayment and 37 % by relative loan payment (as percentage from income). The findings are in line with other empirical studies were the savings has been found strongly related with the (expected) growth of income and possession with durable goods (Foley, Pyle, 2005; Kulikov et al, 2007). Most of the respondents consider their financial indebtedness normal even though they do not consider borrowing more in nearby future. Normal financial burden would be around 17% of the monthly income.

Also, when the borrowing decision making is considered, the respondents with credits consider mostly the urgent need for goods or services – 52 % of respondents. Favourable interest rate was considered as the main determinant only by 5.8 % of respondents. The interest rate was also not considered

important in borrowing decision making process in the future – 33.9 % considered need for goods/services the most important determinant for the future borrowing, 30.7 % of respondents consider the increase in income and only 9.2 % consider favourable interest rates. Therefore, the interest rate as the external determinant of the borrowing decision is relatively weak and is outperformed by other external macro determinants (expected increase of income, price level and favourable economic climate).

In our study we showed that respondents have rather good knowledge about the interest rate matters – they know interest rates they pay, they follow trends in the money market as well as they are aware of the main terminology in this field. Therefore, we cannot account peculiarities of financial behaviour of private persons to incomplete financial knowledge (Campbell, 2006; Weinberg, 2005). But still, the interest rate development does not change private persons' overall financial behaviour. Higher interest rates do not stimulate to change their consuming habits or save more for future. Here should be stressed, that those empirical results are valid for the total sample group. Within this total sample group there are different subgroups which show somehow different financial behaviour.

In the final part of the study we analyse deeper one of the subgroups – interest sensitive respondents – and compare their behaviour with the total sample group. According to our analysis, the interest sensitive respondents do not differ from the total sample group by any general characteristics (age, sex, nationality, employment etc) or by lower amount of credits taken or by number of credit cards, for example. The main differences become notable on their different evaluation of indebtedness (interest sensitive respondents have lower level of s.c. normal financial burden) and their readiness to correct their consumption based on external factors (the main reason to delay borrowing decisions for interest sensitive persons is the unfavourable economic climate). Contradictory, they feel themselves more unconfident with money matters as the respondents of the total sample group. This effect would not indicate their poorer knowledge but much higher precautions. Even though the definition of risk group used in the current study is unique, the findings are in line with other similar studies (Kalafatelis et al, 2005), where the behaviour characteristics and attitudes are main determinant of the risk-group behaviour.

2.2. Investment management of Estonian companies

2.2.1. Introduction

What determines investment decisions of companies? Do macroeconomic factors and, specifically, interest rates influence investment decisions of companies? These questions have intrigued both academic and business people. The 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 and present the concept of cost-of capital to describe investment decisions of companies (Miller, Modigliani, 1958). Several later empirical studies in that field report different findings on the relationship between financial market characteristics and corporate investment decisions, showing a large variation on their magnitude and direction of correlation. Even though the assumptions of the Miller and Modigliani model nowadays have been questioned, still, many studies would lean to a strong influence of interest rates on investment decisions.

The purpose of this study is to analyze the determinants of investment decisions of companies using the data of Estonian companies. Several empirical studies find the influence of cost of capital on investment decisions (Cummins et al, 1994; Tevlin, Whealan, 2003; House et al, 2006), whereas in other studies, rating determinants of investment decisions based on their influence on investment decisions find the direct interest rate influence rather unimportant (Bernake, Blinder, 1988; Oliner et al, 1995; Guiso et al, 2002; Gilshrist et al, 2008). Those more important determinants influencing investment decisions of companies may, in turn, be interest-sensitive and, therefore explain results of empirical findings of the interest rate influence on investment decisions. Recent empirical studies that distinguish direct interest rate influence on investment, and other indirect influences, have found a rather mild, or non-existence of direct interest rate influence on investment decisions. There are even a few studies that state the opposite correlation between the interest rate and investments.

The research method used in the current research gives the possibility to analyze not only the interest rate influence on investment decisions but, more specifically, the interest rate and other financial variables' influence through the framework of cost of capital. Therefore, our study does not argue as much over the interest rate influence on investment decisions but, differently from other studies, looks at the use of the cost of capital framework within the management of companies. Differently from most of the empirical studies in that field, where sophisticated econometric models are tested in the pool of aggregated data, we have analyzed decision-making motives through the direct responses from top managers of companies. The method used in the study gives opportunity to analyze investment decision motives of managers including their attitudes towards the cost of capital framework. Based on the questionnaire results we can distinguish the interest rate influence to investment decisions through the

framework of cost of capital from direct influence of interests to investments. Even though we have reached closer to the investment decision makers of companies, there remains the question of interpretation of results. Therefore, we used the literature review to work out questions and to explain our considerations.

Besides the cost of capital issues influencing investment decisions, there is analyzed the wider set of variables important for companies considering investments. There are an excessive number of empirical studies discussing the significance of certain variables on investment decisions, whereas in our study the ranking of important characteristics is presented. Due to the multiple-choice questionnaire, there is a closed set of possible answers. Still there could be that some important characteristics are not included into the questionnaire, even though we have used a large set of characteristics from other previous studies. For better interpretation and drawing conclusions, we later group these characteristics into several sub-groups and discuss the findings in line with other studies. Even though the methodology and questions for investment determinant ranking are not unique, the result of the ranking is rather unique and could be used in further academic discussions as well as for practical purposes.

Within the analysis of determinants, we also focus more deeply on financial constraints of companies. Based on the financing preferences of the investments discussed in the literature review, we analyze the existence of liquidity constraints of companies and their influence to investment activity. According to several studies of monetary transmission mechanisms, the financial constraints could be also another important framework explaining the interest rate influence on investment activities. Therefore, the simultaneous study of several decision-making frameworks that are influenced by the interest rates gives the unique opportunity to compare their significance and rank their influence on the management of companies.

The rest of the paper is organized as follows. The literature review contains an overview of classical investment theories where several cost of capital variables used in other studies are discussed. There has also given a brief review of the discussion of other important variables of investment activity, such as liquidity constraints and the uncertainty influence on investments. Finally, some other aspects of investment management, such as industry influence, ownership structure and the size of a company are introduced. The methodology and data section explains the composition of the questionnaire and gives a short overview of responding companies, as well as the questioning procedure. As the sample of companies consisted of only 44 of the 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 the findings. There is a section for the ranking of several factors influencing investment decisions of companies as well as separate sections where the interest rate influence on investment decisions is discussed. Within the study, the cost of capital framework is discussed and the role of the framework on management of Estonian companies is analyzed. Finally, some conclusions are drawn about the investment management in Estonian companies.

2.2.2. Literature review

The neoclassical interest-profit theory of investments says that investment depends on the interest rate, given a demand curve for investment that 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 the expected rate of profit is higher than the rate of interest, whereas the expected rate of profit is determined along the marginal product curve. Therefore, the interest rate determines the amount of investments made by the company.

Further development of the 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 distinguishing between internal and external origin). This theory strongly influences modern mainstream economics at the micro level, as well as at the macro level.

The empirical studies tests the cost of capital influence on investment decisions using a 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. It has been pointed out the interest rate influence on investments through the overall demand in economy, and possible influence on investment decisions through the expected revenue of the company (House et al, 2007; Gilchrist, Zakrajsek, 2007). In addition, the direct questionnaire methodology includes the risk of biased answers from respondents, where answers could describe convenient answers and not the real motivation of managers, and, therefore the cost of capital influence has been 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 besides the interest rate. Inflation and inflation uncertainty have 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 of the cost of capital. There are empirical studies investigating the inflation uncertainty influence on investment decisions of companies, which find a 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[16].

The influence of corporate income tax 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 corporate income tax rate would not change the ranking of investment projects' expected profitability. Thus, corporate income tax rates would not influence investment choices directly within a country. Personal income tax rates however would influence investment choices indirectly, because those tax rates would affect savings and, through this, the market-clearing real interest rate, reducing the propensity to save in society. These indirect phenomena would cause negative causality between income tax rates and investment activity. Empirical studies of taxation influence on investments cover a wider range of taxes, starting from property tax, social security taxes, etc., to income tax and other capital taxes. Generally, it could be stated that within the country the influence of taxes on the investment decision is rather mild, whereas the influence of taxes on foreign direct investment decisions might be significant (Dewald, 1998; Schanz, 2006; Tanzi, Howell, 2000; Canh et al, 2004). It has also been found that tax incentives play a higher role in developing countries than in developed countries (Tanzi, Howell, 2000; Canh et al, 2004), even though there is not a clear the reason for this. Still, tax incentives are not considered as the (most) important determinants of investments, therefore the high use of tax incentives to encourage investments would not, ultimately, indicate the high stimulation efficiency of investments. On other hand, the incentives to retain profits and encourage investments are important policies to support and encourage investments on small growing high tech companies (Heshmati, 2001). Therefore, the influence of taxes in monetary terms – the influence of the transmission mechanism through the cost of capital – might be relatively small whereas the influence of taxes in liquidity constrained companies – the monetary transmission mechanism influence through the availability of internal funds – might be significant.

In a world of perfect capital markets, the investment decision of a company would be independent from 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 (Fazzari et al, 1988; Hubbard et al, 1995; Bond et al, 1997; Kadapakkam et al, 1998; Gilchrist, Himmelberg, 1998; Love, 2001). 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 rate from companies on which they have less information. The risk premium in interest rates will be lower and depend on the net worth of a company, which can be seen as collateral for financing institutions. Due to the moral hazard effect, banks will raise premiums

[16] see for further discussion Wu (2006) and Bercenau (2006)

for external financing based on the relative indebtedness of a company. This is also the basic concept for the credit channel view of the monetary policy transmission mechanism, which depends on the idea that the investment decision of a company is dependent from financing decision.

As examples of credit rationing and the impact of financial constraints on investment decisions of companies, there are studies that empirically test the 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 on investments, companies prefer to use internal resources for investments, which would indicate the liquidity constraints of companies. However, there is considerable debate about the interpretation of these positive correlations. Besides 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 than 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 the 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. A similar explanation is for some other proxies for internal funds, such as the trade credits and overdrafts (Nielsen, 1999; Kohler et al, 2000; Valdemarra, Kaufmann, 2004; Riddiough, Wu, 2009), relations with banks (Elsas, Krahnen, 1998; Valdemarra, Kaufmann, 2004), invoice receivables and delayed payments (Cungu et al, 2008), etc.

Since late 1980s, several authors have stressed the impact of the 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 the resale price is substantially below the replacement costs. While the investment is irreversible, this introduces an option-value of postponed investments until a later time, when more information about relevant future events is available. If uncertainty is higher than the value of that investment, the 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 and investments are not in linear relations (Abel, Eberly, 1999; Wu, 2006; Cleary et al, 2007). There has been discovered the inverted U-curve – low levels of the uncertainty investment-uncertainty relation may show a positive correlation, whereas at high level of uncertainty this relationship starts to become negative – which may be explained by the so-called hangover effect of irreversible investment. It means that on the stage of low uncertainty, the higher uncertainty leads to higher cost of capital that would reduce incentives to invest. In higher level of uncertainty, the irreversibility of

previous investments would affect companies to invest more than their desired level of investment would be. Few empirical studies would support this theory (Ogawa, Suzuki, 2000; Bo, Zhang, 2003) reffering, that this negative uncertainty investment-uncertainty relation is related to the degree of irreversibility of investment. A wider empirical approach is to study the linear impact of investment and uncertainty (Abel, Eberly, 1999; Moretto, 2008).

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 the empirical part of the study, we shortly refer to two of those parameters: industry influence on the investment determinants and ownership structure on investment determinants. It has been found that industry affects the capital structure choices of companies (Chung, 1993), as well as the determinants within different industries might be different (Wilkes et al, 2002; Ogawa, Suzuki, 2000). In addition, the ownership structure has an impact on determinants of investments. Some studies (Goergen, Renneboog, 2001; Fathi, Gailly, 2007) find that concentration of ownership increases the sensitivity of investment as determined by free cash flow.

Finally, yet importantly, the influence of companies' size to investment determinants is briefly introduced. Several empirical studies show that larger companies are less constrained financially (Love, 2001; Fathi, Gailly, 2007), and the cost of capital consideration is higher in publicly traded large companies (Pinegar, Wilbricht, 1989; Kjellman, Hansen, 1995; Sander, 2003). This might be explained by higher information asymmetry in the case of small companies as well as the higher influence of agency costs per output of companies. Therefore, the results of the current study could be applied to all the Estonian companies even though the size of the average sample company is much higher than the size of an average Estonian company.

2.2.3. Data and methodology

The method of the current empirical study is the direct questionnaire, studying investment decision-making motives of Estonian companies and the importance of the cost of capital framework in investment decisions. There are a number of empirical studies using aggregated data to analyze motives and behavior of investment management, but having difficulties later on to interpret the results. The direct questionnaire avoids the problem of later interpretation, but obviously has problems of representativeness of the sample group. Still, there are several studies using the direct questionnaire method (Pinegar, Wilbricht, 1989; Kjelmann, Hansen, 1995; Wilkes et al, 1996).

Questionnaires accompanied with a letter explaining the aims of the research were sent to the CFOs of 200 of the biggest Estonian non-financial companies. The questionnaire itself contained a 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. The questionnaire was composed in the Estonian language. The study sample consisted of big companies where the knowledge and ability to follow and manage capital costs and financial indicators should be greater (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 study was carried out in 2001.

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 determinants plays an important role on the investment decision?"), or to rank in order of importance for their company. Some questions were behavioral situations with possible reactions (multiple choices) from which respondents could choose the most suitable reaction (for example "which of the following choices would better describe your financing decision in making a 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). The main modification considered the fact that most of the Estonian companies were not listed companies and, therefore, questions and terminology had to be rearranged. The current study differs also by the fact that study results are not anonymous. On the one hand this enables to mix data from different sources, but on the other hand may discourage respondents and reduce the response rate. Still, respondents were assured that the obtained information would be revealed to third parties only in aggregate form.

Respondent companies were quite different from the average Estonian company (Table 2.2.1). They were bigger in size and had lower financial leverage than the 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 than the average Estonian company. The financial capability, better knowledge, more human resources with higher specialization within the company should be considered when interpreting the results and drawing conclusions.

Table 2.2.1. The comparison of sample companies to the average Estonian company

The set of characteristics to compare average Estonian companies and sample companies	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 or have been the structure of companies from another study (Wilkes et al, 1996; Sangster, 1993). The structure is illustrated in Figure 2.2.1.

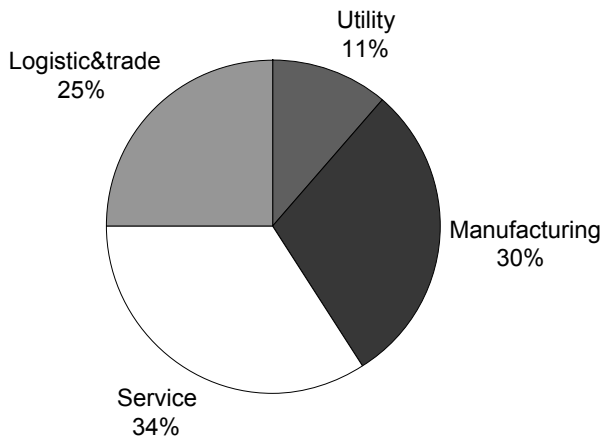


Figure 2.2.1. The structure of sample companies by field of activity

The ownership structure of the bigger non-financial companies is not matching a typical ownership structure of Estonian companies based on the study of Jones et al (Jones et al, 2003). In the study sample, state-owned companies and municipality-owned companies' together account for 32% of the total sample group (14 out of 44 respondents) whereas in other empirical studies they count it insignificant (Jones et al, 2003). Subsidiaries of foreign-owned or domestic-owned companies were 27% of the total sample group (12 out of 44 respondents) whereas in Jones et al study refer to 24%. Publicly traded companies were 11% of the total sample group (5 out of 44). Therefore, the sample would

not match the structure of Estonian companies, nor by the field of activity nor by the ownership structure.

Even though direct questions from managers of companies would help to overcome the problem of the later interpretation of data, there should still be carefully avoided misleading questions that could be interpreted in several ways. Similar studies conducted on investment management issues have found that interpretation of direct study questions can be confusing and easily misinterpreted. In the study of F.M. Wilkes et al (Wilkes et al, 1996), they found that high and rising interest rates would be seen from the managers' perspective as a negative determinant of investments due to the fact that high interest would reduce demand for goods and therefore, de-stimulate 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 this is something very different. Therefore, the results of the questionnaire should be carefully composed, avoiding as much as possible misleading questions.

The current study has deliberately avoided direct questions of the interest rate influence on the decisions of investments. Therefore, the questions of the interest rate influence have been replaced by other possible determinants of investment decisions, which could also reflect the efficiency of use of the cost of capital framework. The set of questions would give the context of the overall management and, through that, helps to better interpret the results. It has been deliberately avoided to link directly questions to any investment theory, which could later on limit the interpretation of the results. We are well aware that several of these multiple-choice questions could be considered interdependent but, whereas our study focus is on investment management framework issues, the ranking of variables could reflect the ranking of investment management concepts rather than ranking of independent investment variables. We are also fully aware of the possible distortion of answers due to the closed set of multiple options. Still we consider the influence of the closed set relatively small due to the high number of multiple choices, as well as the interpretation of results through the many questions. In addition, it should be stressed that the focus of the study is not to give a complete investment behavior model of companies, but to analyze certain aspects of the management behavior on investment decisions, such as use of the cost of capital framework in investment management.

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

are rather important variables in estimating the use of the cost of capital framework by the companies.

Several empirical studies have included corporate income tax to the set of testable variables of investment determinants (Cummins et al, 1994; House et al, 2006). In the current study taxation issues are also included in the set of multiple options, as a determinant of investments. Based on the previous discussion the corporate income tax could be considered as a determinant of the cost of capital and could affect investment similarly as the interest rates or inflation.

2.2.4. Results of the study

The results of the study have been organized through the three separate parts. First, respondents were asked to rank factors influencing investment decisions from the given set of determinants including factors related to the cost of capital framework of investment management. Findings of this analysis are discussed in the first subsection of the study results. The second subsection includes analysis of the interest rate influence on the investment management, where the importance of the cost of capital to managers' of companies is studied. The subsection consists of three different sets of questions related to the interest rate risks and interest rate management within the company. Based on these results, the framework of interest rate influence on investments is discussed. The third subsection analyzes the influence of the liquidity constraint through the financing preferences of investments.

Determinant of investment decisions

The set of multiple choices to analyze the determinants of investments were based on similar studies from other countries (Pinegar, Wilbricht, 1989; Kjellman, Hansen, 1995) as well as the consideration of the authors. Those determinants obviously included determinants of the cost of capital of companies. Results of the relative importance of the determinants affecting investment decisions are shown in Table 2.2.2.

As one can see, the set of important determinants is much wider than discussed previously in the literature review. By analyzing the relative importance of different factors it becomes obvious on the high importance of factors which could be related with investment projects, such as expected cash flow, risk and the size of investment. Other important factors could be related with the survivability and business confidence, such as financial flexibility, long-term survivability, financial independency and voting control of a company.

For a better interpretation of the results shown in Table 2.2.2, the investment factors could be grouped into following groups: factors related with the concept of the cost of capital (such as inflation expectations, taxation, maximizing share price, etc.), factors related with the concept of business confidence (expected cash-flow, survivability, financial independency, bankruptcy, etc.), factors related with the concept of uncertainty (risk of project) and factors related with

the concept of liquidity (size of the project, financial flexibility). The basis for division of investment factors is the internal behavior motives of companies, such as their vision or confidence to the future, their considerations through the cost of capital frameworks, their concerns of uncertainty and risks, or their financial ability constraints. Results are presented in Table 2.2.3, where the rank of these concepts has been calculated based on the average of these separate factors' importance presented in Table 2.2.2.

Table 2.2.2. Relative importance of factors and principles affecting investment decisions 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.

Table 2.2.3. Relative importance of group of factors determining investment decisions in Estonian companies

Groups of factors	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

It can be seen that the group of factors related with uncertainty and risks is the most important consideration in investment management, followed by factors related with liquidity determinants and business confidence determinants. Based on the multiple choices within the questionnaire, it becomes obvious that those risk and uncertainty issues are related with the investment project, rather than with the failure or bankruptcy risk of a company, or its overall business confidence. As the differences between those top ranks are relatively small, and the number of determinants in some group of factors is very low, then the ranking of groups could change, including adding more characteristics onto the list of multiple choices. It could therefore be stated that the investment management frameworks related with uncertainty, liquidity constraints and business confidence are important among Estonian companies. Despite the small sample group of companies the t-test was performed to test the significance of the cost of capital determinants. The testing hypothesis was that cost of capital determinants are less significant then other groups of determinants. The t-statistics were found by using the ranking figures of groups of factors brought in the Table 3 where the cost of capital determinants had $\mu = 3.087$ and $\sigma = 0.488$. All three tests were negative at the 0.1 significance level and therefore the test hypothesis should be rejected. On other hand, it should be noted that the tests' results are highly dependent on the size of the sample. Even though the test results were negative and the hypothesis should be rejected, the overall importance of other factor groups and the size of the sample group would allow stating the hypothesis of the relative low importance of cost of capital. The further analysis of cost of capital framework could therefore considered.

The relative low importance of the cost of capital would be in line with other empirical studies (Bopkin, Onumah, 2009; Wilkes et al, 1996). One explanation for the low importance of the cost of capital determinants could be the fact that the current sample consists of only 11% of publicly traded companies, and could therefore be biased towards the inefficient feedback of shareholder values. In addition, there are many companies owned by local municipalities or solely by other companies where managers would consider investment decisions rather differently than managers of independent companies (Hoshi et al, 1991; Goergen, Renneboog, 2001). Still, the low importance of the cost of capital framework is comparable with other empirical studies where the sample

consists only of publicly traded companies (Bernake, Blinder, 1988; Oliner et al, 1995; Love, 2001; Tevlin, Whealan, 2003; Schaller, 2006). Therefore, the reasons for why the costs of capital determinants have low importance need deeper analysis. The influence of the cost of capital, and behavior towards the interest rate risks within companies, are analyzed in the next subsection.

Another group of determinants, liquidity constraints, will also be analyzed more deeply in a further subsection. As presented in Table 2.2.2 and Table 2.2.3, the relative importance of liquidity constraints' framework is high on the management of investment decisions of companies. To give a better understanding of the importance of liquidity constraints in investment decisions for the whole sample group, the separate analysis of liquidity constraints' influence was presented in the questionnaire.

The surprisingly large importance within the investment management frameworks was in the framework related with the business confidence of managers. Factors influencing investment decisions, which are related with the business confidence, were cash-flow expectations from business projects, long-term survivability as well as financial independency of a company. All those factors reflect the aspects of attitudes toward the external economic environment and could be taken as proxies for the business confidence. Previous micro-level studies have not stressed the influence of business confidence on decisions of investment management (Wilkes et al, 1996). Still, several macro-level studies refer to the business confidence influence on investment decisions (Amato, Gerlach, 2001; Borio, Zhu, 2008). They state that companies treat the risk of projects as exogenous, and risk premiums also as exogenously given (or absent totally). Then the defaults, when they occur, will not change the behavior, but rather will change the attitude or confidence of companies. This would easily cause the over-exuberance or disappointment of companies that depend on the cycle of economy. Those procyclical business confidence stages would affect the investment behavior of companies. Therefore, it is also plausible to assume that the relative importance of business confidence determinants is cyclical and have strong time dependency.

As one can see, there are many factors that are ungrouped and cannot be related with any major investment management framework. Because the mean of those factors is rather low, their influence on investment decisions should be neutral. Therefore, determinants such as the behavior of competitors, or diluted shareholding, would have little impact on the investment management decisions of companies.

Cost of capital

As the analysis of investment frameworks showed, the cost of capital framework is not so popular among the biggest non-financial Estonian companies when the investment decisions are considered. Still, the question remains, namely, do interest rates have any direct influence on the investment decisions. In this subsection we analyze the importance of interest rates on investment decisions, not only based on the framework of the cost of capital, by using

several direct questions which were included in the questionnaire. Besides the direct questions of interest rate influence, which could on one hand be interpreted by respondents in several ways (House et al, 2007; Gilchrist, Zakrajsek, 2007), we approach the interest rate influence issue by analyzing the meaning of interest rate management on companies and, through this, the framework of interest rate influence on the investment decisions of companies.

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

The current questionnaire consisted of questions about the follow-up of interest rate exposure and expenditure as the main determinant of cost of capital of a company. Because most of the sample companies were not publicly traded and have loans from banks, we do not expect an active capital structure management, as could be in the case of publicly traded companies. Instead of this, the focus of the 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 would also explain the motives behind those decisions.

First, we were asking to specify how they would interpret possible interest rate risk for their company. 41 companies out of 44 considered interest risk as a possible interest cost influence on the profitability of the company. Only three companies considered interest rate risk as a determinant to the cost of capital, whereas only two of them were concerned with the possible influence on their share price. To estimate the result, the cumulative binomial distribution probability can be found. As the companies in the sample group are independent and their attitudes towards the interest rate risk could be considered binomial (the interest rate determines the profitability of their company or determines the cost of capital). Based on this construction we could test the hypothesis that cost of capital consideration is more important then the direct consideration of interest rate. The probability that three or less companies would not consider interest rate risks through the companies' profitability is 8.2E-8, which would clearly reject the hypothesis. This result would indicate that most Estonian companies would consider the interest rate as a determinant of profitability and the cash flow of the company rather than the determinant of cost-of-capital.

The second question was to specify the target of the interest rate management. 12 companies out of 44 (36% of the total sample group) answered this to be the direct interest costs, 6 companies out of 44 (18% of the total sample group) answered with the profit/profitability of the company and only one company mentioned the influence of interest rates on the company's investments. Fourteen companies out of 44 did not specify the target of interest

rate management. This result is in line with the first question, that companies are dealing with interest rates as a determinant of interest costs and, therefore, determines the profitability of company. Interest rates are not considered as a determinant of cost of capital in investment management and, therefore, a determinant of shareholder value. The result is also in line with the finding that companies would consider more the business confidence instead of cost of capital issues (confidence motives such as avoidance of bankruptcy, stability of profit, stable liquidity position, etc. are important considerations making investment decisions).

Finally yet importantly, we asked from companies directly to specify the importance of cost of capital management as a part of the interest rate management. More than half of the respondents (23 out of 44 companies) said that interest rate risks are unimportant in the management of a company. Therefore, interest rates could even have the influence on the management of a company, but the influence is not considered to be in the management's focus of the company. Still, it should be recalled that there are companies who consider the interest rate risk at the level of the management of a company, and some of them are actively using risk-management instruments (Juhkam, 2002). Nevertheless, mostly, these companies consider the interest rate influence through the profit/profitability of a company, rather than through the influence on the company's cost of capital. It would also be difficult to imagine companies being passive in interest rate management, but to have active follow-up of the interest rate influence on the cost of capital of a company.

Passiveness of the management of the cost of capital is in line with findings of other empirical studies (Love, 2001, pp. 30–31; Wilkes et al, 1996, pp. 68–69). According to those studies, companies prefer to use the cost of capital figures, or discount ratios, for investment analysis for a longer period. They tend to use approximate figures, which have been calculated some time ago, where fluctuating interest rates and inflation would not have an intimate influence on the discount factor of investments, or through the expected cash flows or through the expected cost of capital.

The steadiness of discount rates on investment decisions within the sample group might also be explained by the ownership structure. It should be stressed that 59% of the respondents were not a typical privately owned company – 14 out of 44 (or 32% of the total sample) were owned by the state or local municipalities and 12 out of 44 (27% of the total sample) were solely owned by foreign companies or by a domestic company. Therefore, the required rates of investment projects may also be determined by parent companies based on discount rates elsewhere. Some international companies have established a required rate of return, which is applicable in all countries they operate. In addition, there are studies stating the industry effect on the capital structure choices (Chung, 1993), which could also have influence of a low importance on the cost of capital determinants.

We still would consider the influence of ownership structure, as well as industry influence to cost of capital rather mild. There are results from other

studies where the industry structure is different (Wilkes et al, 1996), or different ownership structures (Pinegar, Wilbricht, 1989), and still those studies refer to the low importance of cost of capital on investment decisions. Therefore, the significance of the cost of capital framework should be carefully considered in academic studies, as well as on practical exercises of corporate finance.

Liquidity constraints

The first part of our study showed how important are the factors of liquidity constraints for investment management decisions of Estonian companies. In this part we analyze how important are liquidity constraints as the determinant of investment decisions in companies, based on the entire sample group. The financing preferences' approach – also referred to as the pecking order approach – is probably the most used approach for examining the liquidity constraints in companies and for the influence on the overall economy[17].

As we showed earlier in the literature review, the positive correlation between investment and generated liquidity refers to the possible financing constraints. In the current study we analyzed financing constraints in the opposite way, by asking respondents to rank their financing source preferences on managing investments. The results are shown in Table 2.2.4, where the mean of the rankings was calculated and a higher mean implies higher preferences.

Table 2.2.4. 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

The survey results indicate that internal equity is the most preferred financing source for investments, followed by bank loans and bond issues. In addition, one can see the strong relative preferences within financing options, shown in Table 2.2.4. 65% of respondents ranked internal equity as their first choice, while 16% of respondents preferred to take bank loans as their first choice and only 7% of the respondents had the first choice to issue bonds. The current survey results unanimously support internal equity as the most preferred and most used source to finance investments. Even though there are explanations, such as high transaction costs or agency costs of other sources, we would con-

[17] See for further discussion Fazzari et al (1988); Hennessey et al (2007)

sider the main reason for the high use of internal equity as being a typical example of liquidity constraints of companies. The argument of agency costs would not be proper for companies that already use bank loans, and transaction costs would not be significant on the total amount of investments. However, there is not enough data to model precisely the behavior of companies in those circumstances. 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.

There are several studies arguing the existence of liquidity constraints of companies operating in less-developed countries with weak financial systems and high agency costs (Canh et al, 2004; Mickiewitcz et al, 2004). There are other studies that see a dependency on liquidity constraints at the development stage of a company, and also being dependent on the industry (Valderrama, 2002). Typical examples are the fast-growing hi-tech companies, which face strong liquidity constraints in the phase of the product development. In our sample, there are not so many companies allowing to analyze the industry dependency of liquidity constraints, nor does our collected data structure allow for analysis of the different development stages of companies. We could refer to other studies from different countries and from different industries, referring to the high overall importance of liquidity constraints on investment management of companies (Pinegar, Wilbricht, 1989; Kjellman, Hansen, 1995; Canh et al, 2004; Tanzi, Howell, 2000).

It should also be mentioned that in 2000, Estonia significantly reformed the corporate income tax regulations, where companies are eligible to pay corporate income tax only on payment of dividends (s.c. the deferred income tax system). This could also affect dividend payout decisions of companies and their preferences to use internal equity on financing investment decisions. Still, we could argue that the influence of the corporate income tax system on the investment activity of companies is rather mild due to the relative unimportance of taxes on companies' investment decisions, as presented in Table 2.2.2 and Table 2.2.3.

2.2.5. Conclusions

The aim of the current study was to analyze factors influencing investment decisions of Estonian companies. More deeply was analyzed the interest rate influence to investment decisions, investment decisions through the framework of cost of capital, and the existence of the liquidity constraints motive on investment decisions. For this, the questionnaire was composed and sent to 200 of the biggest non-financial Estonian companies. 44 out of those 200 replied (which makes the response rate 22%), and results were discussed and analyzed within the current study. Based on the results of previous empirical studies confirming that bigger companies are less financially constrained, showing as well that the cost of capital consideration is higher in publicly traded large

companies, we refer to our findings as findings for the entire Estonian corporate sector.

The first group of conclusions is related with the importances of factors influencing investment decisions of companies. As very few studies before we also have analysed the relative importance of the investment decision factors. Using a similar research methodology as in previous empirical studies (Pinegar, Wilbricht, 1989; Wilkes et al, 1996) we rank these factors of investment decisions according to their importance. The most important group of factors on investment decisions includes the uncertainty and risk factors. Estonian companies consider uncertainty issues as the main issues in considering their investment decisions. Within the study, we did not specify the source of the risks and uncertainty, but based our analysis on different multiple choices, which were used in questionnaires; those risks are related with the investment project, rather than the failure risk of a company or the overall economy. The second group of factors important for investment management includes the liquidity factors where companies consider their investments through the framework of liquidity (or collateral) constraints. The third subgroup of factors important for investment management includes the business confidence determinants. Those determinants would reflect differently for uncertainty factors on the companies' internal readiness to invest. The importance of the cost of capital determinants, according to our study, is rather low. Broadly, these findings are in line with previous studies where the influence of cost of capital determinants is rather low (Pinegar, Wilbricht, 1989; Kjelmann, Hansen, 1995; Wilkes et al, 1996). Different to the previous studies, we have specified factors related to the business confidence and showed that the business confidence could be rather influential factor influencing investment decisions. Even though the study does not specify the reasons for that, the influence of economic crises in 1998–1999 on Estonian companies could be mentioned. It should be stressed that the business confidence determinants are, by definition, strongly procyclical with overall economic activity and, therefore, might have different levels of influence at different moments of time.

The second group of findings is related with deeper analyzed of the interest rate influence to the investment management of companies. Our special interest is the usage of the cost of capital framework on investment decisions that has been most quoted framework explaining interest rate influence to investments. First, our study shows that interest rates and interest rate management has been considered to be rather unimportant in the overall level of the management of a company. Second, companies rather consider the interest rate influence through the direct interest costs and through this, the influence on profit, than the influence to the cost of capital and through this, the shareholder value. Therefore, our study confirms similar to the previous empirical studies low importance of the interest rate influence to investment decisions. Different to the other studies we argue, that the the framework of interest rate considerations could be rather similar to direct influence then the influence through the cost of capital. Therefore, the usage of the cost of capital framework in the management of the

companies and specificily, considering investment decisions, should be carefully analyzed before the usage.

The third group of conclusions is related with the analysis of liquidity constraints' and their influence on the investment management decisions. The liquidity constraints' influence has been analysed in several previous empirical studies and most of those studies confirm the constraints' influence to investment decisions. In our study, we conclude also, that companies' preferences to use internal equity to finance investments is strongly related with the existence of liquidity constraints in corporate finance. Our survey shows that 65% of respondents ranked internal equity as their first choice to finance investments. Therefore, we consider the strong liquidity constraints existence within investment management of Estonian companies. Therefore, our finding is in line with other previous studies. Differently to other studies, our finding could be analyzed together with other previously mentioned findings based on the same sample group. The importance of the strong liquidity constraints influence to investment decisions accompanied with the low importance of the cost of capital consideration would allow to conclude, that interest rates could influence companies investment decisions externally much stronger then internally. Therefore, the interest rate should be considered rather as external parameter and could be analyzed together with other external parameters having the influence indirectly rather than directly. As several studies, analyzing monetary transmission mechanisms, pointing out that the credit channel of the monetary transmission mechanism could outperform the influence of other monetary channel influences (Amato, Gerlach, 2001; Sepp et al., 2004; Detken, 2004; Juks, 2004; Ramanauskas, 2006; Cenic, 2008) then our findings would support those statements. Therefore, whereas the strong liquidity constraints' influence is considered, the possible interest rate influence on the investments could be explained externally through the liquidity channel on monetary transmission, rather than internally through the cost of capital channel.

As we already specified in the study, there are certain limitations to our conclusions. First, our sample group is quite different from the average company. Based on these differences there could be the size effect of companies, but also, there could be the industry structure influences as well as the ownership structure influences. All these influences are discussed more deeply within the study, but they still may influence the overall conclusions. Second, determinants of investment decisions are dependent on the cycles of the economy, and the importance of the determinants is changing over time (Pereira, 1991). It should also be recalled that the current questioning took place in 2001, where the influence of the 1997–1999 economic crises were rather influential. Therefore, the interpretation of results should be in the context of the socio-economic situation of the country, otherwise these results should be taken as a snapshot in time.

2.3. Pricing behaviour and price management of companies

2.3.1. Introduction

Several studies have quoted pricing as the most efficient response to the changes in the business environment by a company. On the other hand, the financial results, such as profit/loss and costs, have been considered useful indicators for feedback on a company's performance. Therefore, there remains the question of how much companies are following the financial figures of a company in price management. To analyse the influence of financial figures on price management, overall objectives of price management should be discussed first.

The first subject discussed in pricing is the objective of the pricing. Even though the literature distinguishes short-term vs. long-term objectives, together with quantitative and qualitative objectives, most empirical studies, based on questionnaires to managers, do not distinguish them (Avlonitis, Indounas, 2005; Carson et al, 1998). Some other empirical studies argue that the short-term profit objective is the prevailing pricing objective (Meidan, Chin, 1995; Guilding et al, 2005). Some papers have found that the complexity of pricing decisions impose often the need to apply more than one objective at a time (Diamantopulus, 1991; Carson et al, 1998). Some papers have studied the discrepancy between statements about pricing and actual behaviour (Keil et al, 1999). Empirical findings show that the objective stated by managers could be profit maximization; still, managers tend to behave more in line with market share objective or client satisfaction. The wide scope of objectives, mixed by different time horizons, gives a very confusing picture of objectives on price setting.

While the pricing objectives provide the aim for action, pricing methods contain explicit steps or procedures by which companies act. Many studies do not separate distinctively the pricing objectives and pricing methods as the object of the study, arguing that the methods themselves are also containing the pricing objective (Guiding et al, 2005; Garson et al 1998). A few empirical studies confirm the dependency between pricing objectives and pricing methods, like the dominant price in the market as the objective, and pricing below competitors as the method (Avlonitis, Indounas, 2005).

The most popular pricing method among managers is the cost-plus method. The common belief is that the use of the cost-plus method indicates the profit maximization objective of a company (Carson et al, 1998; Avlonitis, Indounas, 2005). Some other studies argue that companies parallely use more than one pricing method, where cost-based methods are the most strongly prevailing (Avlonitis, Indounas, 2005; Urbany, 2001; Lere, 2000; Guilding et al, 2005). The massive use of the cost-plus method, despite the wide variety of objectives and non-linkage to profit generation, puts some doubt around the cost-plus method implementation in companies.

It has been stated that the use of the cost-plus method affects a company's pricing behaviour as follows – the increase in costs causes the increase in prices (Lucas, 2003; Pasura, Ryals, 2005; Guilding et al, 2005). This behaviour pattern of companies has often been described in different papers at the aggregated level, but not much at the company level. The usage and implementation of the cost-plus pricing method has been studied in several empirical studies, which state the dominant usage of the cost-plus method among companies (Morris, Fueller, 1989; Carson et al, 1998; Paleologo, 2004; Avlonitis, Indounas, 2005; Guilding et al, 2005), were studies were mainly carried out in very competitive business environments. Due to different findings of cost-plus pricing method usage in several case-studies and analysis of single companies, the approach to implementation of cost-plus pricing within companies seems oversimplified. Therefore, the implementation of the cost plus method at company level should be analysed more deeply. The main contribution of this paper to the literature is its presented framework of pricing management behaviour, which explains the wide use of cost-plus pricing and the principle of profit maximization at the same time. Also, the paper explains the simultaneous usage of several pricing methods such as cost-plus pricing and methods of demand-based pricing. Through the presented price management framework, there is also explained several other aspects of the price management, such as different cost-plus pricing implementation in different industries and the cost discrimination practice on the implementation of the cost-plus pricing.

The important aspect of the implementation of the cost plus pricing is the covering of interest costs as well as other overhead costs. As was mentioned previously, the simplified implementation approach is not explaining the discrimination of interest costs or other overhead costs. Even though there are some studies stating the influence of the increased interest costs to incresed inflation (Seelig, 1974), there are number of recent studies arguing for the opposite influence. Beside the wider approach to the pricing issues, the current study aims also to cover and explain the literature gap on interest costs influence on pricing.

The aim of the paper is to present a deeper look at the price management of companies through the case-study analysis. These case-studies give special attention to the managers' view of pricing procedures, pricing objectives, pricing determinants and other managerial issues related to pricing. Cases of price changes and their determinants are also analysed. The case-studies approach is rather unique in the literature of cost-plus pricing implementation and, therefore, creates an opportunity to compare results of different methodologies. Even though the sample consists only of Estonian companies, the results could be used also in other countries.

The research focus of this study is to understand the decision-making process in the price management of the companies, and investigate factors influencing them. Even though at first glance the research topic could suggest using quantitative analysis, those processes are highly unordered and company-specific, therefore it requires for in depth understanding and a qualitative

research approach. The case study approach has been preferred for distance observation (studying in-depth the financial and managerial reports, price-lists, etc.) because of the complexity of the price-setting procedure. The analysis of data is conducted in accordance with procedures of comparative case analysis (Ragin, 1994). The procedure consists of three steps. The first step is within-case analysis, conducted for each separate case to determine a direction of dependencies between studied variables on each individual case. The second step is to compare results of individual cases in order to find cause-effect dependencies between variables. The final step compares results with theoretical debates to draw some conclusions or hypothesis.

The rest of paper is organized as follows: a comprehensive review of the literature on pricing objectives and pricing methods is presented. It is followed by the description of the methodology and competitive industry analysis. Thereafter, the case-study along with the cross-case analysis and conclusion is presented.

2.3.2. Literature review

The literature review has been limited to the studies on companies operating in competitive markets. Markets with monopolies, oligopolies, with low competitive environments, or with any other market distortions have been excluded. The literature review has been organised in the following way. First, pricing objectives are discussed. Pricing objective is important for companies in the context of overall management behaviour, where objectives explain the motivation of companies in their decision making processes. Second, different pricing methods have been analysed where the method chosen by companies could be related to the pricing objective. Finally, the cost-plus method, as the most used pricing method, has been analysed. Even though the cost-plus method has wide use in companies, there is still not enough specific knowledge on how companies implement the method in the case when costs increase.

Pricing objectives

The pricing objective provides the direction, or the purpose, of the pricing decision. Most of the studies that distinguish the pricing objective from the pricing method argue that the objective for pricing is profit maximization (Carson et al, 1998; Urbany, 2001; Guilding et al, 2005; Hunt, 2002; Lere 2000; Avlonitis, Indounas, 2005). However, it is interesting to mention that the objective of profit maximization has been from time to time criticized, and replaced by generating the sufficient amount of profit (Meidan, Chin, 1995; Guilding et al, 2005).

Despite generating profit, companies quite often have other objectives, where not all of them are compatible with each other (Keil et al, 2001). The objective of sale maximization, for example, could lead to lower profit. It has

been explained by hysteresis, stating that managers tend to misinterpret some phenomena, such as the elasticity of prices or the price awareness of customers (Urbany, 2001). Also, it was stated that some industries just have different objectives for pricing (Guilding et al, 2005), or different companies have different pricing objectives (Carson et al, 1998). This can also be explained by different time horizons of the price attainment (Avlonitis, Indounas, 2005).

A number of studies consider profit maximization as a too narrow-minded objective of pricing, which is more common for SMEs. An explanation of limited pricing objectives is explained by limited use of knowledge and management capacity (Paleologo, 2004; Diaz, 2006), the need for reliable data for decision making (Urbany, 2000a; Avlonitis, Indounas, 2005), cost consideration as the philosophy of entrepreneurship (Carson et al, 1998), or highly competitive business environments with low entry and exit barriers (Kohli, Jaworski, 1990; Diamantopulus, 1991; Guilding et al, 2005). There is some discrepancy between theoretical studies, which argue for the multiple objective approaches of companies in pricing, and empirical studies, stating the dominance of the profit maximization objective in price decisions. It should be recalled that several studies do not refer directly to the pricing objective, but use the domination of cost-plus pricing implementation as the explanation of profit maximization objectives of companies (Avlonitis, Indounas, 2005).

Pricing methods

Pricing method is the "road map" of pricing decisions, consisting of explicit steps or procedures by which companies arrive at pricing decisions. Pricing methods can be grouped into the following three categories (Avalontis, Indounas, 2005).

Cost-based pricing. These methods are based on some quantitative/financial indicator that indicates pricing. The most quoted cost-based method is cost-plus method. Cost-plus pricing has been considered one of the oldest pricing principles, where historical evidence on their application dates back to the end of the 18th century (Avalontis, Indounas, 2005). The principle of pricing was that the price should cover costs associated with manufacturing, marketing and distribution with the addition of desired profitability. Such an approach has been criticised on many aspects. First, it is extremely difficult in practice to identify true costs of products. In many cases companies, having joint costs or fixed costs, cannot easily allocate these costs to a single product. Nowadays cost-plus pricing has been considered as a longer-run pricing method where costs of a company should be covered and some reasonable profit should be created. It should be mentioned that modern companies have a rather large product portfolio, with different products for customers (Lere, 2000; Urbany, 2001) which gives various opportunities to build up specific pricing strategies for separate products, and still have a cost-plus pricing strategy for the product portfolio.

Second, there are problems with the allocation of costs, especially overall costs. As an example, it could be the case where overall costs could be allocated based on previous units of the product, based on actual units of product, based on optimal units of product or based on maximum unit of the product. There are several other cost allocation dilemmas (Lere, 2000) which should be described, before the implementation of cost-plus pricing.

Other cost-based pricing methods are less popular among managers. Methods like marginal pricing, where the company sets the price at the level of marginal costs, could be popular among scholars, but get little support by the managers of companies (Lere, 2000; Avlonitis, Indounas, 2005; Garson et al, 1998).

Competition-based methods. These methods give guidelines on behaviour in competitive surroundings. A few rules of thumb which are widely used, but not much studied, are pricing following the dominant companies' prices in the market, and pricing below the competitors' prices (Urbany, 2001). These methods are discussed widely in most of the studies concerning pricing policy in SMEs. These strategies are discussed more in the case of companies providing several products or services. The composition of the product portfolio and competition determines the pricing of each product.

Another competition-based pricing method is to use the industry average return approach (Kuehl, Lambing, 1987). In an industry with many competitors it is probable that all will sooner or later have the same pricing structure. Therefore, companies would use the same pricing structure, allowing them to keep market share and industry-average profitability.

Demand-based pricing. These pricing methods are based on the value created to customers. The idea behind these methods is that the amount that customers are ready to pay reflects the value they obtain, and that could be very different from the production cost of the product. The biggest obstacle in using the value-added method is in determining the value created to the customer.

There have been studies proposing a complex method to determine the value created to the customer by dividing the provided service to the separate sub-grades and, through the pricing of service substitutes, to calculate value-added to the product. There has also been a number of studies to determine optimal pricing in certain business sectors; still, companies usually lack data on the relationship between price changes and sales volumes, the link between demand levels and costs, and responses of competitors to price changes (Urbany, 2001).

Another widely used demand-based pricing approach is psychological pricing. In some sectors customers' price awareness is very low, therefore allowing the company to establish much higher prices than the cost for the product. Two practical methods have been discussed under psychological pricing. The focus-group pricing method deals with the determination of an acceptable pricing level based on an in-depth study of the focus group (Allen,

Maybin, 2004). Another approach is the cost-point method where prices would round to the upper price limit the customer is ready to accept (Hunt, 2002).

Some studies argue that companies could successfully use "hunches" for price-setting (Blackburn, 1986). Based on these approaches, managers who have wide experience in their field of business dominantly use their intuition and experienced judgements. Therefore, pricing could be treated more as a managerial art than science.

A common empirical finding is that the most used pricing method is the cost-plus method (Morris, Fueller, 1989; Avlonitis, Indounas, 2005; Carson et al., 1998; Guiding et al, 2005; Paleologo, 2004). These studies stress the simplicity and ease in using, the main argument by users, of the cost-plus method. The use of the cost-plus method is not correlated with the size of a company, but has some correlation with the industry.

The empirical studies' results about the strong dominance of the cost-plus method contradict the most popular pricing objective – the maximization of profit. It would be rather simplified to assume that profitability could be increased by increasing prices without considering the reaction of customers, reaction of competitors or reaction of overall demand for a product. Also, it contradicts many papers concerning demand-based pricing and competition-based pricing as the main pricing tool of SMEs in a competitive economic surrounding.

Pricing influenced by financial indicators

The influence of financial indicators of a company – expenditures, profit/loss, financial ratios – on the pricing is not so obvious. Even though many theoretical and empirical studies state the influence of financial indicators on the pricing method, there is no specific explanation as to which indicators are used and on what range. In the current study the influence of financial indicators to the pricing has been analysed through the different pricing methods.

Demand-based pricing methods and competition-based pricing methods are not methods relying on cost levels, profitability or any other internal (financial) figures of a company. Both of these methods focus on external aspects of a company and, therefore, have very little to do with those financial figures of a company. The cost-plus method itself declares the focus on internal matters of a company and, therefore, could be analysed more deeply in connection with financial indicators.

The cost-plus method is often treated as the method of cost-covering in a price setting procedure (Guilding et al, 2005; Lere, 2000; Carson et al, 1998), therefore granting the required profit level to a company. Even though the method itself has been widely mentioned, there is no good explanation as to how this procedure works in companies operating in conditions of high competition. The only simplistic explanation has been brought on the aggregated level (Domowitz et al, 2001), or at the industry level (Barth, Ramey, 2000) where the overall costs are influencing companies' price levels directly.

Another important aspect is the range of costs that companies are using in the cost-plus method. Most of the studies do not refer to that aspect at all (Carson et al, 1998; Paleologo, 2004; Avlonitis, Indounas, 2005; Urbany, 2001; Morris, Fueller, 1989). Some studies point out that they use the "full-cost" approach, but without any reasoning for it (Guilding et al, 2005). The approach of "full-cost" is widely used in discussions about pricing in the aggregated level (Domowitz et al, 2001; Barth, Ramey, 2000). It was argued that cost-plus pricing is probably used more in high-competition industries; also, that the size of a company does not have an impact on the use of the cost-plus method (Guilding et al, 2005). In these studies it was noticed that the costs structure of an industry requires special attention in analysing price settings of companies, without specifying how it should be considered.

Another group of studies has focused on implementation of activity-based costing, influenced by use of cost-plus pricing in companies (Lere, 2000; Ness, Walker, 1995). Those studies stress the importance of dividing costs based on value-adding to the product or service, and point out differences of costs directly or indirectly related to production. These studies explain the pricing procedures but do not attempt to link them by previous studies, or to explain the domination of cost-plus pricing practices among companies.

2.3.3. Research methodology and data

Research method used. The research focus of this study was to understand the decision-making processes of companies and investigate factors influencing them. Even though at first glance the research topic could suggest quantitative analysis, still, those processes are highly sophisticated and company-specific, therefore it requires an in-depth qualitative approach.

The case study approach has been preferred for desk research (studying in-depth the financial and managerial reports, price-lists, etc.) because of the complexity of the price-setting procedure. As the study shows, some companies have changed their pricing approach during the period, even though prices themselves stayed unchanged. Therefore, case-study gives a much better view-point on the subject of the study – the direct approach of managers with their understanding and meaning of the situation. The data was collected and analysed in early 2007.

The emphasis of interpretation has been carried throughout the study. This allows data to be initially coded in several ways (also during the interview process), then re-analysed and interpreted as further data are gathered. The further analysis of data is conducted in accordance with procedures of comparative case analysis. These procedures can be completed in three steps. The first step is within-case analysis, conducted for each separate case to determine the direction of dependencies between studied variables. The second step is to compare results of individual cases in order to find cause-effect

dependencies between variables. The final step compares results with theoretical debates to draw some conclusions or hypothesis.

Selection of companies. Companies have been selected based on the discussion in the literature review, where companies should operate in a competitive environment, should have different cost structures and represent different industries. The first task was to select companies in competitive environments.

Several approaches were used to analyse competitiveness of companies. In order to select industries, the concentration of the net sales was followed to avoid markets with domination of a single or a few companies. The approach proxies market competitiveness with market concentration, which is used in several studies (Fritzer, Reiss, 2007). In the following table there is presented the information of some industries' concentration, where the biggest companies were grouped into three groups, by fours, and their dominance in the industry (by comparing their sales to total sale) was analysed.

Table 2.3.1. Concentration of net sales by economic activity in 2004 (mil. EUR)

Industry	First four	Second four	Third four	Total sales
Manufacturing	313	229	174	5546
(% of total sales)	5,3	4,1	3,1	100,0
Construction	340	147	92	2124
(% of total sales)	16,0	6,9	4,3	100,0
Wholesale	618	459	371	11222
(% of total sales)	5,5	4,1	3,3	100,0
Hotels and restaurants	51	19	15	319
(% of total sales)	15,8	5,9	4,7	100,0

Source: Statistical Yearbook of Estonia (2006)

It follows that these industries are competitive, without the dominance of a small number of companies. The dominance in industries still does not exclude the dominance in local markets companies operate in. It should be recalled that companies could have exclusive products, contracts, client groups, etc., which makes the estimation of competitiveness rather complicated. Therefore, the estimation of competitiveness was asked during the interviews of managers to ensure that companies would have competitive market conditions.

Another important selection criterion was to have companies with different cost structures, including companies with high financial gearing (except financial institutions) and with exchange rate exposure (companies trading outside the euro zone or quasi-euro zone). Presumably, different cost-structures appear for companies representing different industries. To avoid any exceptions, the cost structure was analysed also through the public financial reports. Last important criterion was that these companies should have stable management

(stable ownership structure, unchanged management personnel, no substantial changes in strategies, no big acquisitions or investments), at least for three years, and follow-up of monthly or quarterly financial results. As the focus of the current study was to analyse the implementation of the cost-plus pricing, the companies who are not able to gather financial information or interpret financial results should be excluded (Subrahmanyan, 2000; Palegeo, 2004).

Data collection. The research itself in the current study consisted of in-depth semi-structured interviews (Ragin, 1994) carried out with top managers of five companies in Estonia. The objective of these interviews was to allow executive managers to describe their views in relation to what, when and why they change prices. As price management can be very company specific, there was prepared a certain list of topics to be discussed rather than multiple choice questionnaires. During these interviews several issues of management were discussed, as a short history and introduction of the company; generic competitiveness of the company; the price management procedures; price management methods; the influence of financial results to price management; different cost influences to pricing, etc.

Interviews have been built up to minimise possible biased answers that can be caused by the influence of the question itself, where managers of the company tend to adapt the mode of the recipient to their views (Carson et al, 1998). This seemed to be particularly so if respondents have had technology transfer or prior knowledge in an area of discussion. Therefore, first steps were designed to get the description of the business, everyday management issues, the description of procedures and managerial tasks. Only the final part of the interviews was designed to analyse more in-depth the cost-plus method implementation and real influence on pricing.

Another aspect is the usage of terminology[18]. It was deliberately avoided to use marketing and financial terminology, where instead the slang of the company was used during the interviews. Even though it needed additional work to clear out the exact meaning of the terminology, this still gave a more relaxed atmosphere for interviews. Interviews followed a relatively unstructured pattern using the "tell me about…" approach. This approach allows respondents to describe their views on what they do in their own words, and gives the recipient a wide overview of the company. It also gives a unique opportunity for identification and exploration of the key issues, as they are revealed because of the open-ended nature of the interview itself.

Interviews were organised to discuss the following topics:

1. *business model and results:* key figures of the company; dominance in the market; customer structure; financial performance; management structure and procedures of the company;

[18] For further discussion see Grant et al, 2001

2. *price setting procedures*: what procedures have been used during the time discussed; persons involved in pricing; how regular/often pricing takes place; what determines pricing;
3. *the influence of financial figures to pricing:* the influence of profit/loss; the influence of the cost of raw material (exchange rate); the influence of other direct costs; the influence of interest rates

2.3.4. Case studies

Case 1: the hotel. This company owns and operates a hotel and a restaurant in Narva (a town in the north-eastern part of Estonia). As the company holds only 13% of the local market share and does not have a dominant position in the market, they are very focused on every customer. The company has a much diluted customer structure, where the biggest customer has brought less than 3% of revenues. The company has been active in the market since late 2002.

In 2005 the company had turnover of 401,000 EUR and made a loss of 12,000 EUR. The company had an interest bearing liabilities ratio of 0.76, which is high, compared to the industry average. Still, the highest costs within total costs were personnel costs, accounting for 38%, followed by interest costs of 26%. The cost structure has been quite stable; the turnover and profitability have improved during 2006. Financial obligations of the company are based on 6-month EURIBOR (and small amount on fixed interest rate).

The company is managed by the owner. Financial results have been reported monthly and benchmarked mainly on the previous years' results. Pricing issues have been studied more deeply, twice a year before seasons. Pricing issues have been discussed with the controller and marketing specialist. Due to weak profitability, management has desperately looked for profit throughout the entire period. Despite the fact that the company has had net loss on previous years, the operating profit has been positive.

The pricing discussion usually starts with the analysis of financial results – mainly the cost analysis based on activities. The cost structure and revenues of different activities have been studied carefully; what have been the results with the lease-out of some premises (the cafeteria and the health centre); with reorganisation of activities (the laundry and cleaning services have been outsourced). Another aspect, aside from costs of the company, is the analysis of competitors. The company has chosen two benchmarks from the local market, similar size and customer focus. The cost follow-up and the analysis of competitors are two pricing methods used in the company. Even though the company looks for profit, they have not increased prices during the three year period due to tough competition.

Case 2: the knitting company. This company is active in producing and selling knitted apparel. The company is located in Pärnu (a town in the western part of Estonia) and operates under the Knityard brand. Approximately half of the

production is sold domestically and the other half is exported. The company also operates two outlets: one in Pärnu and the other in Tallinn. The market share of the company is less than 5% in each segment of the market. The company states it has good personal relations with customers.

The company had turnover of 447,000 EUR in 2005, and a 19,000 EUR profit. The company has liabilities from banks and owner's loans totalling 96% of liabilities. The most important costs were personnel costs, accounting for 38% of total costs, followed by the raw material costs 28% and interest costs 11%. Due to the high increase in personnel costs, the company had financial losses in 2006, despite the increase in turnover.

The company is managed by one person supported by the chief-accountant and production manager. The design of the new product is outsourced. The main responsibility of the manager is customer relations including also price negotiations. Due to the seasonality of business, pricing decisions are mainly done twice a year. The price setting is accompanied with the development of new products. During that development phase they intensively discuss the price expectation of final customers, as well as middlemen's expectations. The new product should be available at that price target, which then impacts the model design (labour optimisation) and the selection of raw materials. The production manager, together with chief-accountant, reports final raw material costs and direct labour costs for each and every product. Thereafter, prices are corrected by the coefficient, which should include all other costs and some profits. The company targets minimum costs for each and every product. The launching period ends with signing contracts, where final prices are determined. Contracts do not guarantee production volumes to the company therefore all issues, including pricing, are still up for discussion at the moment of ordering. The company practices heavy discounts on quantities as well as seasonal discounts.

Case 3: the liquor trader. This company is an importer and distributor of alcoholic and non-alcoholic beverages. The company holds exclusive selling rights of many worldwide famous brands. All products have been imported. The company rents a customs-warehouse in Tallinn. Besides the selling of the products, the company provides different kinds of marketing support to those brands in the local Estonian market. Even though the company has exclusive rights for some brands, they still have market share less than 10% in all product groups they deal with. The company operates through the distributors and direct contacts with shops and Hotels-Restorans-Cafes customers (more than 100 customers).

The company had very good results in 2005 due to increasing demand (high growth in the wine segment). The company had turnover of 11.5 mil EUR and net profit of 705,000 EUR. The main costs were purchase of goods, accounting for 83% of total costs, followed by 11% of personnel costs. The amount of interest bearing liabilities was less than 50% from total liabilities, and financial costs were insignificant. The good financial results in 2006 contributed to the increasing of sales as well as profits figures.

The company is managed by three owners, each responsible for certain types of products. Due to volatile prices and currency exchange rates, selling prices are settled on an ongoing basis. The method mainly in use is the simple cost-plus pricing, even though the company has very good knowledge about the competitors' prices. Additional margin that is included to cover overall costs and give some profits is discussed four to five times per year. The setup of margin is mainly influenced by the overall competition and comparison of competitive products' prices. From time-to-time the company carries out the research on pricing of competitive brands.

The company heavily uses different kinds of seasonal and promotional discounts. These mainly seasonal discounts are initiated by shops or restaurants-bars and have already become a kind of tradition in the market.

Case 4: the construction company. The company is active in the building industry, which has grown very fast during the years 2003–2007. The company is located in Tartu even though it has been active all around Estonia (and has built a few buildings also in Riga, Latvia). The company has approximately 40 employees plus subcontractors. In the building industry the company is a middle-sized company with market share less than 2%, based on the industry and the company's turnover. The company has been in the market for more than eight years.

2005 was an excellent year for the company with turnover of 3.8 mil EUR and net profit of 578,000 EUR. The biggest costs were material costs accounting for 41% of total costs, followed by personnel costs 27% and costs related to subcontractors 22%. The company had low interest bearing liabilities – only loans from owners. The company has avoided the increase in prices for materials by contracting material purchases at the beginning of construction contracts. The company expected for 2006 the same good year, even though the salary levels increased by around 30%.

The company is owned and managed by two persons. Even though the company has been active with many clients from different locations, the main customer structure has remained the same. The manager states that the extra-value is created for the company by working with the same customers, namely, there are fewer communication problems and less financial fraud.

The pricing practice in the company has been based on contracts/proposals. Before proposing, they calculate all direct costs related to the work (material costs, labour costs, logistics, costs for subcontractors, etc). Thereafter, some amount is added, where the main component are the possible price-increases, miscalculations, etc. This also includes all indirect costs, interest expenditures and expected profit. This added amount can be from 20% to 50% from final contract price. One important component on pricing has been the benchmarking of the market. The manager admits that in recent years, benchmarking has worked quite often in the opposite way, to avoid too low pricing. Quite often the company has practiced "refusal offering," deliberately proposing very high

prices. A few times these “refusal offerings” have been accepted, creating long overtime, but also some extra profit.

Case 5: the recycling company. This company is active in the recycling business, buying and recycling different types of industrial waste. The company has a network all over Estonia and has a processing plant nearby in Tallinn. Total assets on the balance sheet are over 12 mil EUR, where some assets such as land have much higher market value than book value. The company had loans in the amount of 7 mil EUR from the mother company, with a fixed interest rate.

Due to the high demand for recycling products in the world market, the company reached turnover of 64 mil EUR, and profit of 3.2 mil EUR in 2005. The biggest expenditures were the raw material costs, accounting 77% of total costs, followed by personnel costs, 9%, and logistic costs, 8%. The company has interest bearing liabilities in the amount of 8 mil EUR, still, the interest costs to the total costs are less than 3%. The company expects strong financial performance also in 2006.

Due to the small size of the Estonian recycling market, the company has the dominant position in the market counting its market share to be close to 50%. After the enlargement of the European Union, the boundaries of the market have enlarged, as well as creating additional competition. In the last two years there have appeared more competitors, some of them already well-known in the Baltic Sea region. Most of the recycled products are exported. Recycling products are traded in a liquid global market, therefore, the company is strongly exposured to international price risk together with currency risk. To fight with growing competition the company recently launched different logistics service packages to provide additional value-added to customers. Also, there was introduced price discrimination to different customers.

Due to the high fluctuation of prices in the world market, the company is forced to correct prices weekly. With many customers with whom the company has signed cooperation agreements with, it was agreed a pricing formula, including weekly pricing corrections based on international price-levels. Otherwise, the company follows competitor behaviour and its own purchase volumes. If the world market prices are growing or dropping, but competitors do not react, the company keeps the price level. Other costs, like salaries, fuel costs, maintenance and etc., are included in pricing through the mark-up calculated as the cost per sold ton. If these costs increase, they raise the mark-up. Interest costs are not directly influencing prices; the company internally reports the EBIT.

2.3.5. Cross-case analysis

On a longer term objective (on a three year time-frame), all companies mentioned their orientation to profit on pricing decisions. It would be surprising if the answer would be something else, or the opposite. The recycling company and the hotel stated another additional long-term objective for pricing – to keep the market share; the knitting company was considering the customers' price expectations. Even though all companies mentioned their orientation to be profits, none of them considered the profit or the loss in their pricing decision.

The short term objectives in pricing would be more sophisticated. Even though companies stated the profitability of a company as the main objective, it was unclear what they meant with it. The construction company indicated that their biggest concern is to make a deal, and the cost calculation is the tool to explain the price proposal. The hotel and the knitting companies stated the importance of customer relations. The recycling company and the liquor trader mentioned the aim of having competitive prices. Therefore, companies having different short-term objectives were still concerned about the profitability of the company. This also explains the simultaneous use of many pricing objectives in the short time horizon mentioned by several previous studies (Diamantopolous, 1991; Morris, Fueller, 1989; Meidan, Chin, 1995; Avlonitis, Indounas, 2005). Definitely, these different objectives cannot be considered as contradicting objectives, giving different guidelines to pricing decisions.

The price management, even in small companies, was more sophisticated than suggested in the literature (Carson et al, 1998; Avlonitis, Indounas, 2005; Guilding et al, 2005). The price management in studied companies was organised in two levels. The first level pricing (s.c. quick pricing) is based on the raw material price and the fixed amount of add-up. This method was very much used in companies with a high influence on raw materials – like the recycling company, the liquor trader. It also explains the different use of the cost-plus pricing method in different industries (Guilding et al, 2005). It should be mentioned that companies with high raw material costs followed more often also the competitors' behaviour in price management. It would be natural to assume that costs which are dominant in the companies' cost structure, such as raw material prices, are easily accounted for the unit of product costs. Therefore, companies with low value-added or companies with a single product or service would be natural users of the cost-plus pricing method (Bloch, 1992; Kardasz, Stollery, 1998). Whereas the domination of such types of companies is higher within SMEs than in bigger companies, this could explain the high use of cost-plus pricing among SMEs. Should be noted, that costs, which were often more dominating then the raw material costs but having indirect influence to the product costs, were rarely used in the quick pricing decisions (the knitting company, the construction company).

In other companies, where the raw-material margin was important but not so dominant (the construction company, the knitting company), the cost-plus pricing method in quick pricing also covered other direct costs. In those

companies the cost-plus method was always accompanied by other methods, mainly demand-based methods, but also by competition-based methods. The same cost-structure and client-structure could be followed in the service sector, which then explains the use of the cost-plus method in the case of customer-oriented objectives.

The second-level price management (s.c. long-term pricing) existed in all of these companies. These pricing meetings were regularly planned, well-prepared and visited by different employees of a company with different viewpoints. In those meetings profitability of previous periods was analysed, along with the cost structure (in all cases), the competition situation in the market (in all cases) and the customers' price expectation (the knitting company, the hotel, the recycler). Even though the costs were very much discussed in those meetings, the cost-plus method itself was rarely used in real pricing. Therefore, it makes sense to assume that the use of the cost-plus method approach, together with other pricing methods, turns out to have more internal influence as cost-restructuring or cost-cutting rather than as an influence on the real prices.

In some companies using intensively the capital inputs, where the cost structure is dominated by financial costs or depreciation (costs related with long-term investments to real assets), only long-pricing decisions were made. Despite the fact, that the increase in the interest rates would cause the higher cost level in every company in a capital-intensive industry, companies (the hotel) do not consider these costs in pricing as those companies (the liqueur trader) in raw-material intensive industries. Therefore, the domination of the cost in the cost structure of the industry cannot be considered as the main explanation for the cost influence to pricing. The usage of the cost-plus pricing depends on industries where capital-intensive industries tend to use less the cost-plus pricing then raw-material intensive industries. This is in line with findings of previous studies, that hotels tend to price their services based on competition-based methods (Guilding et al, 2005).

2.3.6. Conclusions

According to the several empirical studies, the cost-plus pricing is strongly dominating within SMEs. The cost plus pricing itself has been presented in several studies as the increase of prices to cover the increase of costs. Therefore, the cost plus pricing has been considered also as a tool for companies to maximize (or maintain) the required level of profitability. Whereas most of the previous empirical studies are concluded by the questionnaire method, the current study has used the case-study method using semi-structured interviews as a tool to collect pricing data of companies.

The current study has shown that the use and influence of the cost-plus pricing method is more sophisticated than presented in previous studies. First, many companies use the two-level price management, where some part of the

pricing decisions are made rather often (to follow flexible raw material prices, etc.), and these decisions are dominantly based on the cost-plus method. Besides the "quick pricing" there is another part of pricing decisions which are made more seldom, and is mainly not based on the cost-plus method. Therefore companies using dominantly the cost-plus method, doing daily or weekly quick-pricing decisions, might still be very concerned about competition and the overall response of customers. Also, according to the study, companies may consider price changes using simultaneously several pricing methods. Therefore, the dominant use of the cost-price method cannot be interpreted as the cost-plus pricing method domination on pricing decisions.

Another important finding of the current study is related to the implication of cost-plus pricing. As the study shows, the costs used in the pricing consideration are strongly discriminated. The basis for cost discrimination is their relative importance to the final price and their direct or indirect nature to companies' products or services. Therefore, the costs, which might be rather significant in the overall cost structure, might still have rather weak (or missing) influence on final prices, even if a company uses cost-plus pricing principles. This finding might explain differently the dependency of the cost-plus pricing method usage within different industries. Different to the previous studies which explain this phenomenon by different cost structure in different industries (Diamantopulus, 1991; Lere, 2000; Guilding et al, 2005), the current study stresses the importance of the costs' nature. Therefore, there could be very different cost-plus pricing method usage on the same industries in different countries on the different level of customisation.

The cost discrimination on implementation of the cost-plus pricing method would explain the declining importance of the exchange rate influence in determine the inflation (Dabusinskas, 2002; Sepp et al, 2004). There is a strong impact of the raw-material type of costs on the prices in the early stages of development, whereas in a country where the value-added industries dominate the economy, this would obviously decrease the efficiency of the exchange rate channel (reducing the exchange rate influence to inflation). Therefore, with the further development of the economy the influence of the exchange rate channel is naturally diminishing also in Estonia (Sepp et al, 2004), as well as in other transition countries (Amato, Gerlach, 2001; Coricelli et al, 2006b). The exchange rate has a strong impact on pricing for companies where the added-value to the imported product is rather slim. As long as value-adding is increasing and the cost structure of whole economy is changing the impact of exchange rate influence diminishes, diminishing the efficiency of exchange rate channel of the monetary transmission mechanism.

According to several studies distinguishing pricing objectives and pricing methods, the most popular pricing objective is related to the profit maximization. Beside the profit maximization objective there are studies referring to multiple objective practices (Diamantopoulos, 1991; Mitra, Capella, 1997; Keil et al, 2001) were beside the profit maximization several other objectives are presented. As it turns out from several empirical studies, the multiple

approaches are rather mixed and contradictory between the separate approaches (Meidan, 1996; Urbany, 2001a). The results of the study show that the wide range of objectives are much better organized than has been expected. All companies within the study pointed out the strong orientation to profit maximization in the long run, where in short-run they would face some obstacles. This is in line with the findings of other studies of pricing objectives (Diamontopolus, 1991; Avlonitis, Indounas, 2005). The wide spectrum of short-term considerations within the pricing behaviour would indicate complexed dilemmas of companies in what they face in their price settings and use of multiple pricing methods. Also, the assumption that the pricing method that companies are using indicates their objectives (Carson et al, 1998; Guilding et al, 2005) is not valid when the proper distinguishing between the short-term tasks and long-term objectives is made.

3. DISCUSSION OF RESULTS AND CONCLUSIONS

3.1. Validity of research propositions and discussion of results

The current dissertation focuses on the interest rate influence on the behaviour of economic subjects – pricing and investment behaviour of companies and borrowing behaviour of households. The subject of the dissertation does not, obviously, cover the full range of behaviour of economic subjects, which was discussed in the introduction part of the dissertation. Instead of a wide range of behaviour aspects, the focus is on three research questions, which cover most influential behaviour aspects of economic subjects in the context of interest dependency. The current chapter provides an overview of empirical studies through the explicit focus on propositions argued and presented in previous parts of the dissertation. The discussion of results is accompanied by implications to the theory discussed in the theoretical part of the dissertation. Through a wider approach, the importance of the interest rate influence on the behaviour of economic agents also becomes more obvious. The chapter is organised based on the three research tasks presented in the introduction part of the current dissertation.

Results of empirical findings about the propositions' are presented in form of rejected or supported criterias. Still, there are several propositions where the third option is used – partially supported – which indicate categorisation, where the several aspects are different to those which were discussed in theoretical part of the dissertation. Also, propositions which were formulated too broadly are deemed as partially supported within this subsection, because the argumentation for the proposition might be something different, as revealed by the analysis.

3.1.1. Determinants of borrowing behaviour of private persons

The first research task was to find the determinants of financial behaviour of private persons in Estonia. To study the subject, four propositions about the borrowing activity of households in Estonia were made, which were studied through the empirical study presented in first chapter on the previous part. The summary of proposition results from the first research task is presented in Table 3.1.

Table 3.1. Results of the study propositions on determinants of borrowing activity of private persons

RT1: Borrowing behaviour of private persons	Results
P1a: Low interest rates are not among the main factors of the credit growth	Supported
P1b: The growth of consumption is not the main factor of the credit growth	Partly supported
P1c: Financial behaviour of private persons is strongly influenced by interest rates	Rejected
P1d: Risk groups are determined by attitudes and financial behaviour	Supported

Source: compiled by the author

Proposition P1a includes the assumption that the low interest rates alone are not sufficient to determine the credit growth. Even though during the period 2000–2007 interest rates had significantly decreased in the early part of the period (Eesti Pank 2; see also Appendix 4), and borrowing had become affordable to many people, only low interest rates would be not enough to explain credit growth. There have been several empirical studies referring to the strong interest rate determination of borrowing activity (Meltzer, 2000; Catte et al, 2004; Mehrling, 2005; Mishkin, 2007), even though the low expansion rate of credit growth is assumed.

The interest rate sensitivity in borrowing behaviour was studied through the direct questionnaire of private persons. 5.8% of respondents were interest rate sensitive in their borrowing decisions, which would indicate the low importance of interest rates in the borrowing behaviour of the average private person. Therefore, the interest sensitivity in the total sample group is expectedly low, and the interest rate consideration on borrowing decisions is rather insignificant. The determinants of borrowing decisions are shown in the following table, where only respondents with credit exposure are included.

Table 3.2. Determinants of borrowing decisions (persons with credits)

Determinant	No of respondents	% from total group
Urgent need for goods/services	90	52.0%
Increase of income/salary	22	12.7%
Favourable price level	20	11.6%
Favourable economic climate	11	6.4%
Favourable interest rates	10	5.8%
Advertising	5	2.9%
Other	15	8.7%

Source: 1st empirical study

To test the significance of the hypothesis about the low importance of interest rates determining the borrowing decision, the two-proportion Z-test was performed. The testing hypothesis was stated through the alternative hypothesis; the increase of income/salary is more influential determinant then the favourable interest rates. If the test is positive, then there are at least one determinant outperforming the favourable interest rate and therefore the alternative test hypothesis can be supported. The results of the test were as follows:

pooled sample proportion:	*p = 0.0867*
standard error:	*SE =0.0221*
Z-score statistics:	*Z = 2.6145*
one-tailed probability:	*P(Z) =0.9988*

Based on *P(Z)* value, the probability that *Z*-score is higher than 2.6145 is 0.9988 and the alternative hypothesis is supported. Therefore could be stated, that at least one determinant of borrowing behaviour is more significant and the hypothesis of low interest rates could be rejected.

The proposition P1b includes the importance of consumption as a determinant of the credit growth. In few empirical studies the trade balance (especially trade deficit) has been considered the source of additional borrowing in the economy (Duenwald et al, 2005; Coricelli et al, 2006a, Sõrg, Tuusis, 2009b). There are few empirical studies which have tested the trade deficit influence to the credit growth in Estonia but the influence has been mild or non-existing (Coricelli et al, 2006a, Sõrg, Tuusis, 2009b). Should be noted that those studies have used GDP to proxy income, but also consumption might be influenced by GDP (UN HDR).

The consumption motive was tested in the empirical part of the dissertation. Based on the determinants presented in Table 3.2, one can see the dominance of the consumption motive in borrowing behaviour. According to those results, the consumption motive is the most important motive for the borrowing. To test the significance of the consumption, the following two-proportion Z-test was performed. First, there was tested the consumption motive significance against other motives of borrowing and this test was rejected even in 15% significance level. Therefore, the consumption motive alone cannot be considered the determinant of the credit growth. Second, the consumption determinant was tested against variables of the Forward Looking Theories of Consumption. The testing hypothesis was stated that the consumption is more influential determinant then the favourable interest rates and the income/salary level combined. The results of the test were as follows:

pooled sample proportion:	*p = 0.3525*
standard error:	*SE =0.0375*
Z-score statistics:	*Z = 8.9257*
one-tailed probability:	*P(Z) =0.99997*

Based on *P(Z)* value, the probability that *Z*-score is higher than 8.9257 is 0.999 and the hypothesis is supported. Therefore could be stated, that consumption motive on borrowing behaviour is more significant then the variables of the Forward Looking Theories of Consumption.

There are several explanations for these contradictions with some previous studies (see e.g. Coricelli et al, 2006a), where the trade deficit and GDP has been used to proxy consumption and income. First, it should be recalled that the trade deficit includes, besides private consumption, a significant amount of consumption by companies (Farrell et al, 2004; Sõrg, Tuusis, 2005). Also, the influence of services might be significant in a small, open economy such as Estonia on the overall consumption balance, which is not included in the trade deficit figure. Secondly, the credit growth was also tested by using foreign indebtedness (Sõrg, Tuusis, 2009b) and, therefore, financial resources used for consumption are incomplete. The complete set of monetary resources should also include portfolio investments and FDIs, where the FDI influence to the total foreign inflow is rather significant in Estonia (Sõrg, Tuusis, 2005). The third reason for this might be a methodological and data limitation, where the total sample group used in the empirical study of current dissertation does not have necessary representatives to be comparable with other empirical studies. Besides the fact that studies results are achieved in a different time period, there might be a discussion on the use of GDP as a proxy for income (Calza et al, 2003; Fritzer, Reiss, 2007), as well as a proxy for consumption (UN HDR).

Proposition P1c assumes that the interest rate influences the overall financial behaviour of private persons. This proposition is derived partly from the Forward Looking Theories of Consumption, where intertemporal consumption is determined by the interest rates and partly by assumptions of the rationality of private persons. The proposition was tested in the empirical part of the dissertation and was rejected at the total sample level. According to study results, private persons do not consider interest rates and financial costs in their financial behaviour and in the consumption of financial products, where some of the results are expressed in Table 3.3. It should be mentioned that a change in interest rates, which is presented in the questionnaire cases, has short-range fluctuations which limit the overall conclusions of the study. Still, the study results are applicable in the range of interest rate fluctuations which is valid in Estonia within the last ten to fifteen years (Appendix 4). The study results are in line with other empirical studies (Wadhwani, 2002, pp. 7–8; Campbell, 2006, pp. 2–4), where the rationality of private persons using financial products, and the optimality of intertemporal preferences are questioned. One of the outcomes of myopic behaviour and irrational decisions, besides the complexity of financial behaviour of private persons, is a poor education and inefficient knowledge of financial matters (Kempson, Whiley, 1999; Whiley, Brooker, 2004; Collard, Kempson, 2005; Weinberg, 2006; Campbell, 2006). The aspects of poor knowledge have also been analysed in the empirical study, where some general results are brought out in the following table 3.3.

Table 3.3. Some responses of financial behaviour from respondents

	mean	st.dev	Z test*
Few hundred kroons additional loan payment is not a problem for me	2,4424	1,4066	1
I know exactly my loan interest rates	2,8271	1,4524	0,979
I have recently changed my consuming habits due to higher interest rate	3,8770	1,2707	0
When the interest rate will increase by 1%, I shall change my consuming habits	3,8974	1,2170	0
Interest rates have increased significantly within the last two years	2,2727	1,0340	1
I know what EURIBOR means	2,9223	1,5291	0,814
I have recently changed my consuming habits	2,9565	1,3665	0,716

* Z-test has been performed against the neutral answer (by Likert-type 5-level scale the μ_0 is 3)
Source: 1st empirical study

According to the results presented in Table 3.3, the respondents are well aware of the money market development and their interest rates (with a 0.01 and 0.05 level of significance, respectively). Even though the interest rate is well known for respondents, the EURIBOR as the basic financial term in credit contracts in Estonia (Eesti Pank 4) is not well known. This can be explained by the relatively low amount of borrowed money of the total respondent group – 76.9% of respondents have reported their financial obligations as less than 500,000 eek (32,000 euros). Usually, consumer credit, leasing, catalogue credits, etc., has a fixed interest rate and, therefore, is not directly related with interbank quotations. It is also important to notice that respondents have not changed their consuming habits due to higher interest rates, nor in the situation where interest would increase by 1% (on the level of 0.01 significance). The same behavioural situation, presented indirectly – would a few hundred kroons' additional loan payment per month be a problem for respondents – shows that interest rate increases would not influence the behaviour of respondents (on the level of 0.01 significance). These results indicate that the financial behaviour of private persons is not determined by the level of knowledge or education, but rather is influenced by the attitudes on borrowing and irrational expectations of intertemporal consumption.

Despite several explanations, as the low overall level of borrowing, or low amplitude of expected interest rate fluctuation, the interest rate does not have a significant influence on the overall consumption. This finding could seem controversial but is still quite often referred to in the recent literature of financial behaviour of private persons (see e.g. Wadhwani, 2002; Weinberg, 2006; Campbell, 2006). Due to the complexity of financial problems of households, including a long finite time horizon, the holding of illiquid assets, facing

different constraints, having important nontradable assets and being influenced by complex taxation, all challenge the assumption of ideal and actual behaviour. This would lead to abandoning the framework of revealed consumption/saving preferences, and add for consideration that households may not express their preferences optimally (Campbell, 2006).

The last **proposition** of borrowing behaviour by private persons, **P1d,** assumes that risk-groups are rather defined by the behaviour characteristics and attitudes rather than *ad hoc* characteristics as income, nationality, age and employment. There are several empirical studies about risk-group behaviour, stating the determinants of risk-groups as low income (Kempson, Whiley, 1999), different age groups – predominantly young people (Lehtinen, 2007), national and ethnic minorities (Kalafatelis et al, 2005), and occupational status proxied by unemployment (Kempson, Whiley, 1999). According to the methodology used in the empirical study, the interest sensitivity based on the Forward Looking Theories of Consumption, can be considered a decisive criteria to determine those risk groups (Calem, 1995; Gross, Souleles, 2001; Yang, 2006) and, based on correlation analysis of different criteria of the total test, the results were formulated. The selection of interest rate sensitivity of respondents has been made based on the question – have you recently changed your consuming habits due to the higher interest rate? To compare interest sensitive respondents with general descriptions of the total sample group, it becomes obvious that, generally, the characteristics of those samples are identical. The main differences come from male respondents (45.8% in the interest sensitive group compared with 52.1% in total sample), and self-employed persons (20.8% in the interest sensitive group compared with 16.3% in the total sample). Whereas the questionnaire didn't include the question of income of respondents, the proxy for income has been taken as the average size of the loan, where 67.6% in the interest sensitive group have taken loans up to 500,000 eek, compared with 76.9% in the total sample. Those results could indicate the interest sensitivity dependency of income and, through this, define the risk-group based on lower income. Still, the interest sensitivity cannot be taken as an *ad hoc* proxy for risk-group determination, and interest-immune persons cannot be considered as the risk-group persons (Tuusis, 2010), where the interest sensitivity of consumers could indicate their consumption sensitivity to external influences. As the comparison of overall determinants such as national minority, age, employment (also as a proxy for income), there were no differences between these two respondent groups. The main differences between those groups come from the question where respondents were asked to describe their overall financial behaviour and the characteristics of this behaviour. In the following table there has been presented some results of this analysis, where the Z-test has been performed against the mean of the total sample group μ_0.

Table 3.4. Examples of financial behaviour of interest sensitivity respondents

	mean	μ_0	Z test
I consider myself frugal	2,100	2,446	0,996
In money matters I feel myself confident	3,563	3,026	0,007
Often I have spent my money before I receive the salary	3,484	2,666	0,000
A few hundred kroons additional loan payment is not a problem for me	2,813	2,442	0,047
I know exactly my loan interest rates	2,191	2,827	0,999
When the interest rate will increase by 1% I shall change my consuming habits	2,938	3,897	0,999
I have recently changed my consumption habits	2,521	2,956	0,985

Source: 1st empirical study

Behaviour analysis shows that interest rate sensitive respondents have more responsible consuming habits – they have, on average, corrected more often their consuming habits as compared with the total sample group, as well as have corrected their consuming habits due to the external environment change. On the other hand, interest sensitive respondents are more frugal and value even a small amount of money. Focusing more on money matters makes them better planners in money matters. A contradiction based on confidence in money matters (a higher amount of interest sensitive respondents feel less confident than total sample group) can be explained by an overall confidence, and is not related with the real competence of respondents (Kalafatelis, 2005). Even though the behaviour aspects have been considered important in financial behaviour and borrowing (Livingstone, Lunt, 1992; Kalafatelis et al, 2004; Stone, Maury, 2006), the behaviour characteristics as the main determinant to identify risk-groups have not seen by the author before in literature.

3.1.2. Determinants of investment activity of Estonian non-financial companies

The second group of propositions was related with the second research question to find the determinants of investment activity of companies in Estonia and determine the role of the interest rate on it. Even though the neoclassical investment theory states the importance of cost of capital determinants in investment decisions, several empirical studies found other determinants outperforming cost of capital determinants (Kjellman et al, 1995; Wilkes et al, 1996; Bopkinet al, 2009). Within the theoretical discussion of investment determinants three propositions were stated, which were tested and the results are presented and discussed in this subchapter. The summary of the proposition results about the second research task is presented in Table 3.5.

Table 3.5. Results of the propositions about investment activity

RT2: Determinants of investment activity	Results
P2a: Cost of capital determinants has not strong influence to investment decisions	Partly supported
P2b: Cost of capital framework is the main concept used in the financial management of companies	Rejected
P2c: Liquidity constraints have strong influence to investment decisions of companies	Supported

Source: compiled by the author

Proposition 2a, assuming the relative unimportance of cost of capital determinants in investment decisions of companies, is derived mainly from findings of several other empirical studies (Bernake, Blinder, 1988; Oliner et al, 1995; Kjellman et al, 1995; Guiso et al, 2002; Gilshrist et al, 2008; Bopkin et al, 2009). Even though there is strong theoretical support for the importance of cost of capital components in investment management, through the context of shareholder value maximation, the empirical studies focusing on determinants of investment decisions find the cost of capital determinants to be rather unimportant. The proposition was tested in empirical part of the dissertation, where it was found that cost of capital determinants are one of the lowest ranking groups in investment considerations' frameworks. Results of the relative importance of determinants affecting investment decisions found in empirical part are shown in table 3.6.

For a better interpretation of the results shown in table 3.6, the determinants could be grouped as follows: cost of capital determinants (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 the determinants is the internal behaviour motives of companies, such as their vision of the future or confidence, their cost of capital determinants, their risk evaluation and their financial ability constraints. Results are presented in Table 3.7, where the rank has been calculated as the average mean of the total group.

Table 3.6. Relative importance of factors and principles affecting investment decisions 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
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.
Source: 2nd empirical study

Table 3.7. Relative importance of the 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 confidence determinants	5	3.794
Cost of capital determinants	3	3.087
Other ungrouped determinants	4	3.053

Source: 2nd empirical study

As can be seen, the factors related with uncertainty and risks is the most important consideration in investment management, followed by factors related with liquidity determinants and business confidence determinants. Based on the multiple choices within the questionnaire, it becomes obvious that those risk and uncertainty issues are related with the investment project rather than with failure or bankruptcy risk of the company or with overall business confidence.

As the rank's differences between these groups of factors are relatively small, and the number of determinants within some group of factors is small, the ranking of groups could change, including more characteristics into the list of multiple choices. Even though it could be stated that the investment management framework is related with uncertainty, liquidity constraints and business confidence are important among Estonian companies. Despite the small sample group of companies, the t-test was performed to test the significance of the hypothesis about the low importance of cost of capital determinants. The testing hypothesis was that cost of capital determinants are less significant then other groups of determinants. The t-statistics were found using the importance ranks of other group of determinants where the cost of capital determinants had μ = 3.087 and σ = 0.488. All three tests were negative at the 0.1 significance level and therefore the test hypothesis should be rejected. It should be noted that the tests' results are highly dependent on the size of the sample. Even though the test results were negative and hypothesis should be rejected, the overall importance of other factor groups and the size of the sample group would allow to mark the hypothesis result as partly supported.

The low importance of the cost of capital framework is in line with other empirical studies. One explanation for the low importance of the cost of capital determinants could be the fact that the current sample consists of only 11% of publicly traded companies and could, therefore, be biased towards the inefficient feedback of the capital market and shareholder value. In addition, there are many companies owned by local municipalities or solely by other companies where managers would consider investment decisions rather differently than managers of independent companies (Hoshi et al, 1991; Goergen, Renneboog, 2001). Still, the low importance of the cost of capital framework is viable in other empirical studies were the sample consists only of publicly traded companies (see e.g. Bernake, Blinder, 1988; Oliner et al, 1995; Love, 2001; Tevlin, Whealan, 2003; Schaller, 2006). Therefore, the reasons, as to why costs of capital determinants have a low importance, need further analysis.

Proposition 2b assumes that the interest rates are considered in the management of companies through the cost of capital framework rather then directly or through other management frameworks. Taking into consideration the theoretical framework of shareholders' value maximation (Hall, Jorgenson, 1967; Fazzari et al, 1987; Gilshrist, Himmelberg, 1998; Love, 2001; Schaller, 2006), it was assumed that the interest rate as a cost of capital determinant influences the investment decisions. The framework of interest rate influence on investments works through the interest rate influence on the cost of capital and through the required rate of return. If a company does not adjust its cost of capital in phase with low interest rates, it cuts out potentially profitable investments, where in the opposite case, if a company does not adjust its cost of capital in the high interest rate phase; it lowers substantially the wealth of the owners of the company. The second empirical study analyzes the interest rate management on investment decisions. For a better understanding of the proposition, the motives

of interest rate management within the company should be analyzed. Within the study, two different questions were asked in analyzing the interest rate influence on the management of companies.

First, respondents were asked to specify how they would interpret possible interest rate risk in their company. Forty one companies out of forty four considered interest rate risk as a possible interest cost influence on the profitability of the company. Only three companies considered interest rate risk as a determinant to the cost of capital, whereas only two were concerned about possible influence on their share price. This result would indicate that most Estonian companies would consider interest rates as a determinant of the profitability of the company, and interest rate would rather influences the free cash-flow of company then has influence to the cost-of-capital of the company.

The second question was to specify the target of the interest rate management. 12 companies (36% of respondents) answered this to be the direct interest costs, six companies (18% of respondents) answered the profit/profitability of the company and only one company mentioned the influence of interest rates on the company's investments. 14 companies out of 44 did not specify the target of interest rate management. This result is in line with the first question, that companies are dealing with interest rates as a determinant of interest costs and, therefore, determines the profitability of company. Interest rates are not considered as a determinant of cost of capital in investment management and, therefore, determinant of shareholder 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 such as avoidance of bankruptcy, stability of profit, stable liquidity, etc.).

Passiveness of management of cost of capital is in line with findings of other studies (Wilkes et al, 1996, pp. 62–63; Bopkin, Onumah, 2009, pp. 139–140). Companies prefer to use cost of capital or discount ratios for investment analysis for longer periods of time. They tend to use approximate figures, which have been calculated some time ago, where a lower interest rate and lower inflation would not have intimate influence on the discount factor of investment cash flows, or to the cost of capital. The stickiness of discount rates in investments is in line with some studies of risk-taking channels of the monetary transmission mechanism (Amato, Gerlach, 2001; Borio, Zhu, 2008), where the stickiness has been related to the managers' confidence and expectations about the future business perspectives.

Proposition 2c states the strong liquidity constraints' influence on investment decisions of companies. One of the possible tests of existence of liquidity constraints in investment decisions of companies is the strong dependency of internal resources (Nielsen, 1999; Kohler et al, 2000; Valdemarra, 2004), which is also used in the empirical study of the current dissertation. Survey results indicate that internal equity is the most preferred financing source of investments, followed by bank loans and bond issues. 65% of respondents ranked internal equity as their first choice, while 16% preferred to take bank

loans as a first choice and 7% had the first choice to issue bonds. Study results unanimously support internal equity as the most preferred and most used source to finance investments. Even though there are explanations, such as high transaction costs or agency costs of other sources (Fazzari et al, 1988; Hennessey et al, 2007; Clearly et al, 2007), the high usage of internal equity is a typical example of liquidity constraints of companies. The argument of agency costs would not be proper for companies where they already use bank loans, and transaction costs would not be significant on the total amount of investments. On the other hand, there is not enough data to model precisely the behaviour 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. The existence of liquidity constraints would also be in line with other findings as the set of determinants of investment behaviour, as well as other empirical studies (Canh et al, 2004; Tanzi et al, 2000).

There are several studies arguing for the existence of liquidity constraints of companies operating in less-developed countries with a weak financial system and high agency costs (Cahn et al, 2004; Mickiewitcz et al, 2004). There are other studies that see liquidity constraints rather dependent on the development stage of the company and dependent on the industry (Valdemarra, Kaufmann, 2004). A typical example is with the fast-growing hi-tech companies that face strong liquidity constraints in the phase of product development. In the current data-sample, there are not so many companies for analyzing the industry dependency of liquidity constraints, nor does the structure of the collected data allow for analyzing different development stages of companies.

3.1.3. Pricing objectives and pricing methods

The third research task of the current dissertation was to analyse the pricing objectives and pricing methods used in Estonian companies. Within the theoretical part of pricing behaviour and pricing management six essential findings were presented, which have a high significance based on previous empirical studies, but have contradictory or unclear connections to each other. These findings were used in the 3rd empirical study, presented in the second part of the current thesis, to analyse pricing behaviour of companies, and results are presented and discussed in the current subchapter. The summary of essential findings is presented in Table 3.8.

Table 3.8. Essential findings about pricing of companies

Pricing objectives and pricing methods of Estonian companies
Efa: The overall objective of pricing is the maximation of profit
Efb: The cost-plus pricing method is overwhelmingly most used pricing method within companies
Efc: Most of companies use several pricing techniques simultaneously
Efd: The usage of the cost-plus pricing method is not similar in different industries
Efe: The interest rate has direct influence to the pricing
Eff: The influence of exchange rate to prices is industry-dependent

Source: compiled by the author

According to several studies distinguishing pricing objectives and pricing methods, there are objectives related to profit maximation (Meidan, 1996; Carson et al, 1998) and multiple objectives (Avlonitis, Indounas, 2005; Diaz, 2006) including profit maximation. As it turns out, the implementation of multiple objectives is rather mixed and contradictory (Grant et al, 2001, pp. 68–69; Urbany, 2001a). The results of the empirical study show that the wide range of objectives are much better organised than has been expected. All companies within the study pointed out the strong orientation to profit maximation in the long run, where in the short-run they would face some obstacles. This is in line with the findings of other studies of the pricing objective (see e.g. Diamontopolus, 1991; Avlonitis, Indounas, 2005). The wide spectrum of short-term considerations within the pricing behaviour would indicate the rather complex dilemmas of companies in what they face in their price settings and use of multiple pricing methods. Also, the assumption that the pricing method that companies are using is indicating their objectives (Grant et al, 2001, pp. 67–68; Guilding et al, 2005, pp. 125–127) is not valid when the proper distinguishing between the short-term tasks and long-term objectives is made.

The use and influence of the cost-plus method is more sophisticated than as presented in several empirical studies using the questionnaires of companies (Carson et al, 1998; Avlonitis, Indounas, 2005; Guilding et al, 2005) or company-based panel data (Diaz, 2006). For better explaining empirical findings from Ef2 to Ef6, the following framework should be presented. According to the case-study analysis brought in the study, many companies use two-level price management, where some part of the pricing decisions are made often (based on fluctuating raw material prices, etc.) – the quick pricing – and based dominantly on the cost-plus method, whereas other parts of pricing decisions are made more rarely – the long pricing – and are not mainly based on the cost-plus method. Therefore, even if these companies report that they use dominantly the cost-plus method, they are still concerned about competition, customer satisfaction, etc., considerations through the long pricing procedures. Taking into consideration that the study was done within SMEs, there can be multiple-level pricing in bigger companies, whereas the decisions are made at different levels of the management. This multiple level pricing would explain the contradictory results of empirical studies, stating on the one hand the dominant

usage of the cost-plus method, and the customer orientation and profit maximation objectives on the other hand. The influence of the cost would initiate pricing procedures, rather than influencing the pricing itself.

This two-level (multiple level) pricing procedure is in line with the findings, were SMEs tend to use strong activity-based costing (Lere, 2000) or other similar cost-management approaches (Brierly et al, 2001). This would explain the obvious implementation of cost-plus pricing methods in the quick-pricing, and complications of implementation of the cost-plus methods in the long-pricing. This multiple-level pricing gives an explanation for the cost-plus methods' usage sensitivity on different industries, where several empirical studies report this effect (Diamantopulus, 1991; Brierly et al, 2001; Lere, 2000; Guilding et al, 2005). According to the multiple-level pricing, companies with the high exposure of direct costs implement more often the cost-plus pricing method then companies with the low importance of direct costs. This finding is in line with studies for arguing the industry sensitivity to the usage of the cost-plus pricing method (Diamantopulus, 1991; Brierly et al, 2001; Lere, 2000; Guilding et al, 2005). The multiple-level pricing practice would explain also empirical findings of Ef5 and Ef6, where the interest rates would rather influence the long-pricing, and the exchange rate would rather influence through the raw-material prices the short-pricing. Therefore, the sensitivity of usage of the cost-plus method is not determined by the absolute or relative importance of costs (s.c. traditional cost structure), but rather is determined by the structure of the costs within the line of the quick-pricing and the long-pricing consideration.

Finally, another possible explanation of the high usage of the cost-plus method should be mentioned. According to the several empirical studies (Carson et al, 1998; Avlonitis, Indounas, 2005; Diaz, 2006), there are several pricing methods used simultaneously in the price management of companies. As the cross-case analysis of the study shows, the high usage of the pricing method would not ultimately indicate the high implementation. As several occasions have shown, the increase of price of inputs would initiate the procedure of pricing based on the cost increase consideration, but would not ultimately lead to higher prices. Also, the cost-pricing consideration and framework was used during the price negotiations as the argument of higher prices, which is in line with other studies (Urbany, 2001a; Herrmann et al, 2007). Therefore, in questionnaires testing the importance of cost-plus pricing, the usage and the implementation of the methods should be clearly distinguished.

3.2. Conclusions of interest rate influences and implications to the monetary transmission mechanisms

In the previous chapter the validity of propositions was analysed, as well as a wider discussion of empirical findings was presented. This chapter analyses interest rate influence on the behaviour of economic subjects and discusses their possible influence on the monetary transmission mechanisms. Whereas most

empirical studies of the monetary transmission mechanisms are made using macro-level data, not distinguishing companies and households, the behaviour analysis of economic subjects and their sensitivity to interest rates could create the possibility to analyse monetary transmission mechanisms separately through the micro level data.

Interest rate influence on the behaviour of private persons

Interest rate influence on the behaviour of private persons has been studied in the 1st empirical study of the current dissertation. According to the Forward Looking Theories of Consumption, financial indebtedness is influenced by interest rates and wages. The empirical study results show that only 2.8% of those who have taken credit (and 4.0% of respondents who have not taken credit) consider interest rates as determinants of indebtedness. Also, a favourable interest rate was considered the main determinant by only 5.8% of respondents. The interest rate was not considered important in the borrowing decision making process for the future – 33.9 % of total sample group considered the need for goods/services as an important future borrowing determinant, 30.7 % mentioned the wage level and 9.2 % considered favourable interest rates. Therefore, the interest rate as the external determinant of a borrowing decision is relatively weak, and is outperformed by other external macro determinants (expected increase of income, price level and favourable economic climate). Also, study results show that higher interest rates do not stimulate changes in consuming habits or in savings behaviour, even though the variety of different people within the total sample group should be considered. The poor performance of low interest sensitivity to financial behaviour cannot be explained by poor knowledge or insufficient education, but rather by the attitudes of borrowing and irrational expectations of intertemporal consumption.

Based on those results, the traditional Keynesian interest rate channel on monetary transmission mechanisms should have a rather insignificant influence on the household borrowing decisions. Testing the efficiency of the interest rate channel in transition countries using macro-level data with high and volatile inflation is rather complicated. Still, there are studies arguing the importance of conventional interest rate channels in monetary transmission mechanisms in Estonia (Sepp et al, 2004). The statement is based on the modelling of interest rate reactions to an external disturbance, where the model itself has not been revealed, which makes the assessment of findings rather difficult. Other, similar, studies have used Bank of Estonia's macroeconomic models (Basdevant, Kaasik, 2002; Pikkani, 2001), where the Kalman filter has been used to determine variables using the time period of 1993 till the beginning of 2000. Whereas the variables used in those macroeconomic models would not allow for specifying determinants of the interest rate channel differently from other channels of monetary transmission mechanisms, the results of the interest rate channel dominance will remain unrevealed. Rather, similar studies of the interest rate influence on the real economy have been done at the beginning of the 2000's (Lättemäe, 2001), where the behaviour models were derived and

estimated by using OLS regressions on error correction model specifications. The demand for credit is modelled by the IS-LM model where the interest rate sensitivity to private persons' borrowing and company investments are *ad hoc* assumed. The result of the model indicates the interest rate sensitivity to the real economy (Pikkani, 2001), whereas the channel of the monetary transmission mechanism is not specified. A similar approach to the interest rate influence has been used in other studies of CEE countries (Coricelli et al, 2006b), where the sporadic significance of the interest rate channel has been found in Estonia, testing 1995–2000 macroeconomic data.

The main difference between the new-Keynesian interest rate channel on monetary transmission mechanisms and the traditional Keynesian interest rate channel is the fact that economic agents would rather use their expectations for economic behaviour, instead of *ex ante* facts of economic determinants (Attila, Ozun, 2007). According to the new-Keynesian interest rate channel of monetary transmission mechanisms, the expectation of the interest rate determines the influence of monetary transmission and has an impact on private persons' borrowing/saving behaviour. The most used approach, besides the rational expectations to the interest rate expectation, is the adaptive learning process (Evans, Honkapohja, 2006; Chen, Kulthanavit, 2008b), where the interest rate is determined by the historical interest rates. Whereas the real interest rate in Estonia has been rather stable, despite the fluctuations of inflation (Sepp et al, 2004, pp. 40–42), the expectations of the interest rate could be modelled by an adaptive learning process. This in turn would allow for interpreting the results of interest rate influence on the behaviour of private persons as the expected interest rate influence on the behaviour of private persons, and would allow for stating the insignificancy of expected interest rates on the behaviour of private persons.

The interest rates could have an influence on the households' behaviour, where the higher interest rates would reduce disposable income and, therefore, leave less money for consumption. Even though the interest rate consideration was not significant and can be explained by the relative low indebtedness of the total sample group (76.9% of respondents with financial obligations stated their loans up to 500,000 eek), the valuation of indebtedness was often done through the monthly lump sum down payment – 47.0 % of respondents who have taken the credit referred to the lump sum payment. Due to the indebtedness evaluation of private persons the effect of the exchange rate channel of the monetary transmission mechanism to private persons should also be significant, where higher interest rates decrease prices of imported goods and, through this, the demand for domestic products is reduced. The relatively high price sensitivity of Estonian consumers should affect the foreign exchange channel bypass ratio, to be high and directly dependent on the exchange rate influence on the pricing by companies. Few empirical studies confirm that, in case of import, the pass-through is statistically significant for commodity-types of goods, such as petroleum, non-mineral products and basic metals (Dabusinskas, 2003)

The credit channel impact on the behaviour of private persons is also discussed in the current dissertation. Within the empirical study there has been asked the borrowing constraints for additional amounts of money for the private person, where most of the respondents considered borrowing constraints unimportant. There are several macro-level studies (Pikkani, 2001; Lättemäe, 2001; Sepp et al, 2004) where the importance of the credit channel of the monetary transmission mechanism has been discovered, whereas the influence of household borrowing has not been distinguished from company borrowing. It should also be mentioned that those studies do not distinguish possible effects of the risk-taking channel of the monetary transmission mechanism from the credit channel impact, where both of these channels have a rather similar influence and context of appearance.

The wealth effect channel of the monetary transmission mechanism, which is also not directly tested in the current dissertation, should have a rather mild influence, whereas the savings of Estonian private persons are relatively low (Coricelli et al, 2006a) and the influence of wealth is lower then in other CEE countries (Paabut, Kattai, 2007). There are few empirical studies of CEE countries stating the relative unimportance of the wealth effect in these countries (Coricelli et al, 2006b). The explanations are in line with indirect findings of the current dissertation, where the low level of savings would reduce the impact of the wealth channel of monetary transmission mechanisms in CEE countries. Besides the direct wealth channel of the monetary transmission mechanism, the indirect effect of the wealth channel should also be discussed. The mechanism of the indirect wealth channel works through the interest rate impact on the assets of private persons, which would indirectly influence the borrowing (Mishkin, 2007). The main asset used in models of the indirect wealth channel is the housing property. The lower interest rates would induce a higher mortgage value which, through the higher collateral value, could allow higher borrowing by households. Due to the growing financial engineering and innovations, the indirect wealth channel of the monetary transmission mechanism had affected strongly the recent credit boom in many countries. Whereas the indirect wealth effect is strongly related with the housing prices, the empirical studies often refer to the housing prices (Catte et al, 2004; Egert, Mihalje, 2008; Sellin, Walentin, 2008).

The risk-taking channel of private persons has been analysed in the results of questionnaire, where determinants are based on what respondents consider their borrowing. 6.4% of respondents stated that the favourable economic climate is the most important when considering their borrowing (5.8% of respondents stated the favourable interest rates and 12.7% increase in income/salary). The importance of a favourable economic climate is seen increasing as a determinant of borrowing decisions when respondents considered their future borrowing, where 16.1% of respondents considered it as a main determinant. It should be also mentioned that 78.6% of respondents did not plan to borrow in the near future (the Study was made at the end of 2008), a period which was a rather unclear economic environment for most people in Estonia.

The summary of the findings are shown in Table 3.9, where each monetary transmission channel has been accompanied with information about the analysing method used in the current dissertation, as well as brief results of the efficiency of those channels. Table 3.9 includes only information about the private persons' financial behaviour and, therefore, is not directly implemented as the efficiency of full channel of monetary transmission mechanism.

Table 3.9. Monetary transmission mechanism channels determined by different aspects of behaviour of households

Monetary transmission mechanisms and channels	**Analysed or discussed within the study**	**Testing results or proposition based on the study**
Direct monetary transmission	Analysed	Significant
Traditional Keynesian interest rate channel	Partially tested	Insignificant
Exchange rate channel	Discussed	Significant
Credit channel	Partially tested	Insignificant
Wealth effect channel	Discussed	Insignificant
Risk-taking channel	Partially tested	Rather significant

Source: compiled by the author

Finally, some conclusions of risk-group behaviour analysis should be made. According to the current study the risk group behaviour was determined, based on interest ignorance behaviour, where interest rates, as an important exogenous variable, do not have an impact on household financial behaviour. Even though the interest rate sensitivity cannot be considered ad hoc as the determinant of risk-group behaviour (Tuusis, 2010), the interest rate sensitivity is a relatively good proxy for possible default behaviour of private persons. According to the results of the empirical study, only 17% of respondents were clearly interest sensitive persons, whereas most of the respondents showed ignorance towards the exogenous variables of financial behaviour. On one hand, the low interest rate sensitivity may be explained by the relatively low indebtedness (Coricelli et al, 2006a) of the average Estonian person, where the active usage of different subprime financial products may dominate. On the other hand, the determinants of borrowing, accompanied with the rigidity of consumption habits as well as overall financial innovation, could indicate the irrational behaviour attitude towards the intertemporal consumption, and could lead to the serious

aggregated problems to model future financial behaviour and credit growth of private persons.

Interest rate influence on the behaviour of non-financial companies

According to the neoclassical interest-profit theory of investment, investment decisions are strongly determined by interest rates which, through the influence of cost of capital, have an impact on the required return of investments. A higher required return of investment would, in turn, reduce the demand for investments, which is the basic framework of the traditional Keynesian interest rate channel of the monetary transmission mechanism. This interest rate channel effect was tested in the 2nd empirical study through the direct questionnaire of 200 of the biggest Estonian companies, where 44 companies responded. The aim of the empirical study was to discover the determinants of investment decisions of Estonian companies and analyze motives behind them. The study sample covered big non-financial companies where the respondents were top managers of the companies. Conclusions have been divided into three groups for better coverage of the topics.

First, the factors of investment decisions were found and ranked in line of importance. The study shows that respondents do not consider, for investment management, the cost of capital factors. According to the study, Estonian companies consider risk and uncertainty issues as the main issues in taking new investment decisions, followed by factors of liquidity and business confidence factors. Only the fourth subgroup, ranked at the lower importance to companies in investment decisions, included the cost of capital issues. The low importance of the cost of capital framework on investment decisions is supported by other empirical studies (Wilkes et al, 1996; Tevlin, Whealan, 2003; Schaller, 2006).

Second, out of those results a deeper analysis of interest rate influence on investment decisions was made. According to the neoclassical interest-profit theory of investment, the investment decisions are strongly determined by interest rates through the cost of capital, whereas the other channels of monetary transmission mechanisms provide a different framework to the interest rate influence on investments (Bernake, Blinder, 1988; Mishkin, 1996; Detken, 2004). As the empirical analysis shows, companies consider the interest rate's influence to be through the direct interest costs and its influence on profit, rather than on its influence on the cost of capital and through that to shareholder value. At the overall level, interest rates are not considered as an important factor in the management of companies. Therefore, it would become natural that the analysis of investment decisions cannot be strongly determined by interest rates and cost of capital. Based on the study results, the traditional Keynesian interest rate channel can be excluded from the monetary transmission mechanisms of companies in Estonia. Even though the overall influence of interest rates is rather mild, the monetary transmission mechanism could work through the direct channel of the monetary transmission mechanism, where higher interest rates would reduce EBIT of companies and, therefore, leave less cash for investments.

Third, the empirical study contained the analysis of financial constraints of companies. Whereas the liquidity constraints were mentioned as a determinant of investments, the importance of liquidity constraints to the management of companies was also analysed in more detail. In the liquidity constraint analysis the strong influence of liquidity to the investment management of companies was found based on a strong preference to use internal equity to finance investments. More than 65% of respondents ranked internal equity as their first choice of investment finance. Therefore, the strong liquidity constraint existence within investment management of Estonian companies could be considered. Those broad findings are in line with other studies of transmission channels of monetary policy in Estonia (Lättemäe, 2001; Sepp et al, 2004; Juks, 2004), as well as in other transmission economies (Amato, Gerlach, 2001; Ramanauskas, 2006; Detken, 2004; Cenic, 2008). Even though a different testing approach has been used on those different macro-level studies as determinants of inflationary process (Lättemäe, 2001; Sepp et al, 2004; Ramanauskas, 2006), credit growth analysis (Detken, 2004; Cenic, 2008), sustainable consumption and economic growth (Amato, Gerlach, 2001), etc., they overwhelmingly state the domination of the credit channel of the monetary transmission mechanism. The credit cannel influence is stated to be significant also in recent financial downturns in several countries (Doyle, 2009).

The strong domination of the direct monetary transmission would cause higher expectations for a strong exchange rate channel. By the cost-plus pricing implementation, if the profit maximation objective holds and interest rate would increase, companies should increase prices. This framework of profit maximation consideration is in line with several empirical studies, stating the strong domination of cost-plus pricing methods among companies (Morris, Fueller, 1989; Carson et al., 1998; Paleologo, 2004; Avlonitis, Indounas, 2005; Guilding et al, 2005), where the cost-plus pricing method is even linked to the profit maximation motive of companies (Guilding et al, 2005, pp. 125–127). The pricing behaviour of companies was studied in the 3rd empirical study, where incentives of companies using the cost-plus pricing method were analysed. The results of the study indicate the rather strong discrimination of costs used in implementation of the cost-plus pricing methods in companies. Due to the multiple-level price management and complications of indirect cost considerations in pricing, indirect costs are not considered in pricing in the same way as direct costs. Costs of raw materials, and other direct costs, would have a much stronger impact on the pricing than other types of costs, including financial costs. All companies did not respond on their pricing decisions in their cost-calculations to changes of financial costs and other indirect costs, even though those costs had a substantial share in the overall cost structure. The finding is in line with several empirical studies, explaining the different usage of cost-plus pricing methods in different industries (Guilding et al, 2005, pp. 130–133; Diaz, 2006, pp. 214–216), cost discrimination in usage of pricing (Ness, Walker, 1995; Lere, 2000; Brierly et al, 2001) and usage of other pricing methods despite the domination of cost-plus pricing (Carsson et al, 1998; Avlonitis,

Indounas, 2005, pp. 52; Herrmann et al, 2007). Based on those study results, it could be stated that despite the similar management attitude between the balance sheet channel and the exchange rate channel of the monetary transmission mechanism, the efficiency of the balance sheet channel is much milder than the efficiency of the exchange rate channel. There is a strong impact of raw-material types of costs to prices; other types of costs have no influence on prices, even in highly competitive industry sectors. The usage of the cost-plus method is strongly dependent on the industry structure in a country where more value-added industries in the economy would obviously decrease the efficiency of the exchange rate channel. Therefore, with the further development of the economy, the influence of the exchange rate channel is naturally diminishing in Estonia (Sepp et al, 2004), as well as in other transition countries (Amato, Gerlach, 2001; Coricelli et al, 2006b). The exchange rate has a strong impact on pricing of companies where the added-value to the imported product is rather slim; as long as value-adding is increasing and the cost structure changes, the impact of the exchange rate influence diminishes, diminishing the efficiency of the exchange rate channel of the monetary transmission mechanism.

The Q channel and the new-Keynesian interest rate channel have not been directly analysed within the current dissertation. Still, there are some important considerations that could direct the assumptions for further analysis of those channels. First, the efficiency of the Q channel is directly linked with the efficiency of the stock market, where companies are utilising the positive Q through the active investment and expansion to increase shareholder wealth (Gilchrist, Zakrajsek, 2007; Comin, Philippon, 2005). Based on the framework of active cost of capital management, the Q channel and the Keynesian interest rate channel work similarly, requiring the same management focus of companies. Whereas the 3rd empirical study indicated the weak cost of capital incentives within the biggest companies of Estonia, the natural assumption would also be a rather weak efficiency of the Q channel of the monetary transmission mechanisms in Estonia. The same low importance of other contemporary monetary transmission mechanisms could be assumed, such as the y-channel, which actively utilises the cost of capital incentive of companies (Philippon, 2007). Second, the efficiency of the new-Keynesian interest rate channel could be assumed rather similarly to the efficiency of the traditional Keynesian interest rate channel. According to the new-Keynesian interest rate channel, the expectation of interest rate determines the influence of monetary transmission and has an impact on the companies' investment incentives through the influence of the cost of capital. On the one hand, the interest rate expectation can be modelled through the adaptive learning process (Evans, Honkapohja, 2006; Chen, Kulthanavit, 2008b) where the interest rate is determined by the historical interest rates, which would allow interpreting the results of the interest rate influence similar to the expected interest rate influence. Whereas the real interest rate in Estonia has been rather stable, despite the fluctuations of inflation (Sepp et al, 2004), the difference between the expectations of interest rate and real interest rates would be rather

insignificant and could not influence the behaviour of companies. On the other hand, the new-Keynesian interest rate channel utilises similar cost of capital incentives of companies, which turns out to be rather insignificant in the management of Estonian companies.

As previously mentioned, empirical macroeconomic studies have underestimated the risk-taking channel. The empirical analysis, where the determinants of companies' investment decisions were analysed, indicates the relative importance of business confidence as the management framework of investment management. It should be noted that the business confidence is strongly procyclical with the economy, where the efficiency of the risk-taking channel also changing in time (Borio, Zhu, 2008). Therefore, the influence of risk-taking channel effects during the different stages of the economy has an impact on behaviour of economic subjects and should be more considered in empirical macroeconomic studies. Whereas the credit channel has also a rather procyclical behaviour, as does the risk-taking channel, the obvious explanations of the economic phenomena should be carefully considered (Lättemäe, 2001), and political reactions carefully planned.

The summary of the findings are shown in Table 3.10, where each monetary transmission channel is accompanied with information about the analytic approach used, as well as a short result of the efficiency of those channels. Table 3.10 includes information only about the companies' financial behaviour and, therefore, is not directly implemented as the efficiency of the entire channel of the monetary transmission mechanism.

Table 3.10. Monetary channels determined by different aspects of behaviour of companies

Monetary transmission mechanisms and channels	**Tested or discussed within the study**	**Testing results or proposition based on the study**
Direct monetary transmission	Analysed	Rather insignificant
Traditional Keynesian interest rate channel	Partially tested	Insignificant
Exchange rate channel	Analysed	Significant
Tobin q channel	Discussed	Insignificant
Balance sheet effect (through the net wealth influence) of credit channel	Analysed	Significant
Risk-taking channel	Analysed	Rather significant

Source: compiled by the author

3.3. Limitation of the study and suggestions for future research

In this section important limitations for dissertation results will be presented, as well as the author's view for the most intriguing topics for future research. Even though some limitations have been mentioned already within previous chapters and subchapters, the three most important limitations are currently presented. Additionally, the limitations recommendations for future studies are given. Some of the recommendations for future studies are directly related to the limitations of the studies, as well as the necessity to repeat tests to cover different time periods. Some recommendations could be derived directly from the contradictory findings of different studies, where the usage of different methodologies or different study approaches could solve those contradictions. Despite the limitation of implementing findings the study results should be analysed and considered also in the future researches

The first limitation of the current dissertation, and also recommendation for future studies, relies on the fluctuating efficiency of monetary policy transmission channels, which is based on the changed behaviour motives of economic subjects. There are several empirical studies using the same methodology and similar dataset to test the same model in different time periods, and still end up with different results. There have been mentioned several reasons for this, including the changing socio-economic context (Pereira, 1991; Campbell, 2006), financial innovation (Love, 2001; Campbell, 2006), relaxing regulations (Miles, 1992; Bayomi, 1993), increased income and social security (Modiglini, 1985; Mishkin, 1995), development of financial intermediation (Ehrmann et al, 2003; Philippon, 2007), etc. Therefore, the results of empirical studies on the behaviour of economic subjects are strongly limited on the time context. Findings mentioned above are valid for a certain period of time, and validity should be tested at some level when there are important structural changes in a country. Even though behaviour motivations of economic subjects should not change in a short time, there might be still changes due to the very dynamic economic and social environment. As most of the transition economies face these radical changes (De Bondt, 2002; Sõrg, Tuusis, 2005), the validity of empirical findings are limited in time. Change in behaviour of economic subjects during the time period makes it very challenging to study intertemporal processes, and influences the validity of the results, even if the results are statistically significant. Therefore, the combination of studies presented in the empirical part of the current dissertation should be critically considered, prior to making any further conclusions. The 1st study analysed the determinants and financial behaviour of private persons at the end of 2008; the study of investment behaviour of companies was carried out in 2001; the pricing behaviour of companies covers the years 2005–2007. Even though the period from 2001 till 2007 (2008) was a remarkable growth period in the Estonian economy, and a period of big economic and political changes, still, the period could be considered as relatively stable. The influence of the 1997–1998 global crises had

disappeared; monetary and banking reforms had been carried through; institutional changes, especially in the banking sector had ended and the overheated economic influence had not yet had its impact. Taking into consideration that the behaviour of companies and private persons are rather inert and stable, the period itself is rather smooth, without any fluctuations or major structural changes.

The second limitation of the current dissertation is related with the possible biased sample group from the target population. Several empirical studies analysing the characteristics of a certain product group (Gary-Bobo, Larribeau, 2003; Sulaiti et al, 2006), or certain group of people (Stone, Maury, 2006) or companies (Diaz, 2006), use them as the proxy for the larger sample group, or the whole population. The same problem was tackled in the current dissertation, even though the compositions of sample groups are carefully designed and studied. Still, the comparison of different empirical studies as well as combining results of different studies become very challenging, and should therefore be carefully studied. The 1st empirical study used a sample group which has rather good representative characteristics of the average Estonian person, whereas the behaviour of the average Estonian might not be a good proxy to model the Estonian private persons' credit growth. On one hand, the average Estonian does not fit into the average borrower, representing the behaviour of the average financial instrument, and through that, explaining credit growth and borrowing activity of Estonia. On other hand, the average Estonian approach could have a good representation for risk-group analysis, and also shows a better explanation for possible future development of financial behaviour and credit growth and explains better the financial behaviour motives and attitudes of all society. The 2nd study analyses investment management decisions based on a sample of 44 biggest non-financial companies, which obviously does not present the behaviour of an average Estonian company. Here it should be mentioned that the behaviour of big companies is biased towards more rational behaviour (Kadapakkam et al, 1998; Paleologo, 2004; Diaz, 2006). Therefore, study results would also be biased towards a more rational solution, which would, in the case of the current dissertation, make conclusions even more valid – the dependency of the cost of capital framework on investment management of the average Estonian company is expectedly weaker than the dependency of the sample group companies, and liquidity constraint influence stronger. The 3rd study analyses the pricing behaviour of Estonian companies exclusively through SMEs, where even the niche domination is excluded. This sample group obviously does not match the average Estonian company, and therefore the study results are biased towards the more competitive business environment than the Estonian business environment. Therefore, it should also be noted that the sample of the study, which is appropriate for analysing contradictions of use of the cost-plus pricing method, might not be as good for analysing pricing behaviour of the average Estonian company. Should be also mentioned that all these studies were carried through the direct empirical methods as questionnaires and semi-structured interviews where respondents were asked to evaluate

and describe their attitudes and behaviour. Even though the study was deliberately designed to investigate motives and reasoning of financial behaviour of economic subjects, the possible influence to the conclusions should be recalled.

The third limitation is related with the conclusions of the dissertation and implementation of results to the efficiency of different channels of the monetary transmission mechanisms. The efficiency of the monetary transmission mechanism is not *a priori* related with the behaviour of an average private person or company. The determinants in empirical studies have been found as the arithmetic average for the total sample group. Therefore, there could be determinants which dominate strongly in a few sub-groups, and have therefore much stronger influence than the best ranking average determinant. It should also be noted that the average Estonian private person is not the best proxy for credit growth, the average Estonian company is not the best proxy for overall investment or pricing behaviour. Still, the average approach represents the best way for the motives and incentives behind the decisions and behaviour (Chirinko, 2004). Also, it should be noted that the analysis of efficiency of the monetary transmission mechanisms is rather focused on the balance of different channels, rather than on the efficiency of each separate channel. Therefore, the ranking of the most efficient channel is not in focus as much as the different set of efficient channels, as well as possible divergence of the efficiency of different channels (Mishkin, 2007).

The main focus of the current dissertation was to analyse the behaviour of economic agents, discuss in detail motives behind those different types of behaviour, and analyse possible implications of those behaviour aspects for the monetary transmission mechanisms. Further studies in line of efficiency of the monetary transmission mechanism channels could be directly derived from Tables 3.9 and 3.10, where several channels are not analysed at all, or analysed indirectly within the current dissertation. Here should be outlined two of those directions of further studies, focusing on the monetary transmission channels. The first is related with the housing price influence on the borrowing behaviour. According to the recent literature, there is a high attention to the wealth effect channel of the monetary transmission mechanism, through the impact of housing prices (Bernake, Gertler, 2000; Catte et al, 2004; Havrylchyk, 2004; Weinberg, 2006), which is often referred to as the indirect wealth channel of households (Mishkin, 2007). Recent big gains and losses in housing prices have influenced several economies all over the world through the influence of the behaviour of the different participants and economic subjects. Even though Estonia does not have an active monetary policy (Randveer, 2009, pp. 10), there should be considered the Euro-area monetary policy influence to the indirect wealth channel for any appropriate set of policy instruments, which could be applicable in similar cases within or outside the Euro-area. The second intriguing channel of the monetary transmission mechanism is the risk-taking channel, where the influence of the business confidence and consumer confidence is considered. These channels have received rather little attention of micro-level studies, as well as in macro-level studies. Even though there is a not

well analysed test model, as well as the influence of the channel is rather similar with different credit channels of the monetary transmission mechanism, the author of current dissertation assumes the efficiency of the channel to be rather significant. Business confidence and consumer confidence themselves are quite controversial subjects, therefore, studies in that field would also have an interest for practical purposes. Finally, it should be stated on the rather poor coverage of the efficiency analysis of different monetary policy transmission channels in Estonia. Whereas several transition economies in CEE countries might face rather similar socio-economic circumstances, the wider academic cooperation could fill the gap in studies on that field, as well as encourage academic discussion on issues of the monetary transmission mechanism.

Besides the focus of the efficiency of the monetary transmission mechanism channels analysing the behaviour of economic subjects, at least two other important focuses should be mentioned. The first is the focus of the high value-added intensive knowledge-based companies. Based on several studies of economic growth (Fernandez et al, 2002; Campbell, 2006), it becomes obvious for the necessary structural change of the Estonian economy, in respect to industries were the high value-added intensive knowledge-based companies should dominate over traditional companies. Therefore, the focus of further studies could be transformed from the monetary transmission mechanisms of the entire economy, to the determinants of certain sectors of companies, or study determinants of companies at different development stages (Love, 2001). Based on results of those studies, proper economic and fiscal policies could be developed to encourage business development, investment and product implementation throughout the whole life-cycle[19] of those specific industries.

The second research focus, which could be rather intriguing and challenging, is on the financial behaviour of private persons. Even though the weak influence of interest rate to borrowing decisions controversies many theoretical studies in that field (Jeanfils, 2000; Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006; Fritzer, Reiss, 2007), it should be stressed that those studies have been conducted mainly based on certain financial products such as credit cards, mortgage loans, etc. The methodology of those studies focuses on the statistical validity of the explaining variables, instead of the causal relation between variables. Here it should be mentioned that studies using a similar methodology have similar findings. As the study result presented in the current dissertation shows, the most dominant determinant of the borrowing decision is the consumption determinant, where 52% of respondents noted it as the main determinant of the borrowing decision. Liquidity constraint was not an important determinant, at least for the total sample group of the people, where still, most of the people did not plan to borrow in the near future (it should be mentioned that the questioning took place in Sept-Nov 2008). Therefore, an intriguing question remains, in what has limited the borrowing activity of people. The

[19] according to several opinions, Estonian companies are very slow to implement business findings, which would cause strong emigration of valuable business ideas

author's hypothesis is that there could be a strong influence of the overall economic confidence of people but, for a final conclusion, this should be properly tested. It might be that the confidence of the private persons is much more important than the liquidity constraint which has been used to explain the diminishing borrowing activity of private persons. Another intriguing finding of borrowing behaviour is the rather weak sensitivity of the interest as the proxy of the readiness to correct behaviour, based on the outside influence. According to the study results, most of the people are not willing to change their financial behaviour on a change in interest, whereas the major determinant for borrowing remains consumption. Even though the risk group issues are analyzed within the current dissertation, there are still plenty of reasons for more studies on that field. It should be remembered that indebtedness *per capita* of the Estonian people, as well as the average indebtedness *per capita* in CEE countries, is relatively low, and further credit behaviour of private persons has a strong influence on the whole economy. There should also be much more academic discussion of socially balanced rights and obligations of participants in financial markets in Estonia, concerning the growing concerns of indebtedness of several persons and households. Those studies have received much higher priority in developed countries than in developing countries, were the problems themselves seem to be more acute in developing countries.

APPENDICES

Appendix 1. Questionnaire for the survey of Estonian private persons' indebtedness and financial behaviour (Study I)

1. Üldandmed

vanus
sugu
rahvus

elukutse: õppur/tudeng
ettevõtja
töötaja
töötu
pensionär

elukoht: Tallinn, lähiümbrus
mujal Eestis

ülalpeetavaid: ei ole
on (lapsed, teised ülalpeetavad)

omate eluasemelaenu: ei jah

omate muid laenusid: ei jah
(s.h. liising, järelmaks, võlad tuttavatele jms)

omate muid finantsvarasid: ei jah
(säästud, aktsiad, vabatahtlikud pensionifondi osakud)

Omate krediitkaarti: ei jah

2. Laenukoormuse hindamine

2.1. Kui suured on Teie laenud kokku:
(sealhulgas järelmaksud, liisingud, võlad tuttavatele jms)

pole laenusid
alla 100 000.- krooni
100 000 – 500 000 krooni
500 000 – 1milj krooni
1–3 milj krooni
üle 3 milj krooni

2.2. Pangast
pole laenusid
alla 100 000.- krooni
100 000 – 500 000 krooni
500 000 – 1milj krooni
1–3 milj krooni
üle 3 milj krooni

2.2. Kuidas hindate oma laenukoormust:
väike
normaalne
liiga suur
ei oska oma laenukoormust hinnata

2.3. Mille järgi hindate oma laenukoormust:
% palgast/sissetulekutest
laenu kestvuse/pikkuse järgi
intressi% järgi
igakuise laenumakse järgi
muu parameetri järgi

2.4. Kui suur võiks olla Teie normaalne laenukoormus: ……..

2.5. Kui suur osa sissetulekust kulub Teil praegu oma laenude maksmiseks:
……..

2.6. Kas teate, kui suur on Teie laenude (keskmine) intress: ……..

3. Laenuotsuse tegemine

3.1. Kas plaanite lähiajal võtta uut laenu:

ei		eluase
jah	Kui jah siis mis otstarbel:	auto
		reisimine
		õppimine
		tarbimine
		lastega seonduv
		muu

3.2. Mis mõjutab/mõjutas kõige enam Teie laenuotsust:

(kui on mitmeid põhjuseid nummerdage vastused tähtsuse jäjekorras)

soodne kauba/teenuse hind
pakiline vajadus kauba/teenuse järgi
palga/sissetulekute kasv
soodne majanduskeskkond
soodsad intressimäärad
reklaam
muu

3.3. Olles teinud laenuotsuse, mis põhjusel lükkasite/lükkaksite oma otsuse edasi:

ebasoodne kauba/teenuse hind
puudub vajadus kauba/teenuse järgi
palga kasv
ebakindel majanduskeskkond
kõrged intressimäärad
muu

3.4. Millised peaksid olema tingimused, et kaaluksite uue laenu võtmist:

soodsam kauba/teenuse hind
pakiline vajadus kauba/teenuse järgi
palga/sissetulekute kasv
positiivsem majanduskeskkond
madalamad intressimäärad
muu

3.5. Mis otstarbel võtaksite uut laenu:

eluase
auto
reisimine
õppimine
tarbimine (TV,pesumasin,niiduk jms)
lastega seonduv
muu

4. Muu laenukäitumine

4.1. Kas olete jäänud laenu tagasimaksega ka mõnikord hiljaks:
mitte kunagi
väga harva
vahetevahel
üsna tihti

4.2. Laenu vajadusel pöördun eelkõige järgneva isiku poole:
pank
sõbrad-sugulased
muud (laenu)ettevõtted

4.3. Kui on võimalik soetada asju liisinguga (järelmaksuga), siis:
kasutan meelsasti
kaalun hoolikalt tingimusi
üldiselt väldin

4.4. Kuidas nõustute alltoodud väidetega enda kohta:

	nõustun (1)	ei nõustu (5)
Eriti ei pööra tähelepanu kui palju ja kuna ma kulutan		
Ma olen üldiselt kokkuhoidlik		
Minu jaoks on oluline säästa ka rasketeks aegadeks		
Rahaasjade korraldamise (s.h. laenu võtmisel) tunnen ennast kindlalt		
Ma koostan oma sissetulekute ja väljaminekute kohta eelarvet		
Sageli on mul palgapäevaks rahad juba kulutatud		
Ma olen üsnagi impulsiivne kulutaja		
Ma ei saa aru, kuhu mu raha kaob		

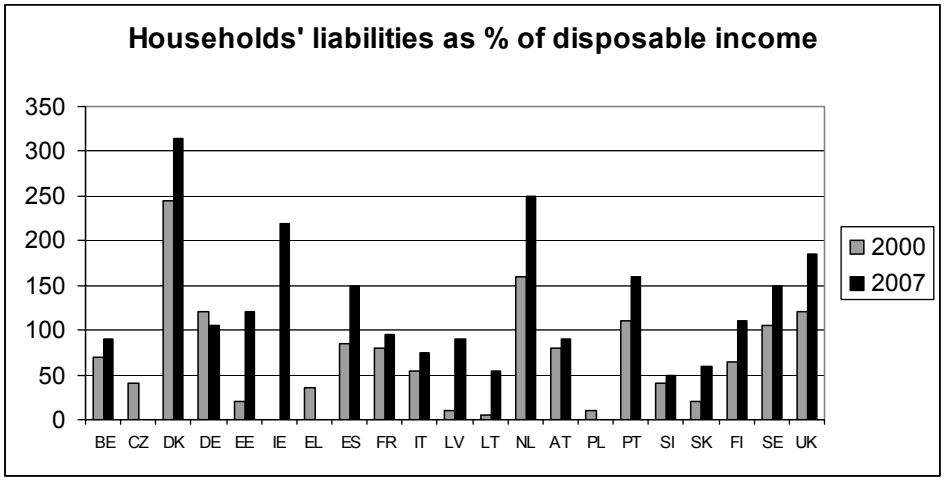
5. Intresside mõju laenudele; muu laenukäitumine

5.1. Kuidas nõustute alltoodud väidetega enda kohta:

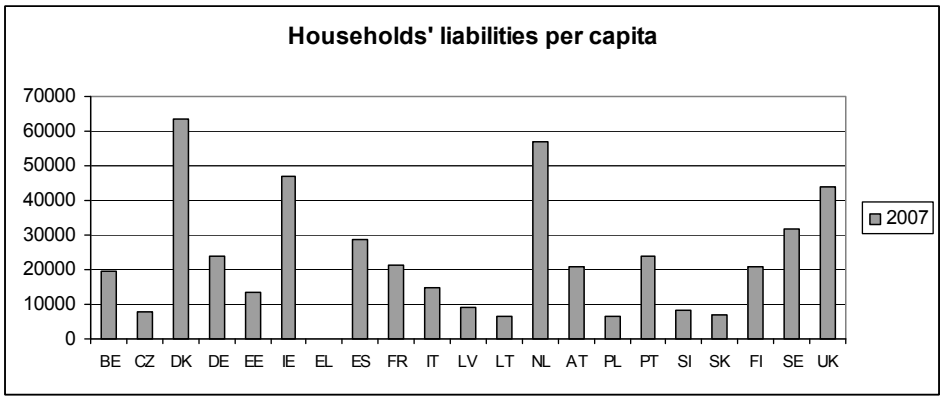
	nõustun (1)	ei nõustu (5)
Järelmaksuga (liisinguga) ostes kaalun eelkõige vajadust eseme järgi		
Paarsada krooni täiendavat laenumakset kuus ei ole minu jaoks probleem		
Tean täpselt oma laenude intressimäärasid		
Olen muutnud hiljuti oma tarbimisotsuseid kuna intressid on tõusnud		
Minu krediitkaart on sageli miinuses		
Kui ostan midagi suuremat (TV, arvuti jms) kasutan meeleldi järelmaksu		
Kui intressid suurenevad 1% võrra, siis jätan mõne vajaliku asja ostmata		
Intressid on viimase kahe aasta jooksul oluliselt kasvanud		
Tean, mis tähendab EURIBOR		
Olen jätnud hiljuti mõned vajalikud ostud tegemata		
Eesti majandusel seisavad ees rasked ajad		
Mind töökoha kaotus ei ähvarda		

Mul oleks üsna kerge vajadusel saada laenu (10 000.- krooni)
Kaalun lähiajal elamispinna ostu
Kui laenumaksed jäävad alla 20% palgast pole laenudega probleemi
Üldiselt mulle ei meeldi väga pikaajalised laenud (üle 10 aasta)
Mul on pangast võetud laenusid
Olen võtnud kiirlaenusid (sealhulgas SMS-laenusid)

Appendix 2. Households' indebtedness in Estonia and other countries of EU



Source: Leetmaa et al, 2009; Zarco, 2009



Source: Leetmaa et al, 2009; Zarco, 2009

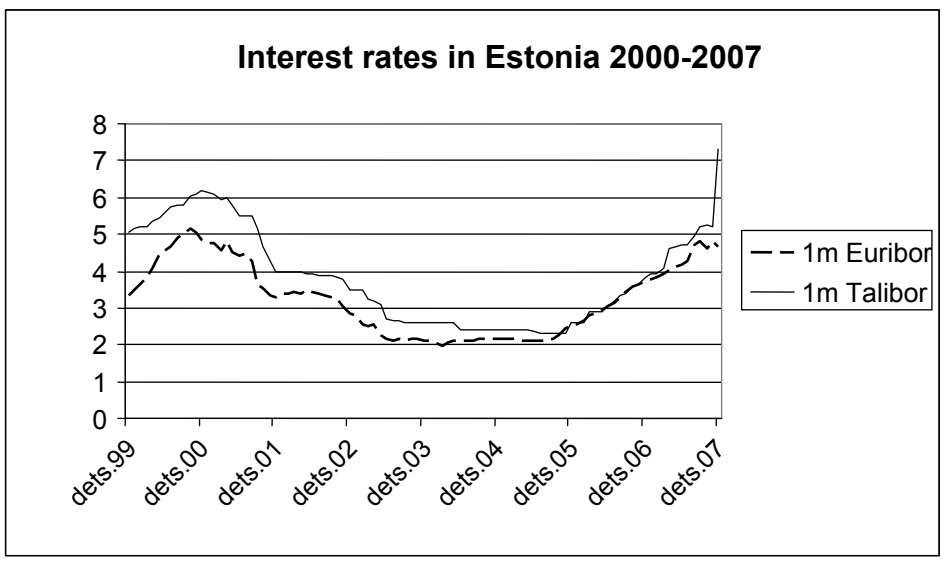
Appendix 3. The concentration of Estonian banking sector

(given by amount of total assets, in milj EEK)

	2000		2007	
Eesti Krediidipank	832,1	1,5%	4 557,6	1,6%
Eesti Ühispank / SEB	15 456,1	28,0%	72 567,2	25,5%
Hansapank / Swedbank	33 758,3	61,2%	166 692,1	58,5%
Sampo Pank	4 401,1	8,0%	36 413,0	12,8%
Preatoni Pank / SBM	152,5	0,3%	599,7	0,2%
Tallinna Äripank	539,0	1,0%	1 497,6	0,5%
BIG / BIG Pank			2 533,6	0,9%
	55 139,4	**100%**	**284 860,8**	**100%**

Source: Eesti Pank 1

Appendix 4. The comparision of 1-month Euribor and 1-month Talibor interest rates

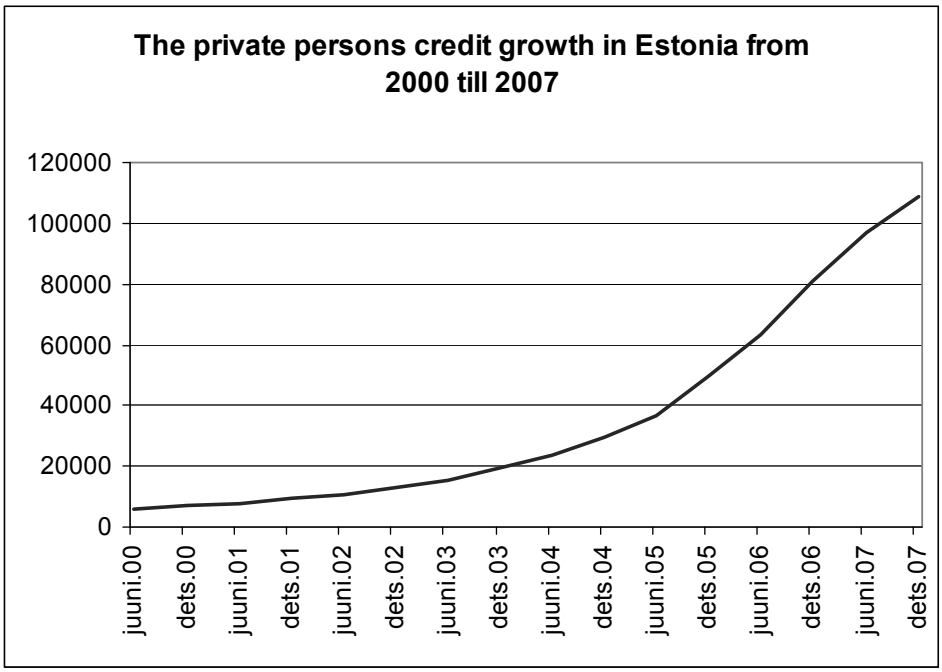


Source: Eesti Pank 2; BOF (Central Bank of Finland)

Appendix 5. The list of companies responding to the questionnaire used in the 2nd empirical study

Eesti Energia AS
TALLINNA SADAM, AS
Eesti Telekom, AS
Eesti Telefon, AS
EESTI PÕLEVKIVI, AS
Tartu Veevärk, AS
Eesti Post, AS
Radiolinja Eesti AS
Trans-Kullo, AS
Imavere Saeveski, AS
SHELL EESTI AS
Reval Hotelligrupi AS
Tartu Õlletehas, AS
Nurmelin, OÜ
LUKOIL EESTI AS
Tartu Keskkatlamaja, AS
Lennuliiklusteeninduse AS
Eesti Metallieksport, AS
ROCCA al MARE KAUBANDUSKESKUSE AS
Elcoteq Tallinn, AS
Narva Elektrivõrk, AS
MERKO EHITUS, AS
Tallegg, AS
Eesti Meedia AS
N-Terminal Grupp, AS
OBER-HAUS, AS
Cueks, AS
Eesti Ringhäälingu Saatekeskuse AS
HTM SPORT EESTI, OÜ
WEROL TEHASED, AS
Kalev, AS
E.L.L. Kinnisvara AS
Paulig Baltic, AS
Fanaal, AS
Harju KEK, AS
FAMAR-DESI, AS
Veho Eesti AS
EE GRUPP, AS
VIRU KEEMIA GRUPP AS
PÄRNU VESI, AS
Saarte Liinid, AS
PALJASSAARE KALATÖÖSTUS, AS
Austria Tabak Eesti AS
Mecro, AS

Appendix 6. The Private persons' credit growth in Estonia from 2000 till 2007 (in milj EEK)



Source: Eesti Pank 3

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SUMMARY IN ESTONIAN – KOKKUVÕTE

Uurimusi intressimäärade mõjust majandussubjektide käitumisele

Töö aktuaalsus

Intressimäärade mõju majandussubjektide käitumisele tõusis majandusteadlaste ja praktikute huviorbiiti XX sajandi alguses (Homer, Sylla, 1996). Esimesed terviklikud mudelkäsitlused intressimäärade mõjust majandussubjektide käitumisele töötati välja 1930-ndatel aastatel; samas põhjalikumad ja fundamentaalsemad majandussubjektide ajaliste eelistuste valikud ja käitumisteooriad 1950-ndatel aastatel. Need käsitlused, mille kohaselt nominaalsed intressimäärad mõjutades reaalseid intressimäärasid mõjutavad ettevõtte investeeringuid ja eraisikute tarbimisotsuseid, on Keynesi IS-LM mudeli aluseks ning on kasutuses ka tänapäevastes majandusmudelites (vt. Basdevant, Kaasik, 2002; Sepp et al, 2004).

Käesolevas doktoritöös on majandussubjektid jagatud kahte suuremasse gruppi – ettevõtted ja eraisikud. Muid majandussubjektide tasemeid uurimustes eristatud pole, mis pikemaajaliste majandusprotsesside uurimise puhul on õigustatud ja igati otstarbekas. Kui ettevõtete käitumist muutuvate intressimäärade olukorras on uuritud väga põhjalikult ning käsitletud nii arvukates uuringutes kui ka finantsjuhtimise õpikutes, on eraisikute finantskäitumise ja intressimäärade mõju uurimine olnud oluliselt tagasihoidlikum (Campbell, 2006). Vaatamata majandussubjektide ajaliste eelistuste ja käitumismudelite erinevatele variatsioonidele ning edasiarendustele, on valdav veendumus intressimäärade mõju kohta majandussubjektide käitumisele sarnane – ettevõtete investeerimisotsuse tingib investeerimisprojekti suurem tootlikkus võrreldes ettevõtte kaalutud keskmise kapitali hinnaga; eraisiku tarbimisotsuse või selle edasilükkamise tingib tänase tarbimise heaolu võrdlus oodatava tarbimisheaoluga tulevikus. Nii ettevõtte keskmine kapitali hind kui ka suhteline erinevate perioodide oodatav heaolu on suuresti määratav reaalsete intressimääradega, mis omakorda on mõjutatud nominaalsetest intressimääradest. Ülaltoodud majandussubjektide finantskäitumise paradigma on aluseks nn. traditsioonilistele finantskäitumisteooriatele nii ettevõtete kui ka eraisikute puhul[20].

Hilisemad empiirilisd uuringud on peale intressimäärade mõju toonud esile ka muid tegureid, mida ettevõtted ja eraisikud oma pikemaajaliste majandusotsuste tegemisel arvesse võtavad. Ettevõtete käitumise puhul on eelkõige välja toodud likviidsusküsimused (Fazzari et al, 1988; Hall, 1995; Gilchrist, Himmel-

[20] Põhjalikum käsitlus ettevõtete puhul on leitav Modigliani et al, 1958; Hall, Jorgenson, 1967; Gilshrist, 1999; eraisikute käitumise modelleerimise põhjalik analüüs Modigliani, 1985; Deaton, 1992, pp. 76–101

berg, 1998), aga ka majanduskeskkonna ebastabiilsusega seotud probleemistik (Guiso, Parigi, 1999; Temple et al, 2000; Bloom, 2009), ettevõtete majandususaldus (Wilkes et al, 1996) ja muud tegured. Eraisikute käitumise uurimisel on pigem rõhutatud majanduskeskkonna keerukust ja eraisikute varade spetsiifikat, mis muudab ratsionaalsete käitumismudelite koostamise keeruliseks ning komplitseerib nende testimist (Mishkin, 2007; Campbell, 2006; Weinberg, 2006). Arvestades eeltoodut ning asjaolu, et rõhuv enamus majandussubjektide käitumist ja intressimäärade mõju käitumisele puudutavatest uurimustest on tehtud makrotaseme andmeid kasutades, on käesolevas dissertatsioonis käsitletud intressimäärade mõju majandussubjektidele mikroandmete baasil. Samuti on käesolevas doktoritöös valdavalt kasutatud otsest majandussubjektide käitumismotiivide uurimise lähenemist, kus erinevate metoodikatega analüüsitakse majandussubjektide käitumist, käitumismotiive ja käitumisharjumusi ning nende mõjutajaid. Nimetatud lähenemise suurimaks probleemiks on kirjeldatavuse probleem (Campbell, 2006), mistõttu uurimistulemuste representatiivsus (ingl. *representativeness*) vajab hoolikat selgitamist. Samas on otseste käitumismotiivide uurimise lähenemine vaba nii uurimustulemuste erinevatest võimalikest interpreteerimisvõimalustest kui ka testmudeli kitsendavast raamistikust (Livingstone, Lunt, 1992).

Intressimäärade mõju majandussubjektide käitumisele läbi ajaliste käitumiseeliste (ingl. *intertemporal utility preferences*) mõjutamise mängib olulist rolli rahapoliitika mõjukanalite (ingl. *monetary transmission mechanisms*) määratlemisel. Traditsiooniline intressimäärade mõju majandussubjektide käitumisele defineeritakse kui intressimäära kanalit (ingl. *interest rate channel*) ning mis on kõige enam mainitud rahapoliitika mõjukanal erialases kirjanduses. 1980-ndatel aastatel rahapoliitika mõjukanalite põhjalikumal uurimisel ilmnesid teiste kanalite mõjud intressimäärade kanali kõrval (Bernake, Blinder, 1988; Mishkin, 1996). Samuti kinnitasid otsesed ettevõtete ja eraisikute käitumist analüüsivad uuringud muude mõjurite olemasolu nii ettevõtete investeerimisotsuste tegemisel (Bernake, Blinder, 1988; Wilkes et al, 1996; Gilchrist, Himmelberg, 1998) kui ka eraisikute laenu- ja tarbimisotsuste kujunemisel (Livingstone, Lunt, 1992). Seega rahapoliitika kujundamisel ja elluviimisel on määrav tähtsus erinevate mõjukanalite olulisuse ning rahapoliitika mõju hindamisel nii ettevõtete kui ka eraisikute käitumisele. Tabelis 1 on toodud erinevate rahapoliitiliste mõjukanalite toimimise kirjeldus ettevõtete investeerimisotsustele ja eraisikute tarbimisele ning laenamisele.

Tabel 1. Erinevate rahapoliitika mõjukanalite toime nii ettevõtete kui eraisikute finantskäitumisele

Rahapoliitika mõjukanalid	**Ettevõtted**	**Eraisikud**
Otsene rahapoliitika mõjukanal	*Kõrgemad intressmäärad vähendavad ettevõtte **ärikasumit** ja seetõttu vähendavad otseselt ettevõtte rahalist võimekust* (Uurimus 2 ja Uurimus 3)	*Kõrgemad intressimäärad vähendavad eraisikute **vabalt kasutatavat sissetulekut,** jättes vähem raha tarbimiseks* (Uurimus 1)
Traditsiooniline intressimäärade kanal	*Kõrgemad intressimäärad suurendavad ettevõtte **kapitali hinda** ja seeläbi vähendavad investeeringuid* (Uurimus 2)	*Kõrgemad intressimäärad muudavad **laenukulu** ja säästmistulu ning seeläbi vähendavad eraisikute tarbimist* (Uurimus 1)
Vahetuskursside kanal	*Kõrgemad intressimäärad vähendavad imporditud tootmissisendite hindasid (ja kasvatavad eksporttoodete hindasid), mõjutades läbi **hindade** ja kasumi ettevõtete investeeringuid* (Uurimus 3)	*Kõrgemad intressimäärad vähendavad importtoodete **hindasid** ja seeläbi vähendavad nõudlust kodumaise toodangu järele* (Uurimus 1)
Tobin'i q kanal	*Kõrgemad intressimäärad vähendavad **noteeritud aktsiate hindasid** ja Tobin'i Q suhet mis omakorda vähendab investeeringuid* (Uurimus 2)	
Varamõjude kanal		*Kõrgemad intressimäärad vähendavad üldjuhul eraisikute vara ja **säästude väärtust** ning seeläbi vähendavad ka tarbimist* (Uurimus 1)
Krediidikanal (mõju läbi majandussubjekti netovaralisuse)	*Kõrgemad intressimäärad vähendavad ettevõtte netovara (tagatisvara) ning seeläbi vähendavad ettevõtte **laenuvõimet*** (Uurimus 2)	*Kõrgemad intressimäärad vähendavad eraisikute netovara (tagatisvara) ja vähendavad eraisikute **laenuvõimet*** (Uurimus 1)
Majandususalduse kanal	*Kõrgemad intressimäärad osundavad üldjuhul majandusolukorrale, kus **ettevõtete usaldus** (ingl. business confidence) väheneb ning seetõttu ka ettevõtete investeeringud vähenevad* (Uurimus 2)	*Kõrgemad intressimäärad osundavad vähenevale **tarbijate usaldusele** (ingl. consumer confidence) ja seetõttu väheneb ka eraisikute tarbimine* (Uurimus 1)

Allikas: kasutatud erinevate autorite töid (Mishkin, 1996; Amato, Gerlach, 2001; Ireland, 2005; Mishkin, 2007; Cenic, 2008; Borio, Zhu, 2008); täiendatud autori poolt

Käesolevas doktoritöös on tabelis toodud mõjusid uuritud järgmiselt: *Bold*-kirjaviisis märgitud mõjusid on uuritud otseselt, allajoonitud mõjusid on uuritud kaudselt. Iga rahapoliitika mõjukanali kirjelduse juures on toodud ka käesoleva dissertatsiooni empiiriline uuring, milles nimetatud probleemistikku käsitletakse. Tabelis 2 viidatud uurimuste numeratsioon vastab dissertatsiooni empiirilises osas toodud tööde järjekorranumbrile.

Käesoleva doktoritöö rahapoliitika mõjukanalite uurimise aktuaalsuse juures Euroopa Rahaliidu rahapoliitika mõju kontekstis tuleb ära mainida veel kahte olulist asjaolu, mida käesolevas doktoritöös käsitletakse. Esimene asjaolu on seotud hiljutiste dünaamiliste majandusprotsesside uurimise ja mõistmisega. 2000-ndate aastate algusest on oluliselt kasvanud nii Eesti kui ka teiste Euroopa riikide laenukohustused (Duenwald et al, 2005; Sõrg, Tuusis, 2005; Coricelli et al, 2006b; Tuusis, 2007), millega koos on kiiresti kasvanud sissetulekud, vähenenud intressimäärad ja laienenud finantsteenuste spekter. Kiire laenude ja võlgnevuste kasv on täheldatav mitte ainult majanduslikult arenevates ja ülemineküriikides, vaid ka majanduslikult arenenud riikides (vt. Mishkin, 2007; Mohanty, Turner, 2008; Doyle, 2009) ja seda oluliselt enam, kui majanduslikult põhjendatud laenamine. Seega majandussubjektide otsese käitumise uurimine annab parema võimaluse mõistmaks nii ettevõtete kui ka eraisikute käitumise motiive ning seeläbi adekvaatsemalt modelleerida nende käitumist.

Teine käesoleva uurimustöö oluline aktuaalsuse asjaolu tuleneb otseselt eraisikute ülikiirest võlakoormuse kasvust ja seisneb riskigrupi inimeste käitumise analüüsimises ja hindamises. Kuigi üldtunnustatud riskigrupi definitsiooni puudub, on üldise arusaamise kohaselt tegemist inimestega, kellel on tekkinud või võib tekkida laenude tagasimaksega probleeme. Erinevate uuringute kohaselt võib hinnata riskigrupi suuruseks 10% kuni 30% riigi elanikkonnast (Kempson, Whiley, 1999; Kalafatelis et al, 2004). Riskigrupi probleemistik on kujunemas riikidele tõsiseks sotsiaalseks väljakutseks mõjutades oluliselt ka riigi üldist makromajanduslikku stabiilsust. Käesolevas uurimustöös on käsitletud intressimäärade mõju kaudu eraisikute käitumisele ka riskigruppide temaatikat ning tulemused on toodud kokkuvõtvas osas.

Uurimuse eesmärk ja ülesanded

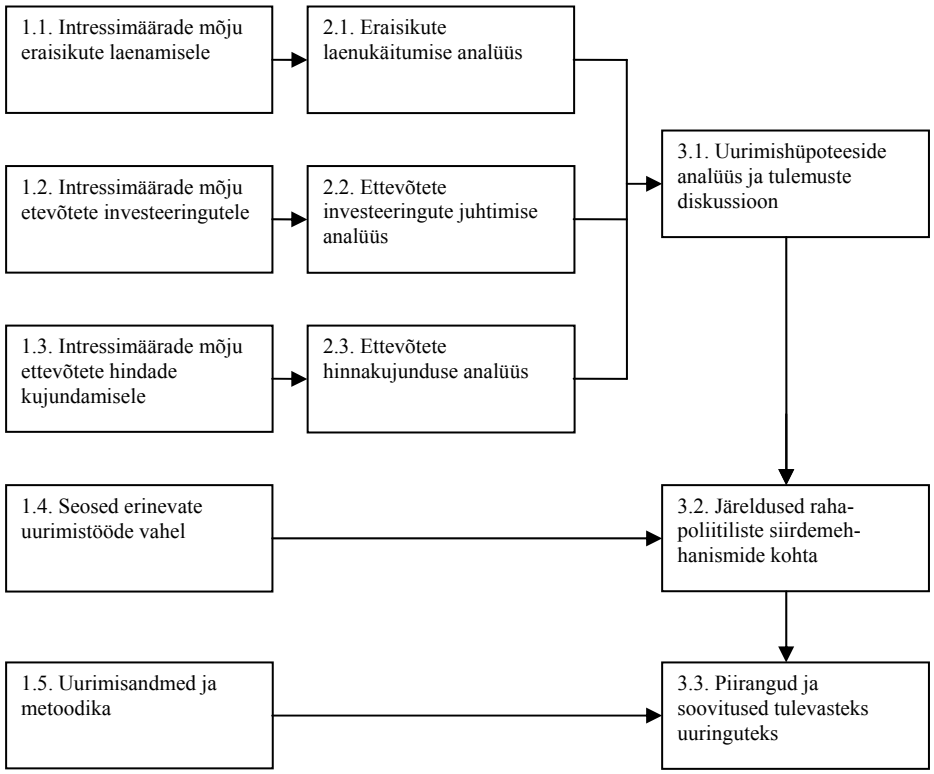
Käesoleva uurimustöö üldiseks ülesandeks on uurida intressimäärade mõju majandussubjektide käitumisele ja selle kaudu hinnata erinevate rahapoliitika mõjukanalite võimalikku efektiivsust. Majandussubjektide kõikvõimalikest käitumissituatsioonidest hinnatakse käesolevas töös ainult neid käitumissituatsioone, mis on eelnevate uuringute põhjal enim mõjutatavad intressimäärade muutustest ning omavad mõju majandusele rahapoliitika mõjukanalite mõttes. Oluline on siinjuures ära märkida, et vaatamata töö teoreetilises osas toodud majandusmudelite põhjalikule ülevaatele ja uurimushüpoteeside püstitamisele, on töö empiiriline osa oma põhiolemuselt vaba käitumismudelite eeldustest ja käsitleb majandussubjektide käitumist võimalikult eeldustevabalt.

Selline lähenemine võimaldab kirjeldada majandussubjektide käitumist mõnevõrra laiemalt kui intressimäärade mõjusid hinnates ning seda on tehtud nii eraldiseisvates uurimustes kui ka uurimusi koondavas käesolevas doktoritöös. Samuti on töös kasutatud hulgaliselt viiteid teistele uuringutele, mis on valdavalt läbi viidud teiste riikide andmete põhjal ning vaatamata vaid uuringutes kasutatud Eesti empiirikale on käesoleva töö autori arvates uuringutulemused rakendatavad teistele majanduspiirkondadele. Kuna doktoritöö käsitleb erinevate majandussubjektide erinevaid käitumissituatsioone, siis üldine uurimusülesanne oli igati otstarbekas jagada kolmeks enam fokuseeritud uurimisülesandeks, mis on toodud järgnevalt.

Esimene uurimisülesanne on analüüsida eraisikute laenamist ja leida laenamist mõjutavad muutujad otseselt eraisikute laenamisotsuseid uurides (Uuring 1). Läbi eraisikute otsese küsitluse saab vahetumalt uurida eraisikute laenukäitumist ning selline lähenemine toob paremini esile laenamise motiive ja laenamist põhjustavaid otsuseid. Teine uurimisülesanne on leida Eesti ettevõtete investeerimisotsuseid mõjutavad muutujad (Uuring 2). Kuna intressimäärade mõju investeerimisotsuste tegemisele võib avalduda erinevalt, siis intressimäärade mõju on uuritud ka sedavõrd sügavamalt. Kolmas uurimisülesanne on seotud ettevõtete hinnakujundusega ja erinevate muutujatega hinnakujundusel (Uuring 3). Ettevõtete hinnakujunduse keskne teema on kulupõhine hinnakujundus (ingl. *cost-plus pricing*) mille rakendamist on põhjalikult käsitletud.

Doktoritöö struktuur ja teoreetiline taust

Käesolev doktoritöö koosneb kolmest osast: teoreetiline osa, empiirilised uurimused ja kokkuvõttev osa. Töö ülesehitus on toodud Joonisel 1.



Allikas: autori koostatud
Joonis 1. Doktoritöö struktuur

Töö teoreetiline osa on jagatud viieks peatükiks, millest kolm esimest käsitlevad vahetult kolme uurimisülesannet. Ülejäänud peatükid seovad erinevad uurimisülesanded üheks tervikprobleemiks (peatükk 1.4.) ja kirjeldavad detailselt uurimisandmeid ja -metoodikat (peatükk 1.5.). Peatükid on omakorda jagatud alapeatükkideks, et anda parem ülevaade käsitletavast ainestikust. Iga vahetult uurimisülesandega seotud peatükk lõpeb alapeatükiga, kus peatükis eelnevalt toodud mudelite ja empiiriliste tööde põhjal püstitatakse uurimisülesande töö-hüpoteesid või markeeritakse olulisemad seisukohad antud uurimisvaldkonnas. Tööhüpoteese on analüüsitud töö teises osas olevates empiirilistes uurimustes ning tööhüpoteeside tulemusi käsitletud töö viimases kokkuvõtvas osas.

Intressimäärade mõju kirjeldamist eraisikute laenamisotsustele on käesolevas töös alustatud 1950-ndatel aastatel välja töötatud traditsioonilistest majandusmudelitest, milles on hõlmatud nii püsiva tulu hüpotees (ingl. *permanent income hypothesis*) kui ka inimese eluiga kirjeldav finantsmudel (ingl. *life-cycle hypothesis*). Nende mudelite kohaselt on eraisiku tarbimise muutus ΔC (ning sealt tulenevalt ka vajadus laenu järgi) mõjutatud tuleviku

sissetulekute ootuste muutusest $(E_t - E_{t-1})Y_{t+k}$ ja ajaliste eelistuste diskontomäärast r ning on kirjeldatav järgneva seosena.

$$\Delta C_t = C_t - C_{t-1} = \frac{r}{1+r}\sum_{k=0}^{\infty}(1+r)^{-k}(E_t - E_{t-1})Y_{t+k}$$

Toodud seos on aktiivsemalt kasutatavaid seoseid eraisikute laenukäitumise hindamisel ja riikide üldise võlakasvu kirjeldamisel (vt. Jeanfils, 2000; Calza et al, 2003; Brzoza-Brzezina, 2005; Backe et al, 2006; Fritzer, Reiss, 2007).

Teises alapeatükis on käsitletud eelkõige traditsiooniliste laenumudelite edasiarendusi ja variatsioone. Esimene edasiarendus puudutab eraisikute eluiga kirjeldavat finantsudelit ning säästude ja muude finantsvarade mõju eraisikute tarbimisele. Kuna eraisikute säästud Eestis on suhteliselt ebaolulised nii suhtena SKP-sse kui ka võrreldes teiste majanduslikult arenenud riikide säästudega, on säästude ja muude finantsvarade mõju tarbimisele väheoluline (Paabut, Kattai, 2007). Teine oluline edasiarendus puudutab eraisiku tarbimisotsuseid laenupiirangu (ingl. *credit constraint*) tingimustes, kus eraisiku laenamist on piiratud absoluutselt (eraisik saab laenata kuni konkreetse summani ja mitte rohkem) või suhteliselt (eraisik saab laenata kuni konkreetse summani soodsalt ja edasine laenamine toimub juba oluliselt kallimalt). Laenupiirangu seadmine ei mõjuta üheselt eraisikute laenukäitumist, laenupiirangu seadmine ei pruugi automaatselt tähendada eraisiku tarbimiskäitumise muutust. Eraisikute laenukäitumine on pigem tingitud erinevatest eraisiku käitumuslikest ja tarbimislikest parameetritest. Vaid käitumuslike ja tarbimislike parameetrite lähendamine võimaldab hinnata konkreetselt laenupiirangute mõju eraisikute käitumisele.

Kolmandas alapeatükis on käsitletud teisi mudeleid ja meetodeid eraisikute laenukäitumise uurimisel. Esimesena on vaadeldud käitumismudeleid, mis põhinevad mittereaalsetel tarbija eeldustel ja ootustel (ingl. *models of financial mismanagement*). Nende mudelitega testitakse eraisikute käitumismustreid, kus testmudelite aluseks on eraisiku ebaratsionaalne käitumine ja ebareaalsed ootused (vt. Ausubel, 1991; Calem, Mester, 1995; Gross, Souleles, 2001; Sulaiti, 2006). Teise finantskäitumise mudelite grupina vaadeldakse metoodikaid, mis otseselt ei tugine ühelegi konkreetsele eraisiku finantskäitumise mudelile vaid jälgib otseselt eraisikute (finants)käitumist ning teeb järeldusi vaadeldu põhjal (vt. Livingstone, Lunt, 1992; Collard, Kempson, 2003, Stone, 2006; Sanchez-Munos et al, 2008). Nimetud lähenemine on oluliselt laiendanud muutujate hulka, mis võib mõjutada eraisikute finantskäitumist ja laenuotsuseid alates demograafilistest ja psühholoogilistest faktoritest lõpetades situatsioonipõhiste käitumisfaktoritega. Peatüki neljas alapeatükk sisaldab nimetatud kolme alapeatüki põhjal toodud nelja tööhüpoteesi mida testitakse empiirilises osas toodud uurimuses.

Intressimäärade mõju ettevõtete investeerimisotsustele on käsitletud kolmes alapeatükis, millest viimane sisaldab uurimishüpoteese. Esimene alapeatükk hõlmab klassikalist ettevõtte investeerimisteooriat, mis töötati välja 1950-ndate

aastate lõpus ning mille kohaselt investeerib ettevõtte seni, kuni investeeringu oodatav tulunorm on kõrgem ettevõtte kaalutud keskmisest kapitalihinnast (Modigliani, Miller, 1958). Ettevõtte investeering, mis on vaadeldav ettevõttes kasutatava vara hulga (füüsilise kapitali hulga) muutusena, sõltub ettevõtte kasutatava kapitali intensiivsusest p_tQ_t/K_t ja kapitali hinnast c^K ning on kirjeldatav järgmise seosena.

$$\Delta \ln K_t = \eta + \lambda \left[\ln\left(\frac{p_t Q_t}{K_t} \right) - \left(\frac{1}{1-\sigma} \right) \ln c_t^K \right]$$

Parameetrid λ ja σ määravad ära vastavalt investeeringu toimumise suhtelise kiiruse ja investeeringute elastsuse kapitalikulude suhtes. Valemist ilmneb, et madalam intressimäär (ja seetõttu ka madalam kapitalikulu) põhjustab ettevõtte suurema investeeringu ja vastupidi. Seose logaritmiline esitlus võimaldab seost otseselt kasutada empiirilistes uuringutes (vt. Bernake, Blinder, 1988; Oliner et al, 1995; Guiso et al, 2002; Tevlin, Whealan, 2003; Schaller, 2006; Gilshrist et al, 2008). Erinevad empiirilised uurimused kasutavad nii kapitali intensiivsuse kui ka selle erinevate komponentide lähendamisel erinevaid ettevõtete näitajaid, samuti on erinevaid lähenemisi kasutatud ettevõtte kapitalihinna lähendamisel.

Teine alapeatükk kirjeldab likviidsuspiirangute mõju ettevõtete investeerimisotsustele. Eeldades ettevõtte kasumi maksimeerimise soovi ja asümmeetrilise informatsiooni olemasolu ettevõtte ja finantsinstitutsiooni vahel, saab näidata ettevõtte soovi teostada investeeringuid omavahenditest. Seda soovi on erinevates empiirilistes uuringutes püütud ka näidata, uurides seoseid investeeringute ja ettevõtte likviidsuse vahel (vt. Blanchard et al, 1994; Opler et al., 1999; Love, 2001), investeeringute ja pangakrediitide vahel (vt. Nielsen, 1999; Kohler et al, 2000; Riddiough, Wu, 2009) ja investeeringute ja dividendimaksete vahel (vt. Kaplan et al, 1997; Fama, French, 2002; Hardin, Hill, 2008; Riddiough, Wu, 2009). Uuringud kinnitavad valdavalt likviidsuspiirangute mõju ettevõtetele, kuid on ka mitmeid kriitilisi seisukohti nii metoodilisele lähenemisele kui ka saadud tulemustele (vt. Elston, 1999; Ghosh, Sirmans, 2006). Samuti on leitud, et üldine finantssüsteemi areng vähendab likviidsuspiirangute mõju investeeringutele (vt. Oks, 2001; Ehrmann et al, 2003). Peatüki kolmas alapeatükk sisaldab kahe alapeatüki põhjal toodud kolme tööhüpoteesi, mida on uuritud epiirilises osas toodud uurimuses.

Intressimäärade mõju ettevõtete hinnakujundusele ja üldiseid hinnakujunduse mehhanisme on käsitletud kolmandas peatükis, mis on omakorda jagatud kolmeks alapeatükiks. Esimene alapeatükk käsitleb ettevõtete hinnakujunduse eesmärke ja nende seotust hinnakujundusmehhanismidega. Mitmed varajasemad empiirilised uuringud toovad välja kululisa meetodi (ingl. *cost-plus method*) kui prevaleeriva hinnakujundusmeetodi ettevõtete hinnakujunduses (Morris, Fueller, 1989; Carson et al., 1998; Paleologo, 2004; Avlonitis, Indounas, 2005; Guilding et al, 2005), samas kui hinnakujunduse eesmärkide osas prevaleerib eesmärkide paljusus (Avlonitis, Indounas, 2005, pp. 53–54; Diaz,

2006, pp. 214–216). Paljude eesmärkide osas mainitakse kõige rohkem kasumi maksimeerimist (Carson et al, 1998; Urbany, 2001; Hunt, 2002; Lere 2000; Avlonitis, Indounas, 2005), kuid samuti ka müügitulu maksimeerimist, turuosa, tootmisvõimsuste optimeerimist, kliendibaasi/kliendisuhte hoidmist, õiglase ja õigustatud hinna pakkumist, potensiaalsete konkurentide mõjutamist jms. Valdavalt on selles peatükis käsitletud uuringud seotud väikeste ja keskmise suurusega ettevõtete (SME-de) hinnakäitumisega.

Teises alapeatükis on põhjalikumalt käsitletud kululisa hinnameetodit ja selle rakendamist ettevõttes. Paljud empiirilised uuringud pole täpsustanud kululisa hinnameetodit ning seetõttu selle hinnameetodi interpreteerimine on olnud pigem intuitiivne. Vähestes uuringutes on kululisa hinnameetodit täpsemalt tutvustatud (vt. Avlonitis, Indounas, 2005, pp. 52; Lucas, 2003; Pasura, Ryals, 2005, pp. 47; Guilding et al, 2005, pp. 125–127) – täiendavad lisandunud kulud lisatakse hinnale. Samas on mitmeid uuringuid, kus väidetakse SME-des laialt levinud kulude jälgimise praktikat, mis on sarnane tegevuspõhisele kulujälgimisele (ingl. *activity-based costing*) (vt. Ness, Walker, 1995; Chenhall, Langfield-Smith, 1998; Lere, 2000; Brierly et al, 2001). Samuti näitavad empiirilised uuringud kululisa hinnameetodi sõltuvust tööstusharust (Diamantopulus, 1991; Guilding et al, 2005, pp. 130–133). Varajasemate uuringute väidete baasil on koostatud nii hinnakujunduse eesmärkide kui ka hinnakujundusmeetodite kasutamise kohta ettevõtetes kuus olulist seisukohta peatüki kolmandas alapeatükis, mille alusel on koostatud doktoritöö empiirilise osa vastav uurimus.

Esimese osa neljas peatükk seob kokku kolme eelneva peatüki teemad ning töö teises empiirilises osas toodud kolm iseseisvat uurimust. Intressimäärade mõju nii ettevõtete kui ka eraisikute käitumisele väljendab monetaarpoliitika erinevaid mõjukanaleid ning annab ülevaate intressimäärade võimalikest mõjudest majandussubjektide käitumisele. Selles peatükis käsitletakse nii kulude mõju inflatsioonile kui ka valuutakursside kaudu toimivat rahapoliitika mõjukanalit (ingl. *exchange rate channel of monetary transmission mechanism*). Nii kulupõhine inflatsioon kui ka valuutakursside mõju hindadele on seotud ettevõtete hinnakujunduse eesmärkide, meetodite kui ka nende rakendavusega seotud probleemistikuga. Oluline koht on klassikaliste intressimäärade kaudu toimival rahapoliitika mõjukanalil (ingl. *interest rate channel of monetary transmission mechanism*), mis on nii klassikalise IS-LM mudeli kui ka eraisikute ajaliste eelistuste võrdlemise aluseks. Intressimäärade kanali üheks testimise meetodiks peetakse intressimäärade läbilaskvust (ingl. *interest rate pass-through*), mille järgi aktiivse intressipoliitika muutuste kajastumine lõpptarbijale (eraisikutele ja ettevõtetele) näitab intressikanali efektiivsust. Vaatamata asjaolule, et intressimäärade kanali efektiivsust on makroandmetega keeruline testida, on ka intressimäärade läbilaskvuse meetodil mitmeid puudusi, mida käesolevas doktoritöös on markeeritud. Peale nende kanalite on käsitletud monetaarpoliitika mõju läbi krediidikanali (ingl. *credit channel of monetary transmission mechanism*), mis on otseselt seotud ettevõtete ja eraisikute krediidiressursi kättesaadavusega, monetaarpoliitika mõju läbi varade hindade

(ingl. *asset price channel of monetary transmission mechanism*) ja monetaarpoliitika mõju läbi majandususalduse kanali (ingl. *risk-taking channel of monetary transmission mechanism*). Majandusubjektide monetaarpoliitika ootustega seotud probleemistik jääb käesoleva doktoritöö fookusest eemale ja seetõttu ei leia ka töös põhjalikumat käsitlemist.

Käesoleva doktoritöö teises osas on toodud kolm eraldiseisvat uurimust, mis on ülevaatena esitatud järgnevas tabelis.

Tabel 2. Ülevaade doktoritöö empiirilise peatüki uurimusest

Uurimus	**Uurimuse pealkiri ja eesmärk**	**Empiirilised andmed**
Uurimus 1	Eraisikute laenukäitumise analüüs	324 Eesti elanikku
Uurimus 2	Ettevõtete investeeringute juhtimise analüüs	44 suurettevõtet Eestis
Uurimus 3	Ettevõtete hinnakujunduse analüüs	5 väikeettevõtet Eestis

Allikas: autori koostatud

Uurimus 1 keskendub eraisikute laenuotsustele ja laiemale finantskäitumisele, kasutades uurimismeetodina eraisikute küsitlust. Uuringu esimeses osas analüüsitakse täpsemalt eraisiku võlakoormat (ingl. *private persons' indebtedness*) ja võlakoorma tajumist. Vaatamata kiirele laenukasvule, on eraisikute võlakoorem suhteliselt mõõdukas võrreldes teiste Euroopa Liidu riikidega (vaata ka lisa 2). Eraisikute võlakoorma tajumise uurimine võimaldab kindlaks määrata peamised laenuaktiivsust põhjustavad tegurid ning seeläbi on võimalik uurida laenukasvu mõjutavaid tegureid.

Uuringu teises osas uuritakse konkreetsemalt eraisiku käitumist laenuotsuse tegemisel. Kui võlakoorma tajumise näitajad viitavad pikemaajalistele laenukasvu trendidele, siis laenuotsuste analüüs väljendab konkreetse otsusega seotud asjaolusid ja laenuvõtmise motiive. Uurimuses on eraldi välja toodud intressimäärade mõju nii laenuotsustele kui ka võlakoorma tajumisele.

Uuringu kolmandas osas on vaadeldud intressimäärade mõju eraisiku üldisele finantskäitumisele läbi erinevate situatisoonikirjelduste. Ajaliste eelistuste tegemisel ratsionaalse käitumisega isikute puhul eeldatakse intressimäära mõju käitumisele ja hoiakutele. Mitteratsionaalset käitumist seletatakse isiku teadmatusega ja madala informeeritusega (vt. Campbell, 2006; Weinberg, 2005, PFRS, 2004). Kolmanda osa tulemuste põhjal saab eraisiku finantskäitumist ja selle võimalikke põhjuseid täpsemalt selgitada.

Uuringu viimane osa käsitleb riskigrupi temaatikat. Üks võimalik riskigrupi definitsioon on eraisiku finantskäitumise mitteratsionaalsus, mida selles uuringus on lähendatud intressimäära tundlikkusega. Sellise lähenemisega ei eeldata eraisiku maksehäireid või maksejõuetust, vaid lähenetakse riskigrupile kui jätkusuutmatule tarbimisele ja laenamisele. Kuna selline lähenemine on unikaalne, siis puuduvad viited teistele sama metoodikaga empiirilistele uuringutele. Intressitundliku finantskäitumise metoodikaga on uuritud riskigrupi olemasolu

eraisikute valimis, milles on eristatud nii eraisikute üldised parameetrid (vanus, elukutse, rahvus, sissetulek jms) kui ka käitumislikud parameetrid ja hoiakud.

Uurimus 2 vaatleb ettevõtete investeerimisotsuseid ja neid mõjutavaid tegureid. Uurimuses on kasutatud uurimismeetodina küsitlust, kus on analüüsitud ettevõtete poolt täidetud küsitlusankeetide tulemusi ning on tehtud nende põhjal kokkuvõtteid.

Uurimuse esimeses osas on küsitletud ettevõtete investeerimisotsuseid enim mõjutanud tegureid. Investeerimist mõjutavate tegurite loetelu koostamisel on kasutatud nii erinevates ettevõtete investeerimismudelites toodud faktoreid kui ka teiste analoogiliste empiiriliste uurimuste tulemusi. Hilisemal analüüsimisel on investeerimist mõjutavad tegurid grupeeritud äriprojekti riskiga seotud teguriteks, ettevõtte likviidsusega seotud teguriteks, ettevõtte ebakindlusega seotud teguriteks, ettevõtte kapitalikuluga seotud teguriteks ja muudeks grupeerimata teguriteks.

Uurimuse teises osas on vaadeldud sügavamalt intressimäärade mõju ettevõtete juhtimisele läbi kapitalikulu metoodika olulisuse ettevõtete finantsjuhtimisele. Uurimuses analüüsitakse kapitalikulu metoodika olulisust investeerimisotsuste tegemisel. Intressimäärade mõju investeerimisotsustele ei tähenda veel kapitalikulu metoodika olulisust ja rakendatavust ettevõtetes, kuna intressimäärade mõju võib tuleneda muudest ettevõtte finantsjuhtimisega seotud asjaoludest – intressimäärade mõju ettevõtete käitumisele on võimalik läbi otsese mõju ettevõtte kuludele ja kasumile; mõju ettevõtte kaalutud kapitalikulule; mõju ettevõtte varadele ja sealt tulenevalt likviidsuspositsioonile jne. Erinevate mõjude olulisus viitab samas aga ettevõtetes kasutatavatele finantsjuhtimise kontseptsioonidele.

Uurimuse kolmandas osas on uuritud ettevõtete investeeringute finantseerimise olulisust. Tugevate likviidsuspiirangute olemasolul sõltub ettevõtte investeerimistegevus oluliselt ettevõtte vabade omavahendite olemasolust (vt. Kjellman et al, 1995; Canh et al, 2004; Tanzi et al, 2000). Likviidsuspiirangute puudumisel peaksid ettevõttel puuduma eelistused sisemise ja välise finantseerimisallika suhtes ning vastuste analüüsimisel peaks puuduma ühe konkreetse finantseerimisallika domineerimine.

Uurimus 3 vaatleb ettevõtete hinnakujunduse eesmärke ja hinnakujunduse meetodeid. Uuring põhineb olulistel, kuid omavahel vastuolulistel varajasemate empiiriliste uuringute tulemustel, mis väidavad kululisa hinnameetodi prevaleerimist SME-de hinnakujunduses (Morris, Fueller, 1989; Carson et al., 1998; Paleologo, 2004; Avlonitis, Indounas, 2005; Guilding et al, 2005), samas aga ka kasumi maksimeerimisele orienteeritust mitme-eesmärgilises hinnakujunduses (Carson et al, 1998; Urbany, 2001; Hunt, 2002; Lere 2000; Avlonitis, Indounas, 2005). Vastuolulisus hinnakujunduse eesmärkide ja kasutatavate hinnameetodite vahel, samuti ka laialt kasutuses oleva kululisa hinnameetodi rakendamine ettevõtete hinnakujunduses on peamised uuringus käsitletavad teemad. Ettevõtete hinnakujunduse problemaatika põhjalikum uurimine võimaldab täpsemalt

mõista intressimäärade mõju hindadele ning selgitab kululisa hinnameetodi printsiibi vähest rakendatavust rahapoliitika ülekandemõjude uurimisel.

Uurimuse tulemused on analüüsitud ja kokku võetud töö viimases osas, mis koosneb kolmest peatükist. Esimeses peatükis on uurimistöö tulemusi analüüsitud uurimisülesannete ja püstitatud tööhüpoteeside lõikes. Teine peatükk käsitleb uurimistulemusi kokkuvõtvalt rahapoliitiliste siirdemehhanismide kontekstis. Kolmandas peatükis on käsitletud uurimistulemuste üldistatavusega seotud probleeme ning on antud autoripoolsed nägemused edasiseks uurimustegevuseks.

Uurimismetoodika ja kasutatavad andmed

Uurimus 1 analüüsib Eesti eraisikute laenuotsuste ja muu finantskäitumise motiive ja seaduspärasusi läbi küsitluse, mida viidi läbi 2008. a. sept.–nov. Eesti erinevates piirkondades. Kuna uuringu eesmärgiks oli modelleerida Eesti eraisikute laenukäitumist ja üldistada saadud tulemusi, siis oli oluline saada küsitluses osalejate lai representatiivsus. Ülevaade olulistest osalejate karakteristikutest on toodud alljärgnevas tabelis.

Table 3. Küsitluses osalejate üldandmed ja representatiivsus

Küsitluse andmed	Andmed Eesti kohta			
Küsitluses osalejate koguarv / Elanike koguarv:	324		1340415	
Meessoost osalejad	170	52%	617299	46%
Naissoost osalejad	154	48%	723116	54%
Eestlased	227	70%	921484	69%
Mitte-eestlased	97	30%	418931	31%
Tallinna elanikud	75	23%	398594	30%
Elanikud väljaspool Tallinna	248	77%	941821	70%
Töötajad	214	66%	605900	58%*
Tudengid	14	4%	109000	10%*
Pensionärid	24	7%	229437	22%*
Töötud	19	6%	38400	4%*
Ettevõtjad	53	16%	50600	6%*

* Hõiveseisundi struktuur on toodud 15–74 aastaste vanusegruppide põhjal (2008. aastal oli nimetatud vanusegruppides 1 042 800 inimest)
Allikas: Statistiaamet, Uurimus 1

Küsitlus ise koosnes 5-st osast, sisaldades osalejate üldandmeid, nende laenukoormust ja hinnanguid sellele, üldist laenukäitumist, laenamise motiive ja üldist finantskäitumist. Tulemuste hindamisel ja interpreteerimisel kasutati erinevaid statistilisi meetodeid uurimisväidete analüüsimiseks.

Uurimus 2 analüüsib ettevõtete investeerimiskäitumist läbi 200 suurema Eesti ettevõtte küsitluse, mis viidi läbi 2001. a. Küsitlusele vastas 44 ettevõtet. Antud uurimus sisaldab peale ettevõtete investeerimiskäitumise ka ettevõtete hinnangut intressimäärade olulisusele juhtimisotsustes ning likviidsuspiirangute mõju hindamist ettevõtte investeerimisotsustele.

Uurimus 3 analüüsib ettevõtete hinnakujundusega seotud probleemistikku. Uurimuse eesmärgiks oli välja selgitada vastuolulised tulemused eelnevatest uuringutest ettevõtetes kasutatavate hinnameetodite ja hinnakujunduse eesmärkide vahel ning selgitada vastuoluliste hinnakujundusmeetodite samaaegset rakendatavust ettevõtete hinnakujunduses. Nimetatud vastuolude selgitamine annab võimaluse hinnata hinnakujundusmeetodite rakendatavust ka Eesti ettevõtetes, kus sarnaselt teistes riikides tehtud uuringutulemustele on populaarseim hinnakujundusmeetod kululisa meetod (Dabusinskas, Randveer, 2009). Uurimus viidi läbi 2006. a. viies erinevas Eesti ettevõttes, mis esindasid erinevaid tööstusharusid ning ei omanud domineerivat turupositsiooni ega tegutsenud sektoris, kus mõnel ettevõttel oleks domineeriv turupositsioon. Uurimismeetodina kasutati poolstruktureeritud intervjuud, mis viidi läbi ettevõtte juhtide ja/või omanikega. Saadud intervjuude tulemusi analüüsiti ja süstematiseeriti, kus tulemuste interpreteerimisel on kasutatud nii üksikjuhtumi meetodit (ingl. *case-study analysis*) kui ka juhtumite koosmõju meetodit (ingl. *cross-study analysis*).

Töös püstitatud uurimisväited ja nende analüüsi tulemused

Käesoleva töö esimeses osas toodud varajasema erialase kirjanduse põhjal formuleeriti nii ettevõtete kui ka eraisikute käitumise kohta seitse erinevat hüpoteesi kirjeldamaks intressimäärade mõju ettevõtete ja ka eraisikute käitumisele. Tööhüpoteesid on jagatud kahte suuremase gruppi vastavalt ettevõtete investeerimisotsustele ja eraisikute laenuotsustele. Käesolevas alapeatükis tutvustatakse uurimishüpoteeside tulemusi ja analüüsitakse uurimuste tulemusi laiemalt. Esimesena vaadeldakse uurimisülesannet, mis keskendub eraisikute laenuotsustele Eestis. Seda uurimisülesannet on käsitletud läbi nelja uurimishüpoteesi, mida omakorda on analüüsitud käesoleva töö empiirilises ja kokkuvõtvas osas.

P1a: Madalad intressimäärad ei ole laenukasvu põhitegur

Madalate intressimäärade seost laenukasvuga on eelkõige rõhutatud rahaturu monetaristlikes käsitlustes (vt. Meltzer, 2000; Mehrling, 2005) ja teistes intressimäära olulisust eraisikute krediidikäitumises rõhutavates uuringutes (vt. Catte et al, 2004; Mishkin, 2007). Siiski enamus varajasemaid nii mikrotaseme

uuringuid kui ka makrotaseme uuringuid leiavad, et intressimäärad üksi ei suuda kirjeldada laenuturu käitumist. See uurimishüpotees leidis kinnitust ka käesolevas töös, kus intressimäärade olulisus nii üldise laenuaktiivsuse määramisel kui ka konkreetse laenuotsuse tegemisel on väheoluline, võrreldes teiste eraisikute laenukäitumist mõjutavate teguritega.

P1b: Suurenenud tarbimine ei ole laenukasvu põhitegur

Jätkusuutliku laenamise ja krediiditarbimise iseloomustamiseks kasutatakse ühe meetodina laenamise ja tarbimise vaheliste seoste uurimist, kus laenamise ja tarbimise koosmõju võiks põhjustada krediidikäitumise mittelineaarsust ning viidata selgelt laenamise jätkusuutmatusele. Mitmetes empiirilistes uuringutes on kasutatud kaubabilansi puudujääki (Duenwald et al, 2005; Coricelli et al, 2006a) tarbimise lähendamiseks ning on leitud, et tarbimine ei ole seotud suurenenud laenukasvuga. Samas käesolevas töös oleva uurimuse tulemused viitavad tugevale tarbimismotiivile krediidiotsuste langetamisel, kus tarbimismotiiv prevaleerib tugevalt kõikide teiste laenuotsust ja üldist võlakoormat mõjutavate tegurite ees. Käesolevas doktoritöös on püütud vastuolulisi uurimistulemusi ka selgitada, kus ühe võimaliku põhjusena erinevate uurimustulemuste vahel võib tuua SKP lähendamisega seotud asjaolu. Mitmetes empiirilistes uurimustes traditsiooniliste finantskäitumisteooriate baasilt eraisikute laenukäitumist uurides kasutatakse SKP-d sissetulekute lähenduses (vt. Calza et al, 2003; Fritzer, Reiss, 2007). Teistes sama valdkonna uurimustes kasutatakse SKP-d jälle tarbimise lähenduses (vt. UN HDR). Diametraalselt erinevad uurimistulemused ei luba töö autoril põhjalike täiendavate uuringuteta tööhüpoteesi kategooriliselt kinnitada. Tuginedes eeltoodule, saab tööhüpoteesi lugeda vaid osaliselt kinnitatuks.

P1c: Eraisiku üldist finantskäitumist mõjutavad oluliselt intressimäärad

Tööhüpotees intressimäärade mõjust üldisele finantskäitumisele tuleneb nii traditsioonilistest finantskäitumise teooriatest kui ka ratsionaalse käitumise eeldusest. Hüpoteesi testiti käesolevas töös läbi erinevate käitumissituatsioonide analüüsi. Testi tulemused ei kinnita tööhüpoteesi. Saab väita, et intressimäärad ei mõjuta oluliselt üldist finantskäitumist ega tarbimishoiakuid. Kuigi tulemus tundub esmapilgul üllatav, siis mitmed hiljutised uuringud rõhutavad eraisikute finantskäitumise keerukust ja vastuolulisust (vt. Wadhwani, 2002; Weinberg, 2006; Campbell, 2006). Üheks vastuolulise ja ebaratsionaalse finantskäitumise põhjuseks peetakse finantskkäitumise komplekssuse kõrval eraisikute madalaid teadmisi ja vähest informeeritust (Kempson, Whiley, 1999; Whiley, Brooker, 2004; Collard, Kempson, 2005; Weinberg, 2006; Campbell, 2006). Nimetatud väidet kontrolliti samuti käesoleva töö uurimuses. Uurimistulemuste põhjal ei leia kinnitust väide, et riskigruppi kuuluvate inimeste ebaratsionaalne finantskäitumine oleks põhjustatud madalast teadmiste tasemest või ebapiisavast finantsinformeeritusest. Pigem leidis kinnitust tõsiasi, et riskigruppi kuuluvate inimeste enesekindlus oli finantsasjade korraldamisel kõrgem, kui riskigruppi mittekuuluvatel inimestel.

P1d: Krediidituru riskigrupid on määratud finantskäitumisega ja käitumishoiakutega

Eraisikute finantskäitumise viimane tööhüpotees käsitleb riskigrupi ühte võimalikku määratlemise metoodikat ja tulemuste järgi riskigruppi kuuluvate inimeste identifitseerimist. Riskigrupi üldlevinud definitsioon puudub, kuid üldtunnustatud lähenemise kohaselt loetakse riskigruppi kuuluvateks inimesi, kelle finantskäitumine võib olla ajendatud teistest motiividest, kui traditsioonilistes laenumudelites eeldatakse. Siia kuuluvad klassikaliselt madala sissetulekuga ja töö kaotanud isikud, madala haridustasemega isikud, keeleoskuseta isikud, noored jne. (vt. Kempson, Whiley, 1999; Bridges, Disney, 2003; Kalafatelis et al, 2004; Collard, Kempson, 2005). Käesolevas töös defineeriti riskigruppi kui väliskeskkonna suhtes immunseid isikuid, kelle finantskäitumisel ja tarbimisharjumustel on väga madal intressitundlikus. Analüüsi põhjal võib järeldada, et üldiste karakteristikute põhjal on riskigrupis mõnevõrra rohkem mehi ja ettevõtjaid kui kogu valimis, samas vanus, rahvus, elukoht ja ülalpeetavate arv ei olnud üldvalimist oluliselt erinev. Kuna sissetulekud otseselt uuringus ei sisaldunud, siis sissetulekute lähendamiseks kasutati võetud laenude suurust. Sissetulekute osas ei leidnud kinnitust väide, et riskigruppi ei saaks eristada üldvalimist sissetulekute põhjal, samas polnud sissetulekud piisavad eristamaks riskigruppi üldvalimist. Eeltoodut arvestades ei tohiks reeglina kasutada *a priori* riskigruppe ning riskigrupi määratlemine üldiste karakteristikute põhjal (näiteks sissetulekud või vanus) peab olema enam põhjendatud. Käesoleva doktoritöö üheks originaalseks tulemuseks saab aga pidada riskigruppide määratlemist finantskäitumise ja käitumishoiakute põhiselt. Läbiviidud uuringu tulemusena saab väita, et eraisikute finantskäitumise riskantsust määrab üldistest *a priori* karakteristikutest paremini teatud käitumisharjumused ja tarbimishoiakud.

Käesoleva doktoritöö teine uurimisülesanne, mis seisnes ettevõtete investeerimisaktiivsust määravate komponentide selgitamisel ja analüüsil, sisaldab kolme uurimisväidet ja väiteid on käsitletud Uurimuses 2. Alljärgnevalt on antud lühike ülevaade uurimisväidetest ja analüüsitud saadud tulemusi laiemalt.

P2a: Kapitalikulu tegurid ei mõjuta oluliselt ettevõtete investeeringuotsuseid

Kuigi erinevad ettevõtete investeerimiskäitumist käsitlevad mudelid sisaldavad olulise komponendina kapitalikulude mõju investeeringutele, siis käesolev tööhüpotees on formuleeritud mitmete empiiriliste ettevõtete investeerimiskäitumist käsitlevate uuringute tulemuste põhjal, mille järgi kapitalikulude mõju investeeringutele on ebaoluline (vt. Bernake, Blinder, 1988; Oliner et al, 1995; Kjellman et al, 1995; Guiso et al, 2002; Gilshrist et al, 2008; Bopkin et al, 2009). Uurimuse 2 tulemused kinnitavad samuti kapitalikulu tegurite vähest mõju investeerimisotsuste tegemisel. Olulisteks käitumisteguriteks Eesti ettevõtete investeerimisotsuste tegemisel on pigem investeerimisprojekti riskidega seonduvad aspektid, samuti ka ettevõtte likviidsuspiirangud ning ettevõtete üldise majandususaldusega seotud probleemistik. Kuigi empiirilise uurimuse valimis oli ettevõtete struktuur oluliselt erinev teistes samalaadsetes uuringutes

toodud ettevõtete struktuurist, ei saa väita, et nimetatud asjaolu peaks mõjutama investeeringute tundlikkust kapitalikulu tegurite suhtes. Siiski ei saa täielikult antud uurimishüpoteesi kinnitada, kuna valimis osalenud ettevõtete arv oli selleks liiga väike.

P2b: Kapitalikulu kontseptsioon on ettevõtete finantsjuhtimises põhikontseptsioon

Kui eelnevas uurimisväites hinnati kapitalikulude olulisust ettevõtte investeerimisotsuse kujundamisel, võrreldes teiste võimalike investeerimisotsust mõjutavate teguritega, siis käesolev uurimisväide käsitleb kapitalikulu metoodika olulisust ettevõtte investeerimisotsuste tegemisel ja üldises finantsjuhtimises. Tuginedes kapitalikulu kontseptsiooni tihedale seotusele ettevõtte omanike rikkuse maksimeerimisega ning erinevate varajasemate uurimustööde tulemusele (vt. Hall, Jorgenson, 1967; Fazzari et al, 1987; Gilshrist, 1999; Love, 2001; Tevlin, Whealan, 2003; Schaller, 2006), on uurimisväites eeldatud kapitalikulu kontseptsiooni kasutamist ettevõtete juhtimises. Uurimuse 2 tulemused aga kinnitavad, et intressimäärade mõju ettevõtete kapitalikulu kontekstis on ettevõtete finantsjuhtimisele väheoluline ning intresse käsitletakse eelkõige kui finantskulu komponenti. Seega saab väita, et kapitalikulu kontseptsioon ei oma üldiselt ettevõtete finantsjuhtimises olulist mõju ja tööhüpotees käesolevas töös kinnitust ei leidnud.

P2c: Ettevõtete likviidsuspiirangud mõjutavad oluliselt investeerimisotsuseid

Tuginedes mõningatele varajasematele uurimustele, mis on kasutanud sarnast ettevõtete vahetu analüüsimise metoodikat (vt. Kjellman et al, 1995; Canh et al, 2004; Tanzi et al, 2000), on käesolevas tööhüpoteesis väidetud likviidsuspiirangute tugevat mõju ettevõtete investeerimistegevusele. Üheks levinud meetodiks likviidsuspiirangute mõju määramiseks on ettevõtte finantseerimisallikate domineerimise uurimine, kus omavahendite eelistamine investeerimistegevusel viitab ettevõtte likviidsuspiirangute olemasolule (vt. Nielsen, 1999; Kohler et al, 2000). Uurimuse tulemusel eelistab 65% vastanutest investeeringuid finantseerida pigem omavahenditest kui kasutada muid finantseerimisvorme. Eeltoodu kinnitab tugevat likviidsuspiirangu olemasolu Eesti ettevõtetes ja seeläbi kinnitab ka käesolevat tööhüpoteesi. Uurimusest ei ilmne, kas likviidsuspiirangute domineeriv mõju võib olla põhjustatud üleminekumajandusele iseloomuliku kiire ettevõtete arengu kaasnähtusena (vt. Valdemarra, Kaufmann, 2004; Cahn et al, 2004).

Kolmas uurimisülesanne puudutab ettevõtete hinnakujundust ja hinnakujundusmeetodite kasutamist. Hinnameetodite kasutamise analüüs annab võimaluse hinnata intressimäärade mõju ettevõtete hinnakujundusele. Nimetatud probleemistikku on käsitletud Uurimuses 3 läbi kuue olulise, kuid omavahel vastuolulise uurimistulemuse varajasematest empiirilistest uurimustest. Siinkohal tuleb veel kord märkida, et ettevõtete hinnakujundust on uuritud olulise turujõuta SME-des.

Efa: Ettevõtete hinnakujunduse eesmärgiks on kasumi maksimeerimine
Eelnevatele uuringutele toetudes saab väita kasumi maksimeerimise prinsiipi kui ettevõtte peamist hinnakujunduse eesmärki (vt. Meidan, 1996; Carson et al, 1998; Avlonitis, Indounas, 2005), kuigi on välja toodud ka teisi hinnakujunduse eesmärke (vt. Avlonitis, Indounas, 2005, pp. 53; Diaz, 2006, pp. 216). Kompromissina erinevate hinnakujunduseesmärkide vahel on pakutud hinnakujunduse mitmeseid eesmärke (ingl. *multiple-objective pricing*), mis omakorda komplitseerib hinnakujunduseesmärkide rakendatavust nende omavahelise vastuolulisuse tõttu (vt. Diamontopolus, 1991; Keil et al, 2001). Ühe lahendusena on välja pakutud erinevate eesmärkide erinevat ajalist dimensiooni (Diamontopolus, 1991; Diaz, 2006), kus ainult pikemaajalise hinnakujunduseesmärgina prevaleerib ettevõtte kasumi maksimeerimine. Uurimuse 3 tulemused kinnitavad kasumi maksimeerimist ettevõtete hinnakujunduse eesmärgina. Uuring viitas ka mitmete vastuoluliste hinnakujunduseesmärkide samaaegsele kasutamisele ettevõtetes, mida siiski peaks pigem käsitlema ettevõtete igapäevaste juhtimisdilemmade osadena.

Efb: Kululisa hinnameetod on enamkasutatav hinnameetod ettevõtetes
Käesolev tulemus tugineb arvukatele empiirilistele uuringutele, milles on leitud, et kululisa hinnameetodi kasutamine domineerib oluliselt teiste hinnakujundusmeetodite ees (Carson et al, 1998; Avlonitis, Indounas, 2005; Guilding et al, 2005; Diaz, 2006). Mõningad uurimused väidavad, et kululisa hinnameetodit kasutatakse paralleelselt teiste hinnameetoditega (Paleologo, 2004; Carson et al, 1998). Uurimuse 3 tulemused kinnitavad kululisa hinnameetodi kasutamise domineerimist ettevõtetes, kuid samas kululisa hinnameetodi implementeerimine ettevõtete hinnakujunduses on oluliselt tagasihoidlikum. Uurimuses selgub, et isegi väikestes ettevõtetes kasutatakse mitmetasemelist hinnakujundust, kus üks nn. kiire hinnakujundus (ingl. *quick pricing*) jälgib võimalikke toote otsekuludega seotud hinnakujundust ja pikemaajalisem hinnakujundus (ingl. *long-term pricing*) jälgib muid hinnakujundusega seotud aspekte. Kui kiire hinnakujunduse puhul on meetodiks valdavalt kululisa meetod, siis pikemajalise hinnakujunduse meetodid olid pigem muud hinnakujundusmeetodid. Mitmetasemelise hinnakujunduse kasutamine selgitamaks erinevate hinnakujundusmeetodite rakendamist ettevõttes on käesoleva doktoritöö üks originaalsetest tulemustest ning pole varajasemates uuringutes kasutatud.

Efc: Enamus ettevõtteid kasutab samaaegselt mitmeid hinnakujundusmeetodeid
Mõningad uurimused kinnitavad erinevate hinnakujundusmeetodite samaaegset rakendamist ettevõtetes (Paleologo, 2004; Carson et al, 1998), kus hinnakujundusmehhanism erinevate hinnakujundusmeetodite rakendamisel on täpsemalt kirjeldamata. Käesolevas töös on uuritud erinevate hinnakujundusmehhanismide samaaegset kasutamist ja rakendamist ettevõtetes. Erinevate hinnakujundusmeetodite samaaegne rakendamine ettevõtetes leidis käesolevas doktoritöös kinnitust läbi mitmetasemeliste hinnakujundusprotsesside. Samuti

leidis kinnitust väide, et kululisa hinnameetod on laialdaselt rakendatav ettevõtte hinnaläbirääkimistes (vt. Urbany, 2001a; Herrmann et al, 2007), kus hinnamuutuste argumenteerimisel peetakse parimaks kulupõhist hinnapõhjendust.

Efd: Kululisa hinnameetodi rakendatavus on tööstusharuti erinev
Mitmed varajasemad empiirilised uuringud on kinnitanud erinevat hinnameetodite kasutamist sõltuvalt tööstusharust (vt. Diamantopulus, 1991; Brierly et al, 2001; Lere, 2000; Guilding et al, 2005, pp. 130–133), põhjendades seda erinevate kulustruktuuride, keskmiste ettevõtete suuruse jms. Uurimuse 3 tulemused kinnitavad tööstusharude lõikes erinevat aktiivsust erinevate hinnakujundusmeetodite kasutamisel. Erinevate tööstusharude ettevõtete hinnakujunduse määrab käesoleva doktoritöö uuringutulemustele toetudes tööstusharule omane kulustruktuur, kusjuures määrav on toote otsekulude avatus välistele kulusisenditele. Seega erinevates tööstusharudes sarnase kulustruktuuriga, kuid erineva otsekulude osakaaluga ettevõtete hinnakujundusmeetodite rakendatavus on erinev. Kõrgete toote otsekuludega tööstusharudes on kulusisendite mõju hinnakujundusele suurem kui madalate toote otsekuludega tööstusharus. Kõrgete kaudsete kuludega tööstusharu hinnakujundus ei sisalda reeglina nn. kiiret hinnakujundusmeetodit ja kululisa hinnameetodi kasutamine hinnakujunduses on tagasihoidlik.

Efe: Intressimäärad mõjutavad otseselt ettevõtete hinnakujundust ja hindasid
Käesolev väide on tuletatud otseselt kululisa hinnameetodi aktiivsest kasutamisest ettevõtete poolt, kus mõnedes varajasemates uurimustes on kululisa meetod ka väga üheselt kirjeldatud – ettevõtete ühikkulude kasv tõstab ettevõtete toodangu/teenuse hindasid (v.t. Avlonitis, Indounas, 2005, pp. 52; Lucas, 2003; Pasura, Ryals, 2005, pp. 47; Guilding et al, 2005, pp. 125–127). Nimetatud uuringud ei erista erinevaid kulusid ja nende erinevat mõju hinnakujundusele. Mõned uuringud väidavad vaid hinnakujunduse komplitseeritud rakendamist SME-des (Lere, 2000; Brierly et al, 2001). Uurimuse 3 tulemused aga ei kinnita intressimäärade mõju hinnakujundusele isegi siis, kui kululisa hinnameetodi rakendatavus ettevõttes on kõrge. Uurimuses ilmnes, et mitmetasemelisele hinnakujundusele vaatamata on toote ühikkulusid kaudselt mõjutavate kulude jälgimine ja rakendamine ettevõtete hinnakujunduses üsna problemaatiline. Kõik analüüsitud ettevõtted ei reageerinud hinnakujunduses kaudsete kulude hinnamuutusele (sealhulgas ka intressimäära muutustele). Seega kululisa hinnameetodi rakendamisel on mõned kulud (eelkõige kaudsed kulud) vähemalt lühiajaliselt diskrimineeritud ja ei ole kasutatavad kululisa hinnameetodi rakendamisel.

Eff: Valuutakursid mõjutavad hinnakujundust tööstusharuti erinevalt
Ka see uurimistulemus valuutakursside mõju kohta ettevõtete hinnakujundusele on seletatav kahetasemelise kululisa hinnameetodi rakendamisega ettevõtetes.

Uurimuse 3 tulemuste kohaselt tööstusharu esindavad ettevõtted, kus imporditava kauba osakaal on suur ja imporditav kaup moodustab suure osa ettevõtte muutuvkuludest (toote otsekuludest), on valuutakursside mõju ettevõtete hinnakujundusele väga kõrge. Ka ettevõtetes, kus imporditava kauba osakaal pole eriti suur, kuid importkaup moodustab osa ettevõtte muutuvkuludest, on samuti tuntav valuutakursside mõju ettevõtte hinnakujundusele.

Tulemuste diskussioon ja soovitused järgnevateks uuringuteks

Kui eelnevas alapeatükis oli käsitletud uurimisülesannetel põhinevaid uurimishüpoteese ja olulisi uurimisväiteid ning toodud välja uurimishüpoteeside testimise tulemused koos laialdase tulemuste analüüsiga, siis käesolevas alapeatükis vaadeldakse saadud ettevõtete ja eraisikute käitumisaspektide tulemusi monetaarpoliitika mõjukanalite kontekstis. Kuna monetaarpoliitika erinevad mõjukanalid toimivad reeglina läbi intressimäärade mõju majandussubjektide käitumisele, siis on antud alapeatükis käsitletud ainult majandussubjektide käitumise intressitundlikke aspekte. Intressimäärade mõju majandussubjektide käitumisele on analüüsitud nii eraisikute kui ka ettevõtete lõikes. Alapeatüki lõpus on esitatud doktoritöö autoripoolsed soovitused tulevasteks uuringuteks.

Eraisikute finantskäitumise analüüsi tulemused baseeruvad Uurimuse 1 tulemustele. Tabelis 4 on toodud kokkuvõtlikult monetaarpoliitika mõjukanalite olulisus arvestades uurimustulemusi.

Tabel 4. Eraisikute finantskäitumise analüüsi tulemused tuginedes monetaarpoliitika mõjukanalite olulisusele Eestis

Rahapoliitika erinevad mõjukanalid	**Käsitluse meetod käesolevas doktoritöös**	**Käsitluse tulemusena on mõju:**
Otsene rahapoliitika siirdemehhanism	Analüüsitud	Oluline
Klassikaline intressimäärade kanal	Analüüsitud	Ebaoluline
Vahetuskursside kanal	Käsitletud	Oluline
Krediidikanal	Analüüsitud	Ebaoluline
Varamõjude kanal	Käsitletud	Ebaoluline
Majandususalduse kanal	Analüüsitusd	Pigem oluline

Allikas: autori koostatud

Klassikalist (ehk Keynesi) intressimäärade kanali olulisust monetaarpoliitika mõjukanali rakendumisel eraisikute käitumisel analüüsiti käesolevas doktoritöös põhjalikult ning kokkuvõtlikult võib väita kanali ebaolulisust. Eraisikute üldise laenukoormuse hindamisel pidasid vaid 2,8% laenukohustustega vastajatest oluliseks intressimäärasid (4,0% kõigist vastanutest). Konkreetse laenuotsuse tegemisel pidasid ainult 5,8% vastajatest oluliseks soodsaid intressimäärasid. Samuti polnud intressimäärad nii laenukoormuse hindamisel kui ka laenuotsuse kujundamisel olulisemate käitumist mõjutavate tegurite hulgas. Saadud tulemus seab uude perspektiivi varajasemad uuringutulemused, kus intressimäärade kanalit monetaarpoliitika siirdemehhanismide hindamisel Eestis on peetud oluliseks (vt. Basdevant, Kaasik, 2002; Pikkani, 2001; Lättemäe, 2001). Siinkohal tuleb rõhutada olulisi metoodilisi erinevusi varajasemate uuringutega. Uuringutes, kus on kasutatud parameetrite määramiseks Kalmani filtrit (vt. Basdevant, Kaasik, 2002), puudub diskussioon parameetrite mõju hindamise kohta isiku käitumisele. Teiste uuringute metoodika, kus kasutatakse intressimäärade läbistamisvõime (ingl. *interest rate pass-through*) hinnangut (vt. Pikkani, 2001; Sepp et al, 2004) ei ole doktoritöö autori arvates piisav andmaks hinnangut intressimäära kanali efektiivsuse kohta pikemas perspektiivis.

Uurimuse 1 küsitlusest ilmnes, et kuigi enamikul vastajatest on ligipääs mõõdukale krediidiressursile, eelistab enamik küsitletutest seda mitte kasutada (küsitlus viidi läbi 2008. a. lõpus). Oluline põhjus tarbimisotsuste ja krediidiotsuste edasilükkamisel on isikute ebakindlus nii isikliku tulevase sissetuleku osas kui ka majandusolukorra suhtes üldiselt. Nimetatud asjaolud indikeerivad eraisikute finantskäitumises krediidikanali suhtelisele ebaolulisusele eraisikute finantskäitumises, kuna suur osa küsitletutest ei taju finantspiiranguid (ingl. *financial constraints*) oma finantsotsuste tegemisel. Samas tuleb lisada, et finantspiirangute osas rajaneb nimetatud seisukoht absoluutse finantspiirangu käsitlusele (ingl. *financial constraints on strong form*), mis ei hõlma kogu finantspiirangute probleemistikku. Finantspiirangute mõju täpsem hindamine eraisikute laenuotsustele võiks olla üks suund tulevasteks uurimistöödeks. Oluliseks tulemuseks peab käesoleva töö autor eraisikute finantsotsuste tegemisel üldise majandususalduse konteksti ja selle mõju eraisiku finantskäitumisele. Majandususalduse kanali mõju monetaarpoliitia mõjukanalite uurimisel on käsitletud uurimistöödes harva ja töö autori arvates täiesti põhjendamatult. Käesoleva uurimistöö tulemusel võib väita, et majandususalduse kanali mõju eraisikute käitumisele on vähemalt küsitluse tegemise momendil olulisem krediidikanali mõjust.

Eraisiku laenukoormuse hindamisel pidasid 47% vastanutest oluliseks igakuuse finantskohustuste teenindamiseks vajamineva makse absoluutset suurust, millele on intressimääradel samuti otsene mõju. Intressimäärade mõju igakuusele teenindusmaksele on vahetu, mõjutades eraisikute sissetulekut muudeks kulutusteks (ingl. *influence to disposable income*). Nimetatud asjaolu viitab võimalikule otsese rahapoliitika mõjukanali olulisusele (ingl. *direct monetary transmission channel*), mis on leidnud kinnitust ka varajasemates uuringutes Kesk- ja Ida-Euroopa riikide mõjukanalite efektiivsuse kohta (vt. Cenic, 2008).

Varamõjude kanali ja valuutakursside kanali (mõningates uuringutes käsitletakse valuutakursside kanalit ühe varamõjude kanali osana) osas käesolevas doktoritöös otseselt uurimusi läbi viidud pole. Valuutakursside kanali efektiivsuse eraisikute käitumise mõjutamisel määrab paljuski eraisikute üldine hinnatundlikkus, mis väheneb sissetulekute suurenemisel (EKI, 2005). Arvestades Eesti elanike sissetulekut ning majanduse avatust, võib eeldada valuutakursside kanali suhtelist efektiivsust teiste monetaarpoliitika mõjukanalite suhtes, mis on kooskõlas varajasemate teiste empiiriliste uuringute hinnangutega valuutakursi kanali efektiivsuse kohta Eestis (Sepp et al, 2004; Dabusinskas, Randveer, 2009). Varamõjude kanali efektiivsust käsitledes on lähtutud käesolevas töös seisukohast, mille järgi Eesti elanike säästude ja muude varade osakaal on väike (Coricelli et al, 2006b) ning seetõttu ei mõjuta oluliselt eraisikute tarbimist (Paabut, Pikkani, 2007).

Ettevõtete finantskäitumise analüüsi tulemused baseeruvad Uurimusele 2 ja Uurimusele 3, kus Uurimuses 2 analüüsitaks ettevõtte investeeringutega seotud probleemistikku ning Uurimuses 3 ettevõtete hinnakujundust ja hinnakujundusmeetodite rakendatavuse aspekte Eesti ettevõtetes. Tabelis 5 on kokkuvõtlikult toodud monetaarpoliitika siirdemehhanismide kanalite olulisus, arvestades uuringute tulemusi.

Table 5. Erinevate monetaarpoliitika mõjukanalite olulisus Eestis, tuginedes ettevõtete finantskäitumise analüüsi tulemustele

Rahapoliitika mõjukanalid	**Käsitluse meetod käesolevas doktoritöös**	**Käsitluse tulemusena on kanal**
Otsene rahapoliitika siirdemehhanism	Analüüsitud	Pigem ebaoluline
Klassikaline intressimäärade kanal	Analüüsitud	Ebaoluline
Vahetuskursside kanal	Analüüsitud	Oluline
Tobini q kanal	Käsitletud	Ebaoluline
Krediidikanal	Analüüsitud	Oluline
Majandususalduse kanal	Analüüsitud	Pigem oluline

Allikas: autori koostatud

Klassikalist (ehk Keynesi) intressimäärade kanali olulisust monetaarpoliitika mõjukanalite rakendumisel ettevõtete käitumises on analüüsitud põhjalikult Uurimuses 2, kus uuriti kapitalikulu erinevate komponentide mõju ettevõtete investeerimisotsustele. Kapitalikulu erinevate komponentide mõju ettevõtete investeerimisotsustele oli madal, võrreldes teiste investeerimisotsust mõjutavate teguritega. Samuti oli kapitalikulu meetod ebaoluline üldises ettevõtte finantsjuhtimises. Seega võib kokkuvõtlikult väita intressimäärade kanali ebaolulisust ettevõtete finantskäitumises. Kapitalikulu komponentide ebaolulisust ja intressimäära kanali vähest efektiivsust ettevõtete käitumisele näitavad ka teised

samalaadsed uuringud (vt. Wilkes et al, 1996; Tevlin, Whealan, 2003; Schaller, 2006). Intressimäärade mõju hindamisel ettevõtete käitumisele ilmnes pigem intressimäärade vahetu mõju jälgimine finantskuludele ja seeläbi ettevõtte kasumile, mis viitab otseste rahapoliitika mõjukanalite (ingl. *direct monetary transmission channel*) aspektidele. Vaatamata otsese rahapoliitika mõjukanali aspektide avaldumisele ettevõtete finantsjuhtimise praktikas, tuleb kanali mõju pidada pigem ebaoluliseks seoses intressimäärade üldise vähese mõjuga ettevõtete finantskäitumisele. Intressimäärade kanali vähetuntava mõjuga ettevõtete finantsotsuste tegemisel, kus ettevõtte kapitali kulu mõju ettevõtete juhtimisotsustele on pigem ebaoluline, on põhjendatav ka vähene võimalik monetaarpoliitika siirdemehhanismide mõju läbi Tobin'i Q kanali Eesti ettevõtetele.

Olulisteks ettevõtete investeerimistegevust mõjutavateks teguriteks investeerimisprojekti riskantsuse kõrval hindasid ettevõtted investeerimisprojekti finantseerimisega seotud küsimusi ning üldist majandusolukorra ebakindlust. Investeerimisprojekti finantseerimisega seotud küsimusi ja finantspiirangute mõju ettevõtte käitumisele on Uurimuses 2 käsitletud ka põhjalikumalt, kus ilmnes tugev ettevõtete eelistus sisemistele ressurssidele finantseerimaks võimalikke investeerimisprojekte (65% vastanud ettevõtetest eelistas pigem kasutada sisemisi vahendeid investeeringute finantseerimiseks). Nii sisemiste ressursside kasutamise olulisus kui ka üldise majandusolukorra ebakindluse hindamine ettevõtete investeerimisotsuste tegemisel viitavad nii krediidikanali kui ka majandususalduse kanali olulisusele monetaarpoliitika siirdemehhanismide käsitlemisel Eestis. Kui krediidikanalite olulisus on leidnud laialdast analüüsi mitmetes empiirilistes uuringutes (vt. Lättemäe, 2001; Sepp et al, 2004; Ramanauskas, 2006; Detken, 2004; Cenic, 2008; Doyle, 2009), siis majandususalduse kanali mõju analüüs on käesoleva töö autori meelest jäänud põhjendamatult tahaplaanile.

Valuutakursside mõju ettevõtete käitumisele on käsitletud Uurimuses 3, kus läbi olulise ettevõtete reaktsiooni väliskeskkonna mõjudele – ettevõtete hinnakujunduse – on uuritud valuutakursside mõju ettevõtete finantskäitumisele. Kuigi valuutakursside mõju ettevõtetele sõltub imporditavate kulukomponentide suhtelisest osakaalust toote otsekuludele ja toote otsekulude osakaalust ettevõtte kogukuludele[21], saab väita monetaarpoliitika mõjukanali avaldumise suhtelist efektiivsust läbi valuutakursside kanali. Saadud tulemus on kooskõlas teiste uurimistulemustega, kus väidetakse valuutakursside kanali suhtelist efektiivsust nii Eestis (Sepp et al, 2004), kui ka teistes siirderiikides (Amato, Gerlach, 2001; Coricelli et al, 2006b; Ramanauskas, 2006), ning selgitab valuutakursside kanali vähenevat efektiivsust edasise majandusarengu tingimustes.

Edasise uurimistegevuse kavandamisel nii majandussubjektide käitumise käsitlustes kui ka monetaarpoliitika siirdemehhanismide mõju hindamisel tuleb rõhutada asjaolu, et nii majandussubjektide käitumine kui siirdemehanismid on

[21] Nimetatud kulustruktuur on sõltuv nii tööstusharust (Diamantopulus, 1991; Brierly et al, 2001; Lere, 2000; Guilding et al, 2005) kui ka riigi üldisest majandusarengust (Coricelli et al, 2006b; Diaz, 2006)

ajas muutuvad (Bernake, Gertler, 2000; Mojon et al, 2001; Ganev et al, 2002; Ireland, 2004; Matousek, Sarantis, 2006). See piirab ühelt poolt uurimistulemuste ajalist rakendatavust, kuid teisalt tingib vajaduse nii majandussubjektide käitumise kui ka siirdemehhanismide efektiivsuse pideva jälgimise, kujundamaks ja hindamaks monetaarpoliitika mõju majandusele. Samuti peab käesoleva töö autor oluliseks nii majandussubjektide käitumise kui ka siirdemehhanismide analüüsil kasutada erinevaid uurimismeetodeid ja -metoodikaid. Erinevate meetodite ja metoodikate rakendamine võimaldab mitmekülgsemalt hinnata uurimisobjekti parameetreid ning välistada uurimismeetodi iseärasustest tulenevaid võimalikke vääraid interpreteeringuid või kallutatud tulemusi. Seega üheks võimalikuks uurimissoovituseks on antud valdkonna edasine uurimine, kasutades selleks erinevaid metoodikaid.

Teine suurem grupp võimalikest uurimissoovitustest tuleneb otseselt Tabelist 4 ja Tabelist 5, kus mõned monetaarpoliitika siirdemehhanismi kanalid on põhjalikult käsitlemata. Üks edasine uurimistöö teema võiks olla seotud eraisikute finantskäitumise analüüsiga dünaamiliste kinnisvarahindade tingimustes. Kinnisvarahindade mõju eraisikute finantskäitumisele on väga erinevate võimalike avaldusvormidega (vt. Mishkin, 2007) ja seetõttu võib mõju eraisikute finantskäitumisele jääda kergesti vajaliku tähelepanuta. Kinnisvarahindade mõju eraisikute finantskäitumisele on peetud oluliseks mitmes varajasemas uuringus arenenud riikide kohta (Bernake, Gertler, 2000; Catte et al, 2004; Havrylchyk, 2004; Weinberg, 2006) ning on seotud olulise mõjuga kogu majanduse käekäigule (Campbell, 2006; Borio, Zhu, 2008). Samas uuringud siirdemajandusega riikide kohta on pidanud varade mõju väheoluliseks (Coricelli et al, 2006b) või viidanud ebapiisavatele usaldusväärsetele andmetele (Egert, Mihalje, 2008). Teise olulise valdkonnana monetaarpoliitika mõjukanalite uurimisel peab käesoleva töö autor majandususalduse kanali efektiivsuse uurimist nii teoreetilisel kui ka empiirilisel tasemel. Majandususalduse kanali uurimise muudab keeruliseks sobivate hindamismetoodikate vähene käsitlus, kus majandususalduse kanali ja krediidikanali mõju on raskesti eristatav. Samas osundasid käesolevas doktoritöös sisalduvad Uurimuse 1 ja Uurimuse 2 tulemused majandususalduse kanali olulisusele erinevate monetaarpoliitika mõjukanalite analüüsimisel, kus majandususalduse kanali olulisus ettevõtete käitumisel oli samaväärne krediidikanali olulisusega ning eraisikute finantskäitumisel majandususalduse kanali olulisus ületas krediidikanali olulisuse.

Kolmas edasise uurimistegevuste suund võiks olla kõrge lisandväärtusega teadusmahukate ettevõtete finantskäitumise modelleerimine ja vastavalt toetavate majanduspoliitikate kujundamine. Sellist fokuseeritud lähenemist ettevõtete finantskäitumise analüüsimisel on kasutatud erinevates varasemates uuringutes, kus vaatluse all on olnud nii erinevad majandussektorid ja tööstusharud kui ka erinevates arengustaadiumides olevad ettevõtted (vt. Love, 2001).

Viimane oluline edasine uurimisfookus käesoleva doktoritöö autori arvates on seotud eraisikute finantskäitumisega, sealhulgas erinevate riskigruppide finantskäitumisega. Krediidituru riskigruppide finantskäitumine on saanud põhjendamatult vähe tähelepanu kõikides Kesk- ja Ida-Euroopa siirdemajandu-

sega riikides. Käesoleva doktoritöö uurimistulemused viitavad *a priori* riskigruppide kasutamise ebapiisavusele ning osundavad võimalusele defineerida riskigruppe käitumishoiakute ja finantskäitumise tegurite järgi. Samas ei pretendeeri käesolevas doktoritöös toodud metoodika käitumispõhise riskigrupi defineerimise metoodikaks. Arvestades asjaolu, et majanduse elavnemisel eraisikute majandususaldus taastub ning Eesti eraisikute krediidikohustused pigem kasvavad tulevikus, süveneb vajadus põhjalikumate eraisiku krediidikäitumise jälgimise ja analüüsi järgi. Samuti kasvavad tulevikus nii riskigruppi kuuluvate isikute laenukoormus kui ka võimalikud majanduslikud ja sotsiaalsed probleemid krediidipõhisesse riskigruppi kuuluvatel inimestel ja sellest tulenevalt kogu majandusel ning ühiskonnal tervikuna.

CURRICULUM VITAE

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Language Skills

Estonian, English, Finnish, Russian

Education

2005–2010	doktoral studies at University of Tartu
1992–1995	University of Tartu, MA (Economics); dissertation "Informational Asymmetry in Securities Market"
1988–1992	University of Tartu, BA (Physics)

Continuing Education

1. "The History of Economic Policy in the Context of a History of Economic Thoughts", Prof. Erik S. Reinert, Tallinn Technical University, October, 2009
2. Doctoral Summer School of Tartu University, June, 2009, Väimela
3. "Academic Writing", Lawrence Smith, May, 2007, Prague
4. "Value-based management implementation in multinational companies", Mercuri International, 2004, Helsinki

Teaching

1. Since 1992 courses "Investments" and "Strategical Financial Management" in full- or part-time lecturing, University of Tartu
2. Since 1994 the course "Business Environment in Baltic Countries", Seinajoen Ammatikorkeakoulu, Finland
3. Short-time courses at Estonian Business School and Audentes

Main Research Interests

- Economic and monetary policy of transition countries
- Financial Theory and Corporate Finance
- Behavioural finance

Employment

1999–2009	Kuusakoski OY
2007–2009	Kuusakoski Group OY financial manager
2000–2007	CEO of Kuusakoski Baltic Holding
1999–2000	CEO of Valior Group AS
1998–1999	Forekspank (Optiva Pank, Sampo Pank) financial manager, member of the board
1995–1998	ETK
1997–1998	ETK member of the board and CFO
1995–1997	ETK Hulgi AS financial manager
1992 –1996	University of Tartu, lecturer (main subjects: Investments; Strategic Financial Management)

Other activities

- Sport-club “Kimber Club”, member of the board
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2005–2010	Tartu Ülikooli doktorantuur
1992–1995	Tartu Ülikool, MA (Majandus), teema: "Väärtpaberituru Informatsiooniline Assümeetrilisus"
1988–1992	Tartu Ülikool, BA (Füüsika)

Erialane enesetäiendamine

1. TTÜ kursus "The History of Economic Policy in the Context of a History of Economic Thoughts", Prof. Erik S. Reinert, TTÜ, 2009. a. oktoober, Tallinn
2. Doktorantide suvekool, TÜ, 2009. a. juuni, Väimela
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4. Mercuri International kursus "Value-based management implementation in multinational companies", 2004. a., Helsinki

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2. Alates 1994. a. õppeaine "Business Environment in Baltic Countries", Seinajoen Ammatikorkeakoulu
3. Lühiajalised loengutsüklid EBS's, Audenteses

Peamised uurimisvaldkonnad

- Siirderiikide majandus ja rahapoliitika
- Finantsjuhtimisteooria ja ettevõtte rahandus
- Käitumuslik rahandus

Töökäik

1999–2009	Kuusakoski OY
2007–2009	Kuusakoski Group OY finantsjuht
2000–2007	Kuusakoski Baltic Holding juhataja (Balti riikide ja Poola tütarettevõtete juhtimine)
1999–2000	Valior Grupi tegevdirektor
1998–1999	Forekspank (Optiva Pank, Sampo Pank) juhatuse liige ja rahandusdirektor
1995–1998	ETK
1997–1998	ETK juhatuse liige (tööstus ja rahandus)
1995–1997	ETK Hulgi rahandusdirektor
1992–1996	Tartu Ülikooli lektor (õppeained: Investeeringud; Strateegiline Finantsjuhtimine)

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- Spordiklubi “Kimberi Klubi” juhatuse liige
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DISSERTATIONES RERUM OECONOMICARUM UNIVERSITATIS TARTUENSIS

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