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VENTURE CAPITAL INVESTMENT ON SME

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ABSTRACT

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This thesis studies venture capital investment on small and medium-sized enterprises (SMEs). The specific objective of the study is to test whether venture capitalists have a positive effect on SMEs. In addition effect of several other factors is studied in financial crisis. Used determinants are formulated based on three capital structure theories. The pecking order theory concerns favoring on financing source over another. The agency theory and the tradeoff theory concentrate on the search of optimal capital structure.

The data of this study consist of financial statement data and results of corporate questionnaire. Regression analysis was used to find out the effects of several determinants. Regression models were formed based on the presented theories. SMEs with and without venture capitalists were considered separately. It was found that venture capitalists have a positive effect on SMEs. Although some results between SMEs with and without venture capitalists were mixed.

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Tämä tutkielma tarkastelee pääomasijoituksia pieniin ja keskisuuriin yrityksiin (pk-yrityksiin). Tutkielman erityinen tarkoitus on testata, että onko pääomasijoittajalla positiivinen vaikutus pk-yrityksiin. Lisäksi useiden muiden tekijöiden vaikutus testattiin rahoituskriisissä. Käytetyt determinantit ovat muodostettu kolmen eri pääomarakenne teorian avulla. Pecking order – teoria käsittelee rahoituslähteiden suosimisjärjestystä. Sekä tradeoff – teoria että agenttiteoria tähtäävät optimaalisen pääomarakenteen selvittämiseen.

Tämän tutkielman aineisto koostuu tilinpäätöstiedoista ja yrityskyselyn tuloksista. Regressioanalyysiä käytettiin useiden tekijöiden vaikutusten selvittämiseen. Regressiomallit muodostettiin esitettyjen teorioiden pohjalta. Pk-yrityksiä tarkasteltiin erikseen ilman pääomasijoittajaa ja pääomasijoittajan kanssa. Tutkielmassa havaittiin, että pääomasijoittajalla on positiivinen vaikutus pk-yrityksiin. Kuitenkin osa tuloksista oli ristiriidassa keskenään.

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1 INTRODUCTION

1.1 Background and motivation

Optimal capital structure for Small and Medium-sized Enterprises (SMEs) is probably one of the most contentious issues, if not a puzzle, in finance. Numbers of researchers (Jensen & Meckling 1976; Demsetz 1983; Fama & Jensen 1983; Myers 1984; Barton & Gordon 1988 and Harris & Raviv 1991 among others) have been studying capital structure, but unfortunately the main focus has been with larger companies. Zingales (2000) asserts that, "*empirically, the emphasis on large companies has led us to ignore (or study less than necessary) the rest of the universe: the young and small firms, who do not have access to public markets*". However, comparing venture capitalists' affect on SMEs earnings and capital structure have caught less attention in the academic field, especially since the start of the financial crisis.

Venture capital is a notable part of financing among SMEs. First venture capital investments were made just after World War II, and since then overall venture capital investment activity has grown. Venture capital investments have suffered some temporary downturns during market crash years in 1974, 1987, 2000 and 2007. Another remarkable year in venture capital history was year the 1958 when the US congress passed the Small Business Investment Act which allowed licensing of SMEs. (Venture Capital Investment Firms)

SMEs are significant part of the Finnish economy. SMEs are defined as enterprises which have fewer than 250 employees, and have either an annual turnover not exceeding EUR 50 million, or an annual balance-sheet total not exceeding EUR 43 million (Statistics Finland). In the 2007 99, 7% of Finnish companies were SMEs and they employed 62% of all private-sector employees. These companies generated 49% of the combined turnover of all the Finnish businesses, and SMEs covered more than 13% of Finland's export revenue. (Federation of Finnish Enterprises)

Starting early 90's, SME studies have gotten more attention in academic research. Generally, SMEs and entrepreneurial activities are said to be important to economic development (Hamilton and Harper, 1994). Some empirical studies have been made on the capital structure of SMEs with varied and inconsistent results (Chittenden et al., 1996; Cressy and Olofsson, 1997; Jordan et al., 1998, Michaelas et al., 1999; Esperanc¸a et al., 2003; Hall et al., 2004; Sogorb-Mira, 2005).

In the recent financial crisis money in the all fields; banks, investors, venture capitalists, insurance companies and other big players, searched for better and better yields. Rizzi (2009) studied private equity markets and found that "*the mega buyout years of 2003 through the first half of 2007 were driven by the same economic forces which underlied the subprime movement. Lulled into a false sense of security by benign economic conditions of the "Great Moderation," investors and institutions increased their risk appetite in search of yield*".

SMEs, venture capitalist and financial crisis all have huge effects on the economy. These are crucial part of the modern economy and that is one of the reasons that this study must be done. It is also fascinating to see how SMEs, venture capitalist and financial crisis affect each other and it is important to understand the reasons and consequences for that.

1.2 Objectives

This thesis investigates if venture capital investments affect the development of SMEs positively. The thesis will also view the presence of venture capitalists affect on the capital structure of SMEs and other company determinants in the financial crisis. The research question will be:

- Do venture capitalists have a positive effect on SMEs?
- Can SMEs with venture capitalist survive better in a financial crisis than SMEs without venture capitalist?

1.3 Structure of the thesis

The rest of the study has been organized as follows. Capital structure and venture capital theories are presented in section 2 to provide background information. The financial crisis is covered in section 3. In section 4, the productivity measures are presented and section 5 goes through research data and methodology. The results of the study are in section 6 and section 7 is for conclusion of this study, which is followed by references.

2 THEORETICAL BACKGROUND

2.1 Capital structure theories

The capital structure decision for SMEs could be a crucial factor in the future; bad choices can ruin or destroy the potential of the small firm. Luckily researchers have made many theories about capital structure, but there is no universal theory of capital structure and no reason to expect one (Myers 2001).

Cassar and Holmes (2003) stated that generally, the theories of the capital structure and financing choices of large firms also apply to SMEs. The biggest difference concerns the conflicts between owners and management. Usually, SMEs tend to have a less pronounced separation of ownership and management than larger firms. These theories can be described either in terms of a static tradeoff theory or pecking order theory.

The static tradeoff theory encompasses several aspects, including the exposure of the firm to bankruptcy and agency costs against the tax benefits associated with debt use. On the other hand the pecking order theory suggests that firms have a particular preference order for financing choices used to finance the firm. (Myers 1984)

2.1.1 The Static Tradeoff Theory

Modigliani and Miller stated their famous propositions about optimal capital structure in 1958. In their research, their definition of homogenous classes of stock was that in the perfect capital market the price per dollar's value of expected return must be same for all stocks of any given class. Or in any given class the price of every stock must be proportional to its expected return. However, the market value of any company is independent of its capital structure and is given by capitalizing its expected return at the appropriate rate to its class. Basically, it can be said that the company value is the "average cost of capital" which is the ratio of its expected return to the market value of all its securities. Based on these

assumptions Modigliani and Miller (1958) announced their proposition I. In perfect market conditions, when there are no taxes, the average cost of capital to any company is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class. (Modigliani & Miller 1958)

Modigliani and Miller (1958) stated in their proposition I that a completely leveraged company and a completely unleveraged company are same value. According to this, capital structure does not matter to company's value. In 1963 Modigliani and Miller fulfilled their proposition I with proposition II. The expected return of equity is higher for a leveraged company than an unleveraged company, therefore the risk of equity holders is also higher with a leveraged company. However, the value of a stock does not increase in spite of the greater return to one stock. The risk from larger amount of debt is compensated to equity holders by increasing their expected return of equity. Despite of these propositions, in the real world the capital market is not perfect and empirical studies have shown that capital structure has an effect on the market value of a company. (Modigliani & Miller 1963)

Myers (1984) stated that a company's optimal debt ratio is often viewed as determined by a tradeoff of the benefits and costs of borrowing, holding the company's investment plans and assets constant. The companies are balancing between tax shields and various costs of bankruptcy and try to find the optimal structure. The companies are supposed to substitute equity for debt, or debt for equity, until they have found the optimum balance. Figure 1 illustrates that the market value of a firm increasing towards the optimum when the firm takes more debt. After the optimum, the costs of debt become larger than the benefits of the given tax shield. When the firm is crossing the optimum point, the market value of the firm starts to decrease when increasing debt too much. (Myers 1984)
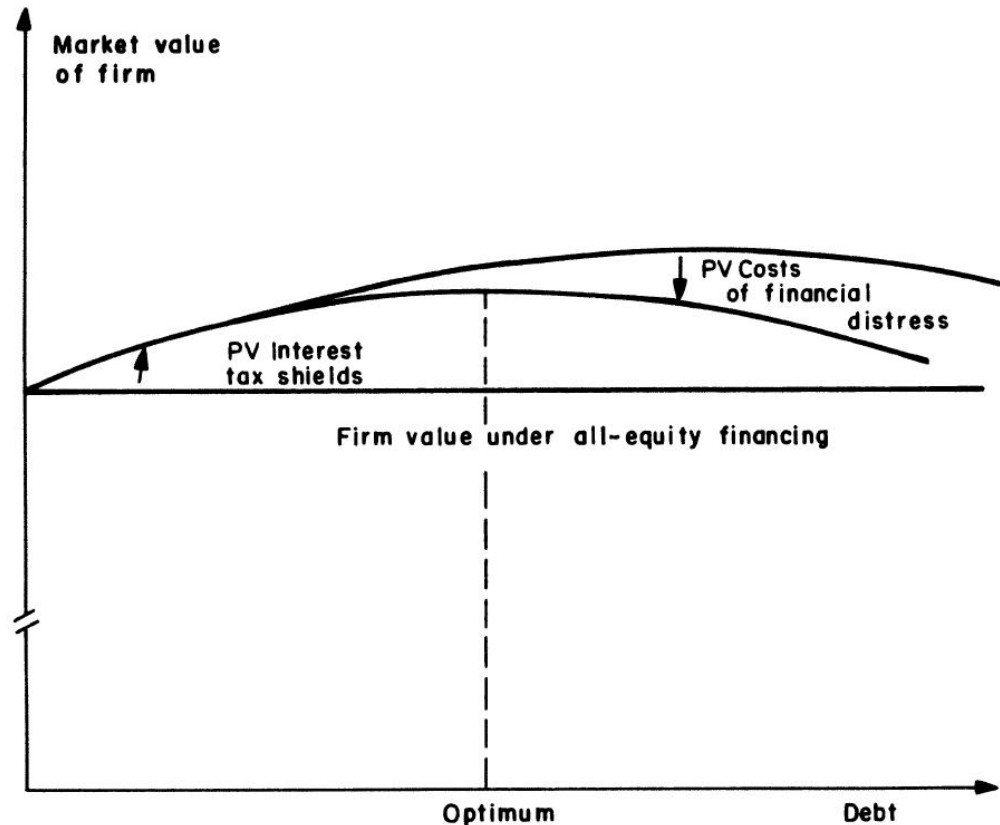
Figure 1. The static-tradeoff theory of capital structure.

While theorizing more about tax shields, Miller (1977) made an extreme implication from the original MM theory. Miller made interest tax shields so extreme that it could not be explained why not all companies are in deep debt. He described the equilibrium of aggregate supply and demand for corporate debt, in which personal income taxes are paid by the marginal investor in corporate debt just to offset the corporate tax saving. However, because the equilibrium only determines aggregates, debt policy should not matter for any single taxpaying company. Unfortunately this only works if we assume that all firms face approximately the same marginal tax rate, but we can reject that immediately. (Miller 1977)

Figure 2 shows the net tax gain from corporate borrowing against the expected realizable tax shield from the future deduction of one dollar of interest paid. There are firms which receive a high amount of tax deductions, but there are also firms which do not pay any taxes. However,

for all companies the expected realizable tax shield is positive[1], but small. In the Modigliani and Miller proposition II (MM Theory), any tax-paying corporation gains by borrowing; the higher the marginal tax rate, the greater the gain. This is illustrated by the top line in figure 2. In Miller's theory, the personal income taxes on interest payments would exactly offset the corporate interest tax shield, provided that the firm pays the full statutory tax rate. However, any firm paying a lower rate would see a net loss to corporate borrowing and a net gain to lending. This sets the bottom line. Also, compromised theories have been made and those are not that extreme compared to the other two theories.[2] (Myers 1984)
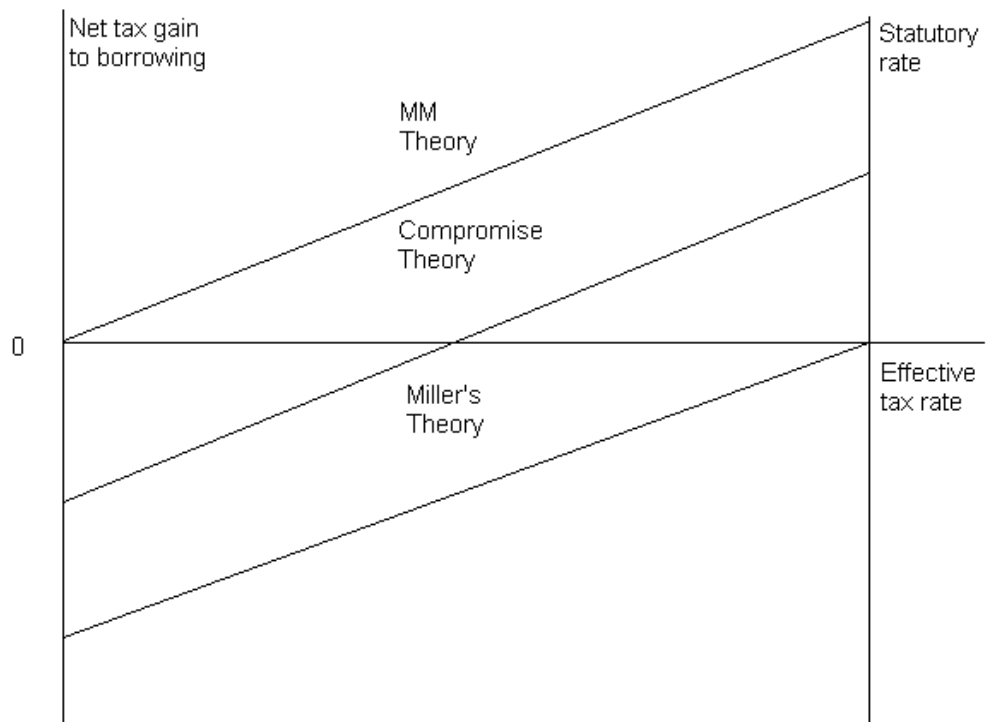

Figure 2. The net tax gain to corporate borrowing.

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[1] Regardless of the theory, the slope is upward so it is always a positive.
[2] See compromise theories, advanced by Modigliani and Miller (1966), D'Angelo and Masulis (1980), Modigliani (1982) and Mackie-Mason (1990).

Solomon (1963) summed one argument as follows: *"one kind of evidence in favor of the traditional position is that companies in the various industry groups appear to use leverage as if there is some optimum range appropriate to each group. While significant intercompany differences in debt ratios exist within each industry, the average usage of leverage by broad industrial groups tends to follow a consistent pattern over time."* Other authors, such as Schwartz and Aronson (1967), have documented evidence of the strong industry effects in debt usage, which they interpret as evidence of optimal ratios. Long and Malitz (1985) showed that research and development expenditures relate negatively to leverage ratios as they use those as a proxy for intangible assets. A negative relationship between growth opportunities and debt ratios was found by Smith and Watts (1992).

Bradley et al. (1984) found evidence from earlier theoretical and empirical literature that supports the modern balancing tradeoff theory of capital structure. However, Titman and Wessels (1988) found only mixed evidence for the role of the factors predicted by the static tradeoff theory when they used a latent variables approach. Other studies have found more direct evidence that firms adjust their debt ratios toward the optimum. Taggart (1977), Marsh (1982), Jalilvand and Harris (1984) and Auerbach (1985) find mean reversion in debt ratios or evidence that firms appear to adjust toward debt targets.

Optimal capital structure has been studied in various different points of views. The traditional models suggest that firms choose their optimal capital structure by comparing various tax and incentive benefits of debt financing against possible bankruptcy costs. There have also been studies about dynamic models of capital structure (see Fischer et al. 1989; Leland 1994 and 1998) where researchers have found evidence that firms will periodically readjust their capital structures toward a target ratio that reflects the costs and benefits of debt financing found in the static tradeoff models.

Hovakimian et al. (2001) tested the hypothesis that companies tend to move toward a target debt ratio when they either raise new capital or retire or repurchase existing capital. They took into account for the previous studies that companies may change over the time, causing their target ratios to change. Also, previous studies have found[3] that companies consist of both assets in place and growth opportunities and have argued that debt ratios are likely to be determined as a function of the changing relative weights of these two components of value. More specifically, companies should use relatively more debt to finance assets in place and relatively more equity to finance growth opportunities. (Hovakimian et al. 2001)

Shyam-Sunder and Myers (1999) argue that pecking order theory provides a better empirical description of capital structures than do traditional tradeoff models. However, Hovakimian et al. (2001) presents results suggesting, that although pecking order considerations affect corporate debt ratios in the short-run, companies tend to make financing choices that move them toward target debt ratios that are consistent with tradeoff models of capital structure choice.

An empirical hypothesis test has been made for 3,569 Spanish SMEs over a 10-year period. Its findings reveal that SMEs also aim to reach the optimum leverage. However, this takes a little longer time to reach the optimum due to high transaction costs. Also non-debt tax shields, growth opportunities, internal resources, size and age all seem to play important roles in determining SME capital structure. (Lopéz-Cracia and Sogorb-Mira 2008)

According to Abor and Biekpe (2009), who investigate SMEs in Sub-Saharan Africa, SMEs try to finance their fixed assets with long-term debt and their current assets with short-term debt. This result supports the previous empirical studies (see Chittenden et al., 1996; Jordan et al.,

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[3] See Myers (1977) and Myers and Majluf (1984).

1998; Michaelas et al., 1999; Cassar and Holmes, 2003; Hall et al., 2004; Sogorb-Mira, 2005).

Beattie et al. (2006) stated that when they surveyed UK listed companies, about half of the firms sought to maintain a target debt level, which is consistent with tradeoff theory. They also mentioned that the capital structure decision is a complex multi-dimensional problem.

2.1.2 The Pecking Order Theory

Even though pecking order theory was found in the 80's, there were similar indications in earlier studies. Donaldson (1961) observed that managers prefer internal financing as the source of new funds. This is consistent with findings made by Myers, the developer of the pecking order theory. Myers (1984) stated that firms prefer internal finance, adapting their dividend policy and if external finance is required, firms issue the safest securities first. He also stated that when outside funds are necessary, companies prefer debt over equity because of lower information costs associated with debt issues.

SMEs often suffer problems linked to asymmetric information, which causes information costs. Usually managers have better information about the health and prospect of the company than investors do. The pecking order theory predicts a hierarchical order in a company's financial policy. This order is led by the financial sources that are least subject to information costs and at the same time, involve less risk. The most preferred funding source is internally generated funds followed by low-risk, short-term debt and then higher-risk long-term debt. (Donaldson 1961 and Myers and Majluf 1984)

The pecking order theory is derived by assuming a commonality of interests between current shareholders and managers (insiders), but asymmetric information and therefore, heterogeneous expectation between insiders and potential new investors (outsiders). Due to information asymmetries, outsiders know less about the firms' prospects than the owner-manager. The owner-manager will try to maximize the

insiders (also current shareholders) value, not the outsiders' value. If the firm has good investment prospects, the owner-manager will not want to issue new shares because some of the benefits will have to be shared with the new investors. So the owner-manager will prefer internally generated funds, followed by debt and the last option would be new shares. But if prospects are poor, the owner-manager will want to issue new shares since it would benefit the current shareholders. (Watson and Wilson 2002)

Cosh and Hughes (1994) and Frank and Goyal (2003) assert that the natural financial behavior of SMEs can be described by the pecking order theory. They argue that SMEs are likely affected by typical asymmetric information problems like adverse selection and moral hazard. According to Stiglitz and Weiss (1981) banks respond to both of these problems with collateral because it overcomes both problems of moral hazard and adverse selection. Diamond (1989) stated that reputation could also help SMEs in these problems.

Cassar and Holmes (2003) argue that owners or managers of SMEs may have constrained skills in financial decision-making or financial structures compared to larger companies. They base this on the idea that managers or owners of SMEs may not normally operate with these skills on a day-to-day basis. They find empirical evidence that asset structure, profitability and growth are important influences upon SME financing and capital structure. They also found weaker evidence of size and risk influencing financing and capital structure choice.

For SME owners, some financial options may not be acceptable for personal reasons. Also, there were similar indications made in previous studies (see Bird and Juttner, 1976; Holmes and Kent, 1991; Haron and Shanmugan, 1994 and Kotey; 1999) where the focus was more descriptive and explanatory. For example, Holmes and Kent (1991) surveyed Australian manufacturers for sources of start-up and additional debt and equity funding and the reasons for their use. Also, Kotey (1999)

later examined the role of demand side factors such as personal values and financial planning on forms of debt utilized by SMEs in New South Wales, with no consideration of the financial characteristics of respondents.

Fama and French (2002) found that the pecking order theory assumes the dividend to be sticky and variation in earnings and investments are dealt with debt. They also found that when controlling investment opportunities, more profitable firms have lower debt to assets ratios. As the pecking order model predicts, Fama and French (2001) found that firms which pay a dividend tend to have high earnings relative to investment.

Beattie et al. (2006) found that firms are heterogeneous in their capital structure policies. 60% of responding firms stated that they follow a financing hierarchy which is consistent with pecking order theory. They also gather findings, see tables 1a and 1b, from previous studies on capital structure determinants.

Table 1a. Table presents the findings of prior survey research on capital structure determinants in USA.

Findings of prior survey research on capital structure determinants in USA (Beattie et al. 2006).

Author(s)	Year	Respondents	Response Rate	Conclusions Drawn by Author(s)
US Settings				
Donaldson	1961	25 large US corporations	na	Hierarchy of financing sources. **Supports pecking order theory**.
Scott & Johnson	1982	CFO's of 212 of Fortune 1000 firms	21 %	Firms have target leverage ratios and accept the notion of optimal capital structure. **Supports trade-off theory**.
Pinegar & Wilbricht	1989	CFO's of 176 of Fortune 500 firms	35 %	Evidence supports the use of a financing hierarchy. **Supports pecking order theory**.
Norton	1989	CFO's of 98 of Fortune 500 firms	21 %	Some evidence of target ratios, hierarchy of sources. No evidence of a trade-off or asymmetric information or agency costs. **Mixed evidence.**
Graham & Harvey	2001	CFO's of 392 of Fortune 500 firms and 4400 FEI members (4587 population)	9 %	Target debt ratio to maintain financial flexibility. Moderate importance of tax implications, less emphasis on financial distress. Interest cost of debt of moderate importance. **Supports trade-off theory**. Moderate evidence that debt issued when recent profits insufficient and equity issues affected by market valuation. No significant consideration of agency costs/benefits or corporate control. **Supports pecking order theory.**

Table 1b. Table presents the findings of prior survey research on capital structure determinants outside USA.

Findings of prior survey research on capital structure determinants outside USA (Beattie et al. 2006).

Author(s)	Year	Respondents	Response Rate	Conclusions Drawn by Author(s)
Settings other than US				
Fawthrop & Terry	1975	54 major UK companies	na	Use of debt ratios to constrain debt limits. Importance of maintaining financial flexibility.
Stonehill et al.	1975	Firms in US, Japan, France, Norway, Holland	na	No debt ratios maintained, take advantage of favorable opportunities to issue debt or equity. **Conflicting both pecking order theory and trade-off theories.**
Allen	1991	48 listed Australian corporations	na	Some evidence on target debt ratios and tax implications of debt. Most concern with maintaining spare debt capacity. Internal funds marginally favored. **Supports pecking order theory.**
Allen	2000	132 Australian, 67 large UK, 53 Japanese	24%, 13%, 10%	UK and Australian firms maintain spare debt capacity to be in a position to seize opportunities or make acquisitions. **Supports pecking order theory**. Not so in Japanese firms.
Bancel & Mittoo	2004	87 firms across 16 European countries	12 %	Financial flexibility/EPS dilution major concerns in debt/equity decisions. Country's legal environment important determinant of debt policies. Costs and benefits trade off determines financing. **Supports trade-off theory.**
Brounen et al.	2004	313 firms across UK, Netherlands, France and Germany	5 %	Financial flexibility major debt determinant, but not driven by asymmetric information. Firm size and shareholder orientation important influences on financing but national influences weak. **Supports trade-off theory but also evidence of pecking order behavior.**

2.1.3 The Agency Theory

An agency relationship is a contract under which one or more persons (the principal(s)) authorize another person (the agent) to accomplish some service on their behalf, which involves giving some decision making authority to the agent. If both parties of the relationship are utility maximizers there might be a problem because the agent may not act the best interest of the principal. The principal can establish some incentives for the agent or in some situations, expand the agent resources to guarantee the desired agent actions. However, it is basically impossible for the principal or the agent, at zero costs, to make sure that the agent will make optimal decisions on the principal's point of view. (Jensen and Meckling 1976)

According to Van Osnabrugge (2000) when dealing with the potential effects of moral hazard and/or adverse selection, the principal can limit divergences from his own interests by incurring screening costs to reduce the asymmetries of information between the principal and agent.

Jensen and Meckling (1976) identified two types of conflicts. Conflicts between shareholders and managers form because managers do not own 100% of the shares. Consequently, they do not capture entire gain from their actions, but they still bear all the associated costs. This could lead the managers to consume the firm resources to their own perquisites such as corporate jets or fancy offices. As a result of these actions, managers do not maximizes the firm value. This inefficiency is reduced by larger fraction of the firm's equity owned by the manager. (Harris and Raviv 1991)

In Harris and Raviv (1990a) and Stulz (1990) studies, managers and investors disagree over operating decisions. Harris and Raviv assumed that managers want to always continue the firm's current operations even though liquidation would be a better option for investors. On the other hand Stulz presumed that managers want to invest all available funds regardless of if it would be better to pay out the cash to investors. In both

of these studies it is assumed that these conflicts cannot be solved by contracts. Harris and Raviv posit that debt mitigates the problem by giving investors (debtholders) the option to force liquidation if the cash flow is poor. In Stulz's, like in Jensen (1986), study debt payments reduce free cash flow. Capital structure varies by calculating these benefits and costs of debt. In Harris and Raviv's study investors have the control to decide the value of the firm and whether to liquidate the company when in bankruptcy. In Stulz's study, the cost of debt is that debt payments may more than exhaust "free" cash, reducing the funds available for profitable investments. This comparison of Harris and Raviv and Stulz is summarized in table 2 where the relationship of these two models to Jensen and Meckling (1976) and Jensen (1986) is also shown. (Harris and Raviv 1991)

Table 2. Table presents the comparison of agency models which based on manager-shareholder conflicts.

Comparison of agency models based on manager-shareholder conflicts (Harris and Raviv 1991).

Model	Conflict	Benefit of Debt	Cost of Debt
Jensen and Meckling (1976)	Managerial perquisites	Increase managerial ownership	Asset subsitution
Jensen (1986)	Overinvestment	Reduce free cashflow	Unspecified
Harris and Raviv (1990a)	Failure to liquidate	Allows investors option to liquidate	Investigation costs
Stulz (1990)	Overinvestment	Reduce free cashflow	Underinvestment

Barnea et al. (1981) pointed out that agency problems are more severe whenever the asymmetric information is greater. The agent may have the capacity and incentive to affect wealth transfers between parties and the corporate contract. Also, the agent's partial ownership allows him to consume firm assets while paying less than the sum of the individual costs to the firm's principals. Michaelas et al. (1999) expect agency costs to be

higher for SMEs because the owner-manager is likely to put his own interest first, especially in the early years when survivor is at stake.
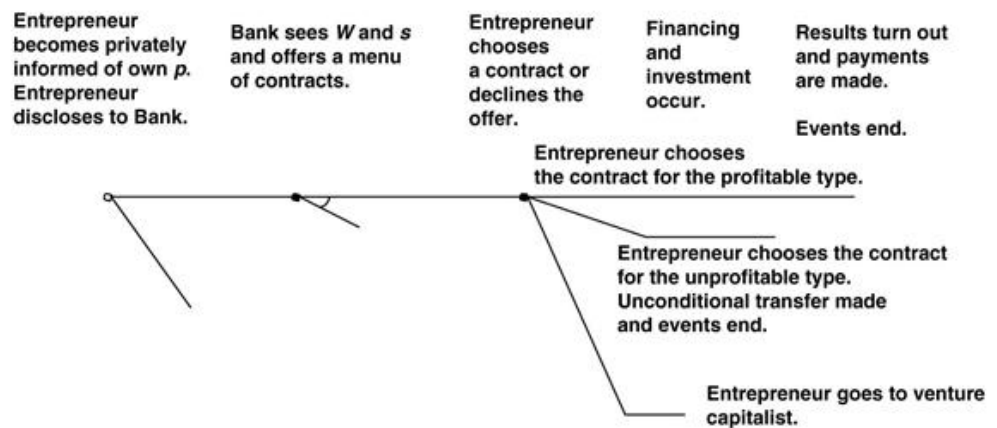
Other types of conflict arise between debt holders and equity holders. Firms have to pay interest to debt holders hence they prefer less risky investments. This is because, in bankruptcy, they lose their investment and regardless of the risk level of firm investments, they only receive their interest. All the profits from riskier investments pass to equity holders. Also, managers have their influences in deciding whether to invest a safer or a riskier project. Considering the firm's future, managers also consider their own reputation. Suppose that from the point of view of the manager's reputation there is only success or failure. Thus the manager maximizes probability of success while the shareholders prefer to maximize expected return. If the safer project has a higher probability of success, the manager will choose that even if the other project would be better to shareholders. (Jensen and Meckling 1976 and Harris and Raviv 1991)

Myers (1977) advised for caution regarding problems that may arise between shareholders and debtholders. He warns that too strict covenants or monitoring devices to debtholders might be obstacles when deciding growth opportunities in the future. Chan (1983) studied the role of venture capitalists in lessening the problem of asymmetric information. He compares an economy with screening agents (venture capitalists) with one without them and shows that introducing them enhances welfare. Holmstrom and Tirole (1997) developed a model of financial intermediaries that can monitor an entrepreneur's effort. In their paper, along with Ueda (2004), they predict that entrepreneurs finance through a venture capitalist if they are short on collateral.

In 2004 Ueda presented a sequence of events of how an entrepreneur seeks funding. First, as in figure 3, (date 0) the entrepreneur goes to the bank and discloses his project. Then the bank seeks collateral and evaluates if this project would be profitable. Also the bank should consider the information asymmetric between the entrepreneur and the bank. If
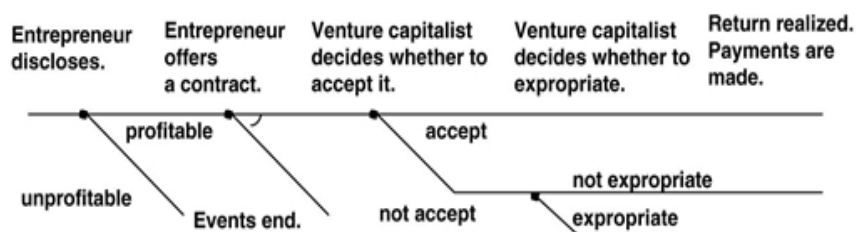
they do not succeed with the contract, the entrepreneur will meet with the venture capitalists (date 1). When the entrepreneur rejects the banks evaluation of whether the project was profitable or unprofitable or the offer was not good enough, the entrepreneur will negotiate with the venture capitalist. The venture capitalist is often in a better position than banks are because even if the negotiation breaks up, the venture capitalist may still benefit from the entrepreneur's project by expropriating it, where there is not such an option for the bank. (Ueda 2004)

Figure 3. Date 0 and date 1. *p=profitable, W= collateral, s=signal*

Entrepreneur becomes privately informed of own *p*. Entrepreneur discloses to Bank.

Bank sees *W* and *s* and offers a menu of contracts.

Entrepreneur chooses a contract or declines the offer.

Financing and investment occur.

Results turn out and payments are made.

Events end.

Entrepreneur chooses the contract for the profitable type.

Entrepreneur chooses the contract for the unprofitable type. Unconditional transfer made and events end.

Entrepreneur goes to venture capitalist.

The figure 4 presents the negotiation between the entrepreneur and venture capitalist. If the project turns out to be unprofitable the negotiation ends. If it is profitable the entrepreneur makes "take it or leave it" offer of a contract to the venture capitalist (date 2). Unlike the negotiation with the bank, there is no asymmetric information and no adverse selection problem. Here it is assumed, for simplicity, that the contract takes a parsimonious form. (Ueda 2004)

Figure 4. Date 2.

Entrepreneur discloses.

Entrepreneur offers a contract.

Venture capitalist decides whether to accept it.

Venture capitalist decides whether to expropriate.

Return realized. Payments are made.

profitable

accept

unprofitable

not expropriate

Events end.

not accept

expropriate

2.2 Venture capital financing

Venture capital improves a nation's innovative capacity by making investments in early stage businesses that offer high potential, but also high risk. There are informal venture capital investors who are wealthy, private individuals often known as business angels. There are also official venture capital firms, funds and organizations.

According to Mason and Harrison (2002), business angels and formal venture capitalists differ in a host of ways, including investment experience, resources, governance, investment philosophy and objectives, and the approach to investment decision-making. They report that formal venture capitalists have more experience with investments by venture capitalists outnumbering those of business angels by a margin of 23 to 4. Formal venture capitalists make their decisions purely based on the economic consideration. Likewise business angels are not responsible to anyone and might make some of the decisions based on other reasons than economics. This idea is consistent with Wetzel (1981) and Sullivan (1994) who both found that some business angels are willing to make a trade-off between financial and non-financial returns. Business angels are less concerned with financial projections and are less likely to calculate rates of return. They do less detailed due diligence, have fewer meetings with entrepreneurs and are more likely to invest on "gut feeling". Finally, formal venture capitalists have more investment capacity than business angels so business angels might not be able finance further rounds if necessary for growth. (Mason and Harrison 2002)

2.2.1 Informal venture capitalist

Informal venture capitalists are defined as private individual with no family connections who invest risk capital directly to unquoted firms (Mason and Harrison 2000b). They have gained a major role in the financing of entrepreneurial start-ups and growth firms. Sohl (2003) found that the informal venture capital market is at least as large as the institutional venture capital market in the USA. While in the UK informal investors have

been found to make eight times more investments than institutional investors (Mason and Harrison 2000a). Still, estimates of the market sizes are inconsistent.[4]

Informal investors usually invest in firms that institutional investors find unattractive because of high uncertainty and small size. One reason is that they invest about 10% of their investment portfolio in unquoted firms, which allows them to make more risky investments (Mason and Harrison 1994 & Månsson and Landström 2006).

Many previous studies (Haar et al. 1988, Freear et al. 1994 and Sorheim and Landström 2001) have tried to define and divide informal investors into groups for an analysis but there is no universal definition. One definition is that entrepreneurial firms face, in their early development stages, two major resource shortages; the shortage in the financial capital resources (capital gap) and human capital resources (knowledge cap). The capital gap arises because of the reluctance of financial institutions to provide capital to risky ventures without any previous track record or collateral, while the knowledge gap arises because the entrepreneurial team often lacks necessary experience and skills (Rasila et al. 2002). The extent of the capital gap and knowledge gap for any particular company depends on the combination of several factors. According to Wright et al. (2004), capital and knowledge gaps are dependent on the complexity and the general initial resources requirements of the industry. (Avdeitchikova 2008)

Avdeitchikova (2008) separates the informal investors into four different roles based on the financial, knowledge or human capital resources. The role depend on what the firm needs. When an individual invests a large amount of financial resources into the firm, without the contribution of any

---

[4] Formal venture capital operators invest a minimum of € 2.5 million in companies, which leaves a market gap or failure in smaller amounts of equity. Individual business angels invest between 20,000- 250,000€. The average amount invested per individual in Europe is 80,000€ and up to 250,000€, depending on the business type and the region. In Europe there are about 125,000 active business angels with total available investments funds € 10-20 billion. In the USA (Freear et al. 1994) there are about 250,000 business angels and total investment funds available around $ 10-20 billion. (EBAN)

human capital resources, one can state that the investment role is capital-oriented. Alternatively, if investor is actively involved in the activities of the investment object, while the actual financial contribution is low, one can describe the investment role as knowledge-oriented. If the investor contributes a large amount of both financial and human capital resources, the investor takes a classical business angel role. Finally, if the level of contribution is low on both dimensions, it can be suggested the investor takes a micro investor role, reflecting the marginal nature of contribution. This is illustrated in figure 5. (Avdeitchikova 2008)

Figure 5. Figure presents different investment roles. (Avdeitchikova 2008)

Contribution of non-financial resources

	Low	High
High	Capital-oriented role	Classical business angel role
Low	Micro investor role	Knowledge-oriented role

Contribution of financial resources

2.2.2 Formal venture capitalist

The formal venture capital financing system involves the stages of raising funds, sourcing investments, making due diligence on potential investments, executing the investments and exiting the investments. The process is described in figure 6 and it starts when the venture capital fund manager seeks potential investors in order to raise the requisite capital for the fund. The next stage of funding process is to decide the prospect and the targets of the investment. After the investment decisions are made, the due diligence stage involves a thorough study of the targeted company carried out by the venture capitalists who assess the firms on the basis of the weighted investment criteria. If the due diligence evaluation produces a favorable result, the investment agreements would then be made. The

parties make a shareholder agreement to establish practical operating rules. Also, the monitoring process in every stage is important. Finally, the venture capitalists would consider exit strategies, which is a crucial factor of venture funding. (Wonglimpiyarat 2007)

Figure 6. Figure presents the structure of VC financing system. (Wonglimpiyarat 2007).
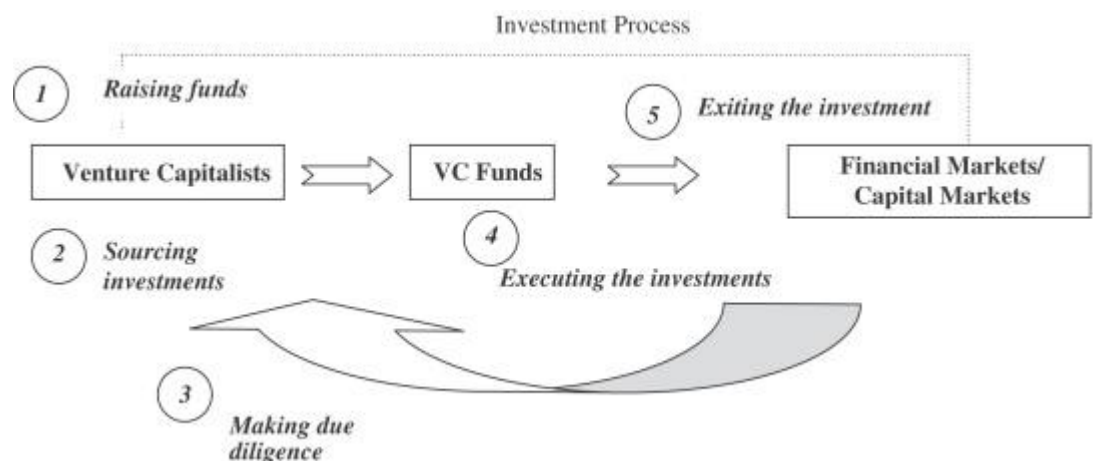
An important reason for the presence of an equity gap is the fund size of venture capitalists. SMEs equity gap is lack of funding between the starting entrepreneur in the beginning, but not yet large enough to lure the venture capitalist. This gap is often funded by business angels. Since venture capitalists manage large funds, they need to invest in larger projects if they want to monitor them efficiently. In addition, the fixed costs of project screening and monitoring make it uneconomical for the venture capitalists to make small investments. (Schwienbacher 2007)

Typical venture capitalists or a venture capital fund has a certain investment period. They try to plan the investment period up front and the funds are usually closed-end funds. There are a number of ways to terminate the financial relationship. Besides liquidation, share repurchases by the founder (buy back) and selling shares to institutional investors (secondary purchase), trade sales and IPOs are the most common methods. (Bascha and Walz 2001)
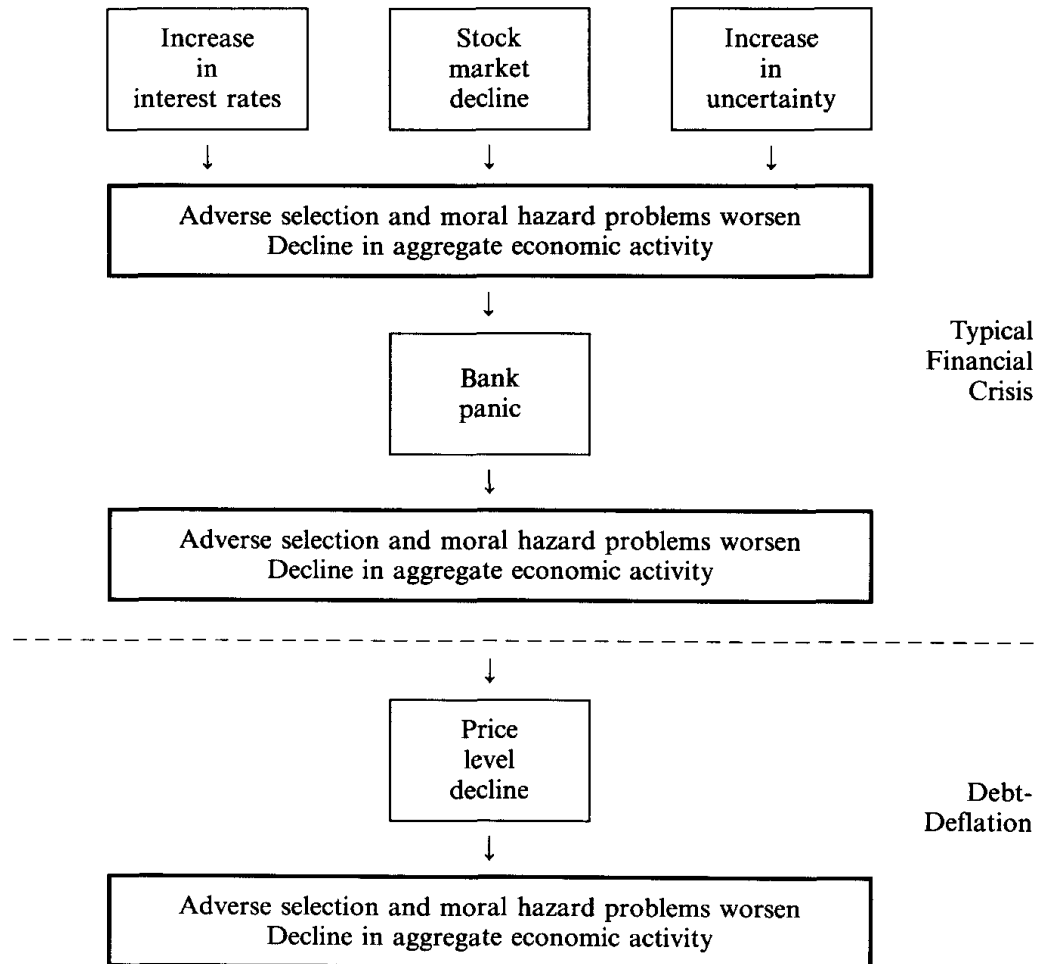
3 FINANCIAL CRISIS

Mishkin (1992) defines a financial crisis as follows: "*A financial crisis is a disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities*". Financial crisis may drive the economy away from the equilibrium with high output to one with low output. The factors causing financial crisis are: 1) increases interest rates, 2) declines in stock markets, 3) increases in uncertainty, 4) bank panics, and 5) unanticipated declines in the aggregate price level. (Mishkin 1992)

Figure 7 provides a diagrammatic exposition of the sequence of events that occur during a financial crisis. Most financial crises start because of a failure of some major financial or non-financial firm causing sharp increase in interest rates, crashing stock markets and increased uncertainty. While these problems worsen the adverse selection and moral hazard problem, it also makes the business environment less attractive for a lender to lend, which leads to a decline in investment and aggregate economic activity. Because of the worsening economic conditions, depositors start to withdraw their funds from banks in fear that banks might go bankruptcy. The result is a bank panic where interest rates rise and banks financial intermediation decreases further worsening the problems created by adverse selection and moral hazard. Finally, insolvent firms go bankruptcy, healthy firms start to recover, uncertainty starts to decline, stock markets recover and interest rates fall. Also, adverse selection and moral hazard problems will shrink, financial markets will start to improve again and the economy will recover. If, however, the crisis leads to a sharp decline in prices, the economy might recover slower causing debt-deflation. (Mishkin 1992)

Figure 7. Figure presents sequence of events in financial crisis.
(Mishkin 1992)

Increase in interest rates	Stock market decline	Increase in uncertainty

↓ ↓ ↓

Adverse selection and moral hazard problems worsen
Decline in aggregate economic activity

↓

Bank panic

Typical Financial Crisis

↓

Adverse selection and moral hazard problems worsen
Decline in aggregate economic activity

— —

↓

Price level decline

Debt-Deflation

↓

Adverse selection and moral hazard problems worsen
Decline in aggregate economic activity

The sequence of events above the dashed line are those that occur in almost all financial crises, while the events below the dashed line occur if a financial crisis develops into a debt-deflation.

According to Reinhart and Rogoff (2009) all major[5] financial crises share three common characteristics. First, asset market collapses are deep and prolonged. Second, there is deep decline in output and employment and third, the government's debts tend to rise.

The recent financial crisis started from securitization in the USA. Sub-prime mortgages are loans, which are given to home buyers with weak ability to pay the loan back with very low or zero down payment. The

[5] Meaning postwar banking crisis in the developed world; Spain 1977, Norway 1987, Finland 1991, Sweden 1991 and Japan 1992)

banks collateral for these loans was the house. After granting a number of loans, banks wrapped up the loans with credit default swaps and sold it to investors. Those mortgages were designed with a balloon interest payment implying that the mortgage would be refinanced within a short period to avoid at jump in the mortgage rate. The mortgage refinancing presupposed that house prices would continue to rise. The collapse in the housing market necessarily meant a wave of future defaults in subprime mortgages. (Udell 2009, Acharya et al. 2009)

While the sub-prime defaults were the root of the cause, the major impact which led to systemic failure was the collapse of two highly leveraged Bear Stearns –managed, hedge funds that invested in sub-prime asset-backed securities. So when the shocks lead to the burst of the asset bubble and triggered a process of deleveraging, according to Acharya et al. (2009), the following consequences happen:

"1) The fall of the value of the bubbly asset backed by high leverage leads to margin calls that force borrowers to sell the asset, which in turn starts to deflate in value.

2) This fall in the asset value now reduces the value of the collateral backing the initial leveraged credit boom.

3) Then, margin calls and the forced fire sale of the asset can drive down its price even below its now lower fundamental value, creating a cascading vicious circle of falling asset prices, margin calls, fire sales, deleveraging, and further asset price deflation."

The markets froze for months and lot of sub-prime lenders went to into bankruptcy and massive write-downs were made. Recently, the uncertainty has decreased and economy has recovered a little, but the high unemployment rate and the government's debt have been kept up the uncertainty.

4 PRODUCTIVITY MEASURES

Long-term, productivity and profitability are the most important concerns for the company. Without productivity and profitability, companies will go bankrupt. Probably at some point, all companies struggle with these issues, especially SMEs just starting out. Productivity and profitability are typically specified concepts of efficiency. The basic idea of efficiency is that the value produced is larger than the sacrifices, which can be called a surplus value.

Efficiency ratios are typically used to analyze how well a company uses its assets and liabilities internally. The ratios are usually the most meaningful when they are compared to peers in the same industry and can identify businesses that are better managed relative to others.

4.1 Return on equity

Return on equity (ROE) is the amount of net income returned as a percentage of shareholders equity. It measures a company's profitability by revealing how much profit a company generates with the money shareholders have invested.

$$(1)$$

Du Pont analysis breaks the ROE into three main components: profit margin, asset turnover and leverage factor. By breaking the ROE into distinct parts, investors can examine how effectively a company is using equity, since poorly performing components will drag down the overall figure.

$$(2)$$

$$(3)$$

$$(4)$$

A manager has basically three ways of improving operating performance in terms of ROE or ROA. First they can increase operating profit margins by controlling expenses, increase capital asset turnover by increasing asset productivity or change financial leverage by using debt capital for higher ROE as long as RoCE[6] is higher than cost of capital. Basically any decision affecting the product prices, per unit costs, volume or efficiency has an impact on the profit margin or turnover ratios. Similarly any decision effecting the amount and ratio of debt or equity used will affect the financial structure and the overall costs of capital of a company. Therefore, these financial concepts are very important to evaluate as every business is competing for limited capital resources. SMEs should understand the interrelationships among the various ratios to put their money areas where the risk adjusted return is the maximum.

4.2 Return on asset

Return on assets (ROA) is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is using its assets to generate earnings.

(5) ————

ROA explains what earnings were generated from invested capital (assets). ROA for SME and public companies can vary substantially and will be highly dependent on the industry. This is why when using ROA as a comparative measure, it is best to compare it against a company's previous ROA numbers or the ROA of a similar company.

The assets of the company are compromised of both debt and equity. Both of these types of financing are used to fund the operations of the company. The ROA figure gives investors an idea of how effectively the company is converting the money it has to invest into net income. The

---

[6] RoCE=EBIT/ total assets- current liabilities. EBIT= earnings before interest and taxes. RoCE should always be higher than the rate at which the company borrows otherwise any increase in borrowing will reduce shareholder's earnings.

higher the ROA number, the better, because the company is earning more money on less investment.

4.3 Earnings

Earnings are perhaps the single most studied number in a company's financial statements because it shows a company's profitability. A business's quarterly and annual earnings are typically compared to analyst estimates and guidance provided by the business itself. In most situations, when earnings do not meet either of those estimates, a business's stock price will tend to drop. On the other hand, when actual earnings beat estimates by a significant amount, the share price will likely surge.

Based on the pecking order theory, a firm's financial policy is guided by availability of internal finance. The most profitable companies issue debt more rarely because internally generated funds are preferred to external funds (Myers 1984). So the profitability should be negatively correlated with the short and long-term debt ratios. Chittenden et al. (1996) found that the proportion of short-term debt has a negative relationship with the profitability. The relation was negative, but not significant for the proportion of long-term debt. Profitable small firms use internal equity to finance their investments while less profitable firms has to get external equity, which is consistent with pecking order theory. They also found that for listed small firms, there is a positive relation between profitability and long-term debt ratio, but for unlisted firms the relation is negative. Also, empirical evidence from previous studies examining SMEs is consistent with pecking order arguments with leverage being found to be negatively related to profitability (Wijst and Thurik, 1993; Jordan et al., 1998; Coleman and Cohn, 1999; Mishra and McConaughy, 1999; Michaelas et al., 1999).

4.4 Growth

In the pecking order theory it is argued that growing firms place a greater demand on the internally generated funds of the firm. Thus, firms with relatively high growth will tend to look outside the firm to finance growth.

Therefore, these firms should look to short-term, less secured debt rather than long-term more secure debt for their investments. This should lead to firms with relatively higher growth having more leverage. (Cassar & Holmes 2003)

Michaelas et al. (1999) argue that future growth opportunities will be positively related to leverage, in particular short-term leverage. They argue that the agency problem and, consequentially, the costs of financing are reduced if the firm issues short-term, rather than long-term debt. It is inconsistent with Myers (1977) view who argues that conflicts between debt and equity holders are especially serious for assets that give the firm the option to undertake growth opportunities in the future. The result was firms with such growth opportunities had less debt. Michaelas et al. (1999) found future growth positively related to leverage and long-term debt, while Chittenden et al. (1996) and Jordan et al. (1998) found mixed evidence.

Younger and faster growing firms have higher levels of long-term debt. Total debt level seems to decrease with the age. Thus long-term debt was not strongly related to growth and age. The growth rate does not seem to affect the use of short-term debt, except when small unlisted rapidly growing firms have to use all sources of debt because they are incapable of raising new equity. Also, inability to get long-term financing might be connected to the use of short-term financing. (Chittenden et al. 1996)

Hall et al. (2000) and Aber & Biekpe (2009) discovered in their research that growth is positively related to the short-term debt ratio. It is expected that growth is negatively related to the short-term debt ratio and positively related to the long-term debt ratio.

Sogorb-Mira (2005) found that banks prefer to provide short-term debt to reduce risks that are related to the recovery of long-term debt. Michaelas et al. (1999) propound a positive relationship between debt and growth opportunities because SMEs mainly use short-term financing. Both Michaelas et al. (2005) and Sogorb-Mira (2005) confirmed that a firm with

more growth options has also more debt, both short and long-term. It is suggested that growth opportunities have a positive relation to the short-term debt ratio and negative to the long-term debt ratio.

4.5 Size

There are several theoretical reasons why firm size would be related to the capital structure of the firm. It is relatively more costly to the smaller firms to resolve informational asymmetries with lenders and financiers. There is less capital offered to smaller firms or the offered capital is for higher cost comparing to larger firms which discourages the use of outside financing. (Cassar & Holmes 2003)

The transaction costs associated with financing may also affect financing choices, as transaction costs are more likely a function of scale, with smaller scale financing resulting in relatively higher costs (Titman and Wessels, 1988; Wald 1999). A related issue is the marginal effects of market access for different sized firms (Scherr et al. 1993). This could be a function that some outside financing options are not available for smaller firms because of high transaction costs. Market access can also be constrained directly in that some financing options are not in the scale range that financiers would consider issuing capital. (Cassar & Holmes 2003)

Chittenden et al. (1996) noticed that Modigliani and Miller (1958 & 1963) did not cite in their proportions that size or state of development would be a determinant to the capital structure and, therefore they should not have an effect on leverage ratio. This would be coherent with the market efficiency. It is widely recognized that small firms are not a scaled-down version of large firms. The large firms tolerate high debt ratios better because they tend to be more diversified and thus have a lower variance of earnings (Titman and Wessels 1988). Also, the bankruptcy cost for large firms are relatively smaller than for small firms (Abor & Biekpe 2009).

Nguyen & Ramachandran (2006) found that the positive relationship with size and debt ratio supports the asymmetric information existence

because small firms more likely run into the agency problems between owners and potential lenders. Sogorb-Mira (2005) and Abor & Biekpe (2009) found that the size is positively related to debt, not only for large firms, but also for smaller firms. A positive connection between the size and long-term debt is expected, whereas the size should be negatively related to short-term debt.

4.6 Age

The age of the firm is used as a standard measure of reputation in the capital structure models. Over time, the firm builds trust for itself as a stable player in business and therefore increases its capacity to take on more debt. From the beginning a firm has to grow a reputation, which is evaluated by the market. The reputation proofs the firm's ability to meet obligations on time. Younger firms are subject to more agency costs and they are usually financed by short-term debt. Older firms have built their reputation and have more long-term debt. (Abor & Biekpe 2009). They can adjust short and long-term debt to fit the firm's situation as well as take care of the tax shield.

New firms have not had time to retain cash flow so they are forced to borrow (Hall et al. 2004). Hence, age should be negatively related to the proportion of debt, which is consistent with the pecking order theory. However, it is found that the age of a firm has a positive connection to long-term debt, but a negative relation on both long and short-term debt. Chittenden et al. (1996) found that younger firms rely on short-term finance. For long-term financing a negative connection was not significant. According to the agency theory, a negative connection between age and short-term debt ratio is expected to be found.

4.7 Equity ratio

A low equity ratio generally means that a company has been aggressive in financing its growth with debt. If a large amount of debt is used to finance an increase in investments, the company could potentially generate more earnings than it would have without outside financing. This grows the risks

related to the company. Equity ratios also vary greatly between different industries.

According to Petersen and Rajan (1994), leverage increases with size, but decreases with age. They think the natural explanation for this observation would be that young firms tend to be externally financed while older tend to accumulate retained earnings. Also Rajan and Zingales (1995) find strong negative relationships between debt ratios and past profitability.

According to Abor (2008), agency conflicts may be largely responsible for the excessive use of debt by SMEs, leading to a negative relationship between capital structure and financial performance. Hutchinson (1995) argues that in more general terms, financial leverage has a positive effect on the firm's return on equity provided that earnings' power of the firm's assets exceeds the average interest cost of debt to the firm. He argues that the extent to which a firm's earnings' power is likely to remain above the breakeven point and the potential speed or flexibility with which it can adjust its debt usage, if its earnings' power falls below average interest costs, should help to determine the level of debt that the firm is willing to commit itself to at a given point in time.

Fama and French (1998) argue that the use of excessive debt creates agency problems among shareholders and creditors and that could result in negative relationship between leverage and profitability. Majumdar and Chhibber (1999) found in their Indian study that leverage has a negative effect on performance, while Krishnan and Moyer (1997) connect capital and performance to the country of origin. Gleason et al. (2000) support a negative impact of leverage on the profitability of the firm.

5 RESEARCH DATA AND METHODOLOGY

5.1 Data and source

The data used in this thesis consist of financial statement data and the results of a corporate questionnaire. The questionnaire was made by the Lappeenranta School of Business' department of accounting and finance and the Hanken School of Economics in 2009-2010. The questionnaire consists of 63 questions answered by 860 corporations. In this study 807 corporate answers were used because only those answers include all the needed information for this study. The questionnaire results were combined with financial statement data. The questionnaire questions used in this study was related to the venture capitalists and are attached in the appendixes. All 807 firms in the questionnaire are used in the regression analysis.

5.2 Models and variables

The testable models and variables, for the most part, are formed based on the previous studies of SMEs by Cassar & Holmes (2003) and Michaelas et al. (1999). First, the construction of the variables of these models is explained. Second, the formulation of testable models is presented.

In this study, the models are estimated using regression analysis and the straightforward ordinary least squares method. The models are tested with the Eviews 6.1 program. Multiple regression models can be presented as follows:

(6)

$F_{i,t}$ represents the explanatory variables for firm i in year t. N is the number of observations and u is the error term of the model, which represents factors other than x that affect y. Constant (α) and beta (β) values are estimated by using different models. Constant (α) is the intercept and (β) values measures the change in Y with respect to F's, holding other factors fixed.

The testable variables are presented in the previous chapter. These variables were taken directly from the survey data.

Variables in all models are size, return on asset, return on equity and growth. These variables are based on Cassar & Holmes (2003) research. Also, variables age and equity ratio is added to the test, which was also tested by Michaelas et al. (1999). The data has been divided into two groups in the regression analysis; the first group is the firms without venture capitalists and the second one is with the venture capitalists.

In this study, 13 regression models are formulated to find out the effects of different variables. By dividing the data into two groups it is intended to discover the effects of different variables on the changing dependent variable. The purpose of each model is to try to find out the different effects on SMEs with and without venture capitalists. By using this method of analysis, it is possible to find out the effect of venture capitalists on SMEs.

The first two models are related to the agency theory. Smaller firms don't have a large amount of public information available, which might cause problems from the point of view of venture capitalists. Size is also an interesting variable because Esperança et al. (2003) found that size is the most significant determinant in regards to access to financing. Cassar and Holmes (2003) argue that outside financing costs are greater for smaller firms, which is the reason why they prefer inside financing. It is interesting to see whether the affects of the venture capitalists are consistent with previous studies.

(7)[7]

(8)

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[7] (log)size= natural logarithm of assets size from balance sheet, ROE= return on equity, ROA= return on assets, Growth= % change in sales, Age= age of the firm and ER=equity ratio.

Models 9, 10, 11 and 12 include variables that are related to pecking order theory. Like in the previous models, the same variables are used, but in different order. Profitability is often the most important measure of a business. For examples of previous studies emphasizing profitability, see Chittenden et al. (1996), Michaelas et al. (1999) and Esperança et al. (2003). Cassar and Holmes (2003) found that firms which generate inside financing don't often need outside financing, which means they don't need venture capitalists.

(9)

(10)

(11)

(12)

Models 13 and 14 are related to the pecking order theory and the agency theory. Growing firms need financing for the growth so they have to get either inside or outside financing. If they decided to get outside financing, the agency problem comes into picture. Also, growth variable is tested by Cassar and Holmes (2003) and past growth is tested by Michaelas et al. (1999). Cassar and Homes (2003) found that firms using outside financing grow relatively more than firms only using inside financing.

(13)

(14)

Models 15 and 16 are related to the pecking order theory and the static tradeoff theory. Usually age gives a firm credibility in meeting its obligations, especially financial obligations. It is more common that younger firms use venture capitalists because older firms have already gained internal financing and stability in their business. Michaelas et al. (1999) also studied the age variable in their research and suggest that age is negatively related to gearing.

(15)

(16)

Models 17 and 18 are related to the agency theory. The equity ratio indicates how the firm is financing its operations. SMEs tend to have a lower equity ratio than bigger firms because they usually don't have stable internal returns and they are looking for growth. Venture capitalists are interested in SMEs because of potential high returns which have an effect on the equity ratio. Also, Abor (2008) used debt ratio in his research and found that firms with lower levels of internal financing need more debt.

(17)

 (18)

In the last regression, the goal was to view the full impact of different variables to the venture capitalist. It is interesting to see how these different variables affect the firms and which variable indicates whether the firm has venture capitalists or not. There aren't previous studies like this, which is a shame because venture capitalists are a crucial part in business and especially to SME firms.

(19)

The residuals and error term from the regression models should follow the normal distribution with zero mean and variance:

The Jarque-Bera test is used for to test the normality of the regression models. Usually, if the Jarque-Bera value is smaller than 0.05, the hypothesis of the normality must be rejected, but if the sample is big enough, the non-normality of residuals is not a problem.

The Durbin-Watson test is used to test the autocorrelation of residuals. If the Durbin-Watson value is 2, there is no autocorrelation. If the value is 0, there is a positive autocorrelation and if the value is 4, there is a negative autocorrelation.

6 RESULTS

The results of the study are presented in this section. First, the sample statistics are presented. Then the results of previously presented regression models are formed and analyzed according to the objectives of this study.

6.1 Sample statistics

Table 3a. Descriptive summary of statistics

Variable	Mean	Median	Maximum	Minimum	Std.Dev.
SIZE (Total assets 1000€)	5,586	1803	97,681	14	11,041
ROE	23.38	18.60	176.40	-96.80	28.34
ROA	15.39	13.50	100.40	-60.90	16.75
GROWTH	14.16	7.90	777.80	-96.00	47.41
AGE	3.81	4.00	4.00	1.00	0.48
ER	42.14	41.60	99.80	-84.30	28.83

Descriptive summary statistics, the table presents mean, median, maximum and minimum values and standard deviations of the variables. Growth means percentage change in sales. Age value 1 means firm age is under 1 year old, 2 means 1-5 years, 3 means 6-10 years and 4 means that firm is over 10 years old.

Table 3a presents means, medians, maximum and minimum values and standard deviations for the variables used in this study. It can be seen from the table that the mean for return on equity is 23.38 % and for return on asset it is 15.39 %. Comparing these values to the median values which are slightly lower, 18.60 % and 13.50 % respectively. Mean for age variable is 3.81 % which indicates that most of the firms in this sample are over 10 years old. Equity ratio mean value is 42.14 and median is 41.60, which indicates that firms are using more outside financing than internal returns.

Table 3b. Descriptive summary of statistics

Variable	Skewness	Kurtosis	Jarque- Bera probability	Observations
SIZE(Total assets 1,000€)	4.130	23.398	< 0.001	807
ROE	1.164	7.477	< 0.001	807
ROA	0.679	6.002	< 0.001	807
GROWTH	8.057	108.094	< 0.001	807
AGE	-2.683	9.717	< 0.001	806
ER	-0.473	3.816	< 0.001	807

The table 3b shows skewness, kurtosis, Jarque- Bera probability and number of observations.

Table 3b shows skewness, kurtosis, Jarque- Bera probabilities and the number of observations of the variables used in this study. The Jarque-Bera value measures whether observations follow the normal distribution. The Jarque- Bera probability is lower than 0.1% in every variable which means that the normality default is rejected.

Table 4. Correlation table for studied variables

Variable	Venture capitalist	SIZE	ROE	ROA	GROWTH	AGE	ER
Venture capitalist	**1.000**	0.112	0.044	0.025	0.036	-0.156	-0.125
SIZE	0.112	**1.000**	-0.027	-0.043	-0.016	0.099	0.034
ROE	0.044	-0.027	**1.000**	0.899	0.152	-0.044	0.188
ROA	0.025	-0.043	0.899	**1.000**	0.080	-0.011	0.334
GROWTH	0.036	-0.016	0.152	0.080	**1.000**	-0.217	-0.145
AGE	-0.156	0.099	-0.044	-0.011	-0.217	**1.000**	0.203
ER	-0.125	0.034	0.188	0.334	-0.145	0.203	**1.000**

Table 4 presents the correlations between studied variables.

Table 4 shows the correlations matrix for the studied variables. As can be seen from the table, variable size seems to correlate the most with the venture capitalist variable as age seems to have negative correlations with

venture capitalist. Size seems to have negative correlations with variables ROE, ROA and growth. Return on equity and growth have surprisingly high correlation compared to the correlation between return on asset and growth. Also, age is correlated negatively with all of the variables except size and equity ratio seems to have a strong positive correlation with return on asset and age, which is expected.

6.2 Regression results

In this section, the results of the regression analysis are analyzed. The R-squared and adjusted R-squared values for the regression models are also presented. R-squared can be defined as

$$\overline{\quad\quad}\quad\quad\overline{\quad\quad}$$

R-squared is interpreted as the proportion of the sample variation in y_i that is explained by the regression line (Wooldridge 2002, 79).

Table 5. Results of regression model 7 where firms are without venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	**5.490120**	**0.427603**	**12.83930**	**0.0000**
ROA	-0.009986	0.007319	-1.364344	0.1729
ROE	0.002888	0.004260	0.677982	0.4980
GROWTH*	**0.003066**	**0.001065**	**2.879100**	**0.0041**
AGE*	**0.462303**	**0.110670**	**4.177296**	**0.0000**
ER*	**0.008309**	**0.001936**	**4.292632**	**0.0000**

R-squared	0.057746	Mean dependent var		7.578510
Adjusted R-squared	0.051354	S.D. dependent var		1.350545
S.E. of regression	1.315411	Akaike info criterion		3.394218
Sum squared resid	1,275.235	Schwarz criterion		3.431451
Log likelihood	-1,254.952	F-statistic		9.033405
Durbin-Watson stat	1.940398	Prob(F-statistic)		0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is size. The model sample size is 807 and there were 743 observations, which are the firms without venture capitalists.

The table 5 presents the results of regression model 7, which is related to the agency theory. In this regression model there are firms without venture capitalists. The R-squared of the regression model is 0.058 and the adjusted R-squared is 0.051. The adjusted R-squared measures the proportion of the variation in the dependent variable taking into account the loss of degrees in freedom associated with adding extra variables. The primary attractiveness of adjusted R-square is that it imposes a penalty for adding additional independent variables to a model. R-squared can never fall when a new independent variable is added to a regression because the sum of squared residuals never goes up as more independent variables are added. (Wooldridge 2002, 192-193)

When measuring independent variables to the dependent variable size; growth, age and equity ratio are all positive and statistically significant at the 5% risk level. It is expected that when SMEs are getting older they are growing bigger with internal financing improving their equity ratio. As can be seen from the table 5, the Durbin-Watson value is close to 2 which indicate that in this regression analysis there is not autocorrelation.

Table 6. Results of regression model 8 where firms have venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	**6.800490**	**1.018777**	**6.675148**	**0.0000**
ROA*	**-0.054462**	**0.028972**	**-1.879811**	**0.0652**
ROE*	**0.024488**	**0.013182**	**1.857648**	**0.0684**
GROWTH	5.70E-05	0.004546	0.012542	0.9900
AGE	0.215497	0.286576	0.751971	0.4552
ER*	**0.025563**	**0.006951**	**3.677481**	**0.0005**

R-squared	0.249974	Mean dependent var	8.090470
Adjusted R-squared	0.184182	S.D. dependent var	1.632006
S.E. of regression	1.474071	Akaike info criterion	3.704326
Sum squared resid	123.8544	Schwarz criterion	3.908434
Log likelihood	-110.6863	F-statistic	3.799477
Durbin-Watson stat	3.964300	Prob(F-statistic)	0.004869

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is size. The model sample size is 807 and there were 63 observations, which are the firms with venture capitalists.

Table 6 reports the results of regression model 8, which are the SMEs with venture capitalists. The R-square is 0.249, which is quite high, and the adjusted R-square is 0.184. The results show in the table 6 that equity ratio is statistically significant at the 5% risk level, but when expanding the risk level to 10%, return on asset and return on equity become statistically significant. Also, it can be seen from the table 6 that the autocorrelation is negative.

The results in the tables 5 and 6 are inconsistent between SMEs with or without venture capitalists when measuring the size as a dependent variable. In both regression analyses equity ratio seems to have a positive effect on size and it is statistically significant at the 5 % risk level. The results are also inconsistent with previous studies. Nguyen &

Ramachandran (2006), Sogorb-Mira (2005) and Abor & Biekpe (2009) found a positive relationship with size and long-term debt ratio.

When comparing these results in the tables 5 and 6, it seems like the firms with venture capitalists have survived the financial crisis a little better. The firms with venture capitalists have better rates for return on equity and equity ratio when measuring those to the size.

Table 7. Results of regression model 9 where firms are without venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.711808	2.375434	1.141605	0.2540
ROE***	**0.527814**	**0.008988**	**58.72304**	**0.0000**
GROWTH	-0.004694	0.005381	-0.872401	0.3833
AGE	-0.514916	0.562496	-0.915413	0.3603
ER***	**0.100872**	**0.009122**	**11.05774**	**0.0000**
SIZE	-0.252288	0.184915	-1.364344	0.1729
R-squared	0.846905	Mean dependent var		15.29852
Adjusted R-squared	0.845866	S.D. dependent var		16.84092
S.E. of regression	6.611722	Akaike info criterion		6.623608
Sum squared resid	32217.86	Schwarz criterion		6.660841
Log likelihood	-2,454.670	F-statistic		815.4010
Durbin-Watson stat	2.124805	Prob(F-statistic)		0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is return on asset. The model sample size is 807 and there were 743 observations, which are the firms without venture capitalists.

Table 7 presents the results of regression model 9, which is related to the pecking order theory. In this regression model, the firms are without venture capitalists. The results show that the R-square and adjusted R-square are extremely high, 0.847 and 0.846 respectively. These high levels are mostly caused by the independent variable return on equity, which has high correlation with the dependent variable. Equity ratio has a

strong positive effect on return on asset and it is also statistically very significant. The result in table 7 shows a negative relationship with age, which is not statistically significant. Nevertheless, the negative relationship is still surprising because a positive relationship would be expected between age and return on asset. The Durbin-Watson value is slightly above 2, which indicates that there is no autocorrelation.

Table 8. Results of regression model 10 where firms have venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.065456	5.937508	1.358391	0.1797
ROE*	**0.397524**	**0.029235**	**13.59767**	**0.0000**
GROWTH*	**-0.047165**	**0.019174**	**-2.459888**	**0.0170**
AGE	0.952697	1.271389	0.749335	0.4567
ER*	**0.134052**	**0.029348**	**4.567615**	**0.0000**
SIZE*	**-1.071865**	**0.570198**	**-1.879811**	**0.0652**
R-squared	0.835120	Mean dependent var		16.84286
Adjusted R-squared	0.820657	S.D. dependent var		15.44189
S.E. of regression	6.539472	Akaike info criterion		6.683983
Sum squared resid	2,437.587	Schwarz criterion		6.888091
Log likelihood	-204.5455	F-statistic		57.74122
Durbin-Watson stat	1.847022	Prob(F-statistic)		0.000000

Statistical significance of the variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is return on asset. The model sample size is 807 and there were 63 observations, which are the firms with venture capitalists.

Table 8 reports the results of regression model 10 where the firms have venture capitalists. The R-square and adjusted R-square are high, at 0.835 and 0.820 respectively. The independent variables return on equity, growth and equity ratio are statistically significant at the 5% risk level. The independent variable size is statistically significant at the 10% risk level. The result of the table shows that variable age has a positive effect to the return on asset, although it is not statistically significant. The Durbin-

Watson value is slightly lower than 2, which indicates that there is not autocorrelation in this regression model.

Table 9. Results of regression model 11 where firms are without venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.638171	4.088261	0.400701	0.6888
GROWTH**	**0.023461**	**0.009217**	**2.545300**	**0.0111**
AGE	0.186657	0.967864	0.192854	0.8471
ER***	**-0.118451**	**0.016368**	**-7.236910**	**0.0000**
SIZE	0.215805	0.318305	0.677982	0.4980
ROA***	**1.560988**	**0.026582**	**58.72304**	**0.0000**
R-squared	0.835329	Mean dependent var		23.07079
Adjusted R-squared	0.834212	S.D. dependent var		27.92527
S.E. of regression	11.37035	Akaike info criterion		7.707938
Sum squared resid	95,282.96	Schwarz criterion		7.745171
Log likelihood	-2,857.499	F-statistic		747.7191
Durbin-Watson stat	2.079527	Prob(F-statistic)		0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is return on equity. The model sample size is 807 and there were 743 observations, which are the firms without venture capitalists.

Table 9 reports the results of regression model 11, which is related to the pecking order theory. In this regression model, the firms are without venture capitalists. The R-square and adjusted R-square are high due to the correlation between the independent variable return on asset and dependent variable return on equity, 0.835 and 0.834 respectively. The independent variables growth, equity ratio and return on asset are statistically significant at the 5% risk level. All the independent variables, except the equity ratio, have a positive effect to the dependent variable return on asset. The regression model does not have autocorrelation as can be seen from the Durbin-Watson value, which is 2.

Table 10. Results of regression model 12 where firms have venture
capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-18.68190	13.03530	-1.433178	0.1573
GROWTH*	**0.150040**	**0.039649**	**3.784170**	**0.0004**
AGE	-0.555709	2.808950	-0.197835	0.8439
ER*	**-0.197660**	**0.070750**	**-2.793766**	**0.0071**
SIZE*	**2.331162**	**1.254900**	**1.857648**	**0.0684**
ROA*	**1.922806**	**0.141407**	**13.59767**	**0.0000**
R-squared	0.820880	Mean dependent var		27.70000
Adjusted R-squared	0.805168	S.D. dependent var		32.58356
S.E. of regression	14.38231	Akaike info criterion		8.260267
Sum squared resid	11,790.49	Schwarz criterion		8.464376
Log likelihood	-254.1984	F-statistic		52.24458
Durbin-Watson stat	3.167082	Prob(F-statistic)		0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is return on equity. The model sample size is 807 and there were 63 observations, which are the firms with venture capitalists.

Table 10 reports the results of regression model 12 where the firms have venture capitalists. The R-square and adjusted R-square are high, at 0.821 and 0.805 respectively. The independent variables growth, equity ratio and return on asset are statistically significant at the 5% risk level. The independent variable size is statistically significant at the 10 % risk level. The Durbin-Watson value is slightly over 3, which indicates that the regression model has a weak negative autocorrelation.

Previous studies have found that profitable firms which have access to retained profits can use these profits for firm financing rather than accessing outside sources. Also, more profitable firms would be more likely to get access to outside capital, but these firms will prefer inside funds to finance their operations and investments. Empirical evidence from previous studies examining SMEs are consistent with pecking order arguments with leverage being found to be negatively related to

profitability (Chittenden et al., 1996; Coleman and Cohn, 1999 and Michaelas et al., 1999).

The results in this study in tables 7, 8, 9 and 10 offer mixed evidence on the variables which affect the profitability. Independent variable size has negative effect on the return on asset but positive effect on the return on equity. This might be caused by a firm's leverage, which has an effect on the return on asset. Nevertheless, the results are somewhat consistent with the previous studies. Also, from the financial crisis point of view, the results of this study are slightly inconsistent with the previous studies. The results show in tables 7 and 8 that firms with venture capitalists have a better effect on the equity ratio but the firms without venture capitalists have a better effect of the return of equity. However, the results in tables 9 and 10 are exactly opposite when comparing the same variables. These tables show that the results of the profitability variables are mixed.

Table 11. Results of regression model 13 where firms are without venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C***	**67.18438**	**16.07887**	**4.178427**	**0.0000**
AGE***	**-19.57019**	**3.782976**	**-5.173225**	**0.0000**
ER***	**-0.257054**	**0.066730**	**-3.852164**	**0.0001**
SIZE***	**3.627108**	**1.259806**	**2.879100**	**0.0041**
ROA	-0.219772	0.251916	-0.872401	0.3833
ROE**	**0.371414**	**0.145922**	**2.545300**	**0.0111**

R-squared	0.090165	Mean dependent var	13.69852
Adjusted R-squared	0.083992	S.D. dependent var	47.26918
S.E. of regression	45.24052	Akaike info criterion	10.46991
Sum squared resid	1,508,421	Schwarz criterion	10.50714
Log likelihood	-3883.570	F-statistic	14.60736
Durbin-Watson stat	1.284953	Prob(F-statistic)	0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is growth. The model sample size is 807 and there were 743 observations, which are the firms without venture capitalists.

Table 11 reports the results of regression model 13, which is related to pecking order theory and agency theory. This table represents firms without venture capitalists. The R-square of the model is 0.090 and the adjusted R-square is 0.084. Variables age, equity ratio, size and return on equity are statistically significant at the 5% risk level. Variables age and size seem to have the biggest impact to growth, which is expected. The Durbin-Watson value is slightly over 1, which indicates that the regression model has a weak positive autocorrelation.

Table 12. Results of regression model 14 where firms have venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	**72.41836**	**38.44634**	**1.883622**	**0.0647**
AGE**	**-17.03855**	**8.082587**	**-2.108057**	**0.0394**
ER	0.167014	0.224209	0.744906	0.4594
SIZE	0.048406	3.859504	0.012542	0.9900
ROA**	**-2.034766**	**0.827178**	**-2.459888**	**0.0170**
ROE***	**1.338210**	**0.353634**	**3.784170**	**0.0004**
R-squared	0.301800	Mean dependent var		20.00159
Adjusted R-squared	0.240554	S.D. dependent var		49.28779
S.E. of regression	42.95244	Akaike info criterion		10.44846
Sum squared resid	105,160	Schwarz criterion		10.65256
Log likelihood	-323.1264	F-statistic		4.927690
Durbin-Watson stat	0.831091	Prob(F-statistic)		0.000812

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is growth. The model sample size is 807 and there were 63 observations, which are the firms with venture capitalists.

Table 12 presents the results of regression model 14, which is related to pecking order theory and agency theory. This table represents firms with venture capitalists. The R-square of the model is 0.302 and the adjusted R-square is 0.241. Variables age, return on asset and return on equity are statistically significant at the 5% risk level. Also, variable age has a huge

impact on the dependent variable. The Durbin-Watson value is slightly below 1, which indicates a positive autocorrelation in the regression model.

The results in the tables 11 and 12 show that the effect of equity ratio to dependent variable growth is positive in the firms with venture capitalists and negative in the firms without venture capitalists. So the firms with venture capitalists are growing with internal financing and firms without venture capitalists use debt to grow. This is consistent with pecking order theory and the previous study by Cassar & Holmes (2003). Also Chittenden et al. (1996) argue that growth seems to fall with age, which is consistent with this study. The results in this study offer mixed effects when comparing the firms' survival in the financial crisis. The firms without venture capitalists seem to have less variation in the results. Some of the firms with venture capitalists have survived well from the financial crisis, but some firms are in trouble with decreased return on asset.

Table 13. Results of regression model 15 where firms are without venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C***	3.404968	0.092099	36.97074	0.0000
ER***	0.002399	0.000639	3.756548	0.0002
SIZE***	0.050030	0.011977	4.177296	0.0000
ROA	-0.002206	0.002409	-0.915413	0.3603
ROE	0.000270	0.001402	0.192854	0.8471
GROWTH***	-0.001790	0.000346	-5.173225	0.0000
R-squared	0.091874	Mean dependent var		3.835801
Adjusted R-squared	0.085713	S.D. dependent var		0.452557
S.E. of regression	0.432728	Akaike info criterion		1.170627
Sum squared resid	138.0058	Schwarz criterion		1.207860
Log likelihood	-428.8881	F-statistic		14.91231
Durbin-Watson stat	1.213177	Prob(F-statistic)		0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is age. The model sample size is 807 and there were 743 observations, which are the firms without venture capitalists.

Table 13 presents the results of regression model 15. The regression model is related to the pecking order theory and the static tradeoff theory. In this table there are firms without venture capitalist. The R-square and adjusted R-square are 0.092 and 0.086 respectively. The variables equity ratio, size and growth are statistically significant at the 5% risk level. Although the affects to the dependent variable aren't huge, it can be seen that the biggest affect comes from size variable. The Durbin-Watson value is slightly over 1, which indicates that the regression model has a weak positive autocorrelation.

Table 14. Results of regression model 16 where firms have venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	**3.060188**	**0.476306**	**6.424841**	**0.0000**
ER	0.002458	0.003541	0.694108	0.4904
SIZE	0.045583	0.060618	0.751971	0.4552
ROA	0.010239	0.013664	0.749335	0.4567
ROE	-0.001235	0.006241	-0.197835	0.8439
GROWTH**	**-0.004245**	**0.002014**	**-2.108057**	**0.0394**
R-squared	0.169776	Mean dependent var		3.555556
Adjusted R-squared	0.096950	S.D. dependent var		0.713415
S.E. of regression	0.677951	Akaike info criterion		2.150908
Sum squared resid	26.19817	Schwarz criterion		2.355016
Log likelihood	-61.75360	F-statistic		2.331239
Durbin-Watson stat	2.392466	Prob(F-statistic)		0.053866

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is age. The model sample size is 807 and there were 63 observations, which are the firms with venture capitalists.

Table 14 presents the results of regression model 16. The regression model is related to the pecking order theory and the static tradeoff theory. In this table there are firms with venture capitalist. The R-square and adjusted R-square are 0.170 and 0.097 respectively. The variable growth

is statistically significant at the 5% risk level. The biggest affect to the dependent variable age is with size variable. The Durbin-Watson value is over 2, which indicates that the regression model has a weak negative autocorrelation.

Previous studies (Abor & Biekpe 2009 and Chittenden et al. 1996) argue that the age is negatively related to the proportion of debt which is consistent with the pecking order theory. Also, according to the agency theory a negative connection between age and debt ratio is expected to be found. Both of these are consistent with this study. In this study the dependent variable age seems to have a similar affect to the firms with or without venture capitalists which is expected. The results in the tables 13 and 14 show that SMEs with or without venture capitalists have survived from the financial crisis with similar effects.

Table 15. Results of regression model 17 where firms are without venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	-16.66391	8.869929	-1.878697	0.0607
SIZE***	2.935700	0.683893	4.292632	0.0000
ROA***	1.410690	0.127575	11.05774	0.0000
ROE***	-0.560123	0.077398	-7.236910	0.0000
GROWTH***	-0.076782	0.019932	-3.852164	0.0001
AGE***	7.831903	2.084867	3.756548	0.0002
R-squared	0.236789	Mean dependent var		43.23311
Adjusted R-squared	0.231611	S.D. dependent var		28.20688
S.E. of regression	24.72552	Akaike info criterion		9.261592
Sum squared resid	450,566	Schwarz criterion		9.298825
Log likelihood	-3,434.681	F-statistic		45.73146
Durbin-Watson stat	1.894026	Prob(F-statistic)		0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is equity ratio. The model sample size is 807 and there were 743 observations, which are the firms without venture capitalists.

Table 15 presents the results of regression model 17. The regression model is related to the agency theory. In this table, there are firms without venture capitalists. The R-square is 0.237 and the adjusted R-square is 0.232. All of the independent variables in the regression model are statistically very significant at the 1% risk level. The variable age seems to have the biggest effect on the dependent variable, which is expected because equity ratio should improve from the firm's early years. The Durbin-Watson value is slightly below 2, which indicates that the regression model has no autocorrelation or weak positive autocorrelation.

Table 16. Results of regression model 18 where firms have venture capitalists.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C***	**-60.96521**	**21.85131**	**-2.790003**	**0.0072**
SIZE***	**7.501680**	**2.039896**	**3.677481**	**0.0005**
ROA***	**1.998828**	**0.437609**	**4.567615**	**0.0000**
ROE***	**-0.609328**	**0.218103**	**-2.793766**	**0.0071**
GROWTH	0.057725	0.077494	0.744906	0.4594
AGE	3.410033	4.912826	0.694108	0.4904
R-squared	0.468493	Mean dependent var		29.79365
Adjusted R-squared	0.421870	S.D. dependent var		33.21098
S.E. of regression	25.25193	Akaike info criterion		9.386075
Sum squared resid	36,346.61	Schwarz criterion		9.590183
Log likelihood	-289.6614	F-statistic		10.04846
Durbin-Watson stat	2.205182	Prob(F-statistic)		0.000001

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is equity ratio. The model sample size is 807 and there were 63 observations, which are the firms with venture capitalists.

Table 16 presents the results of regression model 18. The regression model is related the agency theory. In this table, there are firms with venture capitalists. The R-square is 0.469 and the adjusted R-square is 0.422. The variables size, return on asset and return on equity are statistically significant. The Durbin-Watson value is slightly above 2, which

indicates that the regression model has no autocorrelation or at least weak negative autocorrelation.

As can be seen from tables 15 and 16, the variables size and age seem to have the biggest effect on the dependent variable equity ratio, which is expected. The results in these tables show mixed effects between whether firm has a venture capitalists or not. Variable age seems to have bigger affect on firms without venture capitalists while firms with venture capitalists have a bigger effect on the variable size. According to Petersen and Rajan (1994), leverage decreases with age, which is consistent with this study. In the financial crisis point of view, the firms without venture capitalists have survived the financial crisis better than the firms with venture capitalists. For the firms without venture capitalists, the constant value is -16.6 and for the firms with venture capitalists the constant value is -60.9, which indicates that when comparing these two types of firms in equity ratio the firms without venture capitalists have done much better.

Table 17. Results of regression model 19 with all the studied firms.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C***	0.225996	0.086155	2.623137	0.0089
SIZE***	0.028784	0.006882	4.182242	0.0000
ROA	0.001050	0.001371	0.765787	0.4440
ROE	8.83E-05	0.000782	0.112954	0.9101
GROWTH	-0.000189	0.000205	-0.923100	0.3562
AGE***	-0.085144	0.020068	-4.242834	0.0000
ER***	-0.001374	0.000368	-3.737191	0.0002
R-squared	0.057903	Mean dependent var		0.078164
Adjusted R-squared	0.050828	S.D. dependent var		0.268596
S.E. of regression	0.261681	Akaike info criterion		0.165263
Sum squared resid	54.71295	Schwarz criterion		0.206013
Log likelihood	-59.60115	F-statistic		8.184617
Durbin-Watson stat	2.023505	Prob(F-statistic)		0.000000

Statistical significance of variables is presented at the 0.01 level ***; 0.05 ** and 0.10 *. In this regression model, the dependent variable is Q9. The model sample size is 807 and there were 806 observations, which are all the firms.

Table 17 presents the results of regression model 19. The variables size and age have the biggest effect to the dependent variable and are statistically significant at the 5% risk level. Also, equity ratio is statistically significant at the same level. It is expected that size and age have the biggest effect whether the firm has venture capitalists or not. If a firm is small, it is more likely that venture capitalists are involved, but when a firm is growing and years go by, the venture capitalists usually sell their shares and leave the company. The R-square of the model is 0.058 and adjusted R-square is 0.051. The Durbin-Watson value is 2, which indicates that there is no autocorrelation in this regression model.

Table 18. Reports the result of question 18.

	All	VC
Financial crisis decrease companies sales	3.27	3.28
Financial crisis decrease companies profitability	3.24	3.25
Lack of financing compromising future of the company	2.18	2.18
Financial crisis increase the risk of bankruptcy	1.91	1.91
Overall the financial crisis interfere the company business	3.12	3.12

The question for table 18 is how much followed arguments have effect on the company during financial crisis? Answer: 1=little, 5= much. The numbers presented are averages.

Table 18 presents the companies' own estimates of the effects of the ongoing financial crisis. The results show that the companies which have venture capitalist funding are estimating the financial crisis to have more negative effect on their existence. The companies without venture capitalists seem to have a little bit brighter estimate on effects of the financial crisis. Still it would be expected to have more variation in the results. Overall, table 18 presents that firms believe the financial crisis will have a negative effect on the companies, especially on the company's sales and profitability.

6.3 Summary of the regression results

In summarizing the results from tables 5-17, it can be seen that, overall, venture capitalists have a positive effect on SMEs and firms with venture capitalists can survive better in a financial crisis. For example, when comparing tables 15 and 16 where the dependent variable is equity ratio, the firms with venture capitalist get better results in the size variable[8]. This indicates that firms with venture capitalists are gaining a much better result in equity ratio when the firm is growing bigger.

Although the results are somewhat mixed, there are still more positive effects in the firms with venture capitalists. Generally, SMEs with venture capitalists have better results in most of the tested variables. It is expected that SMEs with venture capitalists have better results in profitability and equity ratios, which is consistent with this study. Also, it can be seen from the results that venture capitalists effect positively on the capital structure and other company determinants.

As can be seen from tables 5-18, the results are mixed between the companies' own estimates and financial statements. Although the differences between firms with or without venture capitalists are small, it is remarkable to see that SMEs should use venture capitalists to survive better in a financial crisis and in the future.

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[8] Firms without venture capitalists the coefficient is 2.94 and firms with venture capitalists the coefficient is 7.50.

7 CONCLUSIONS

In this thesis, a venture capitalist investment on Finnish small and medium size companies is studied. The specific objective of the thesis has been to determine the effect of the venture capitalists on SMEs. In addition, the effect of the financial crisis has also been studied. The theories effecting SME investment have been presented to provide background information.

SMEs and venture capitalists are crucial parts of the economy worldwide including in Finland. It is important to provide a variety of results from different views on these subjects to better understand them. The world is changing constantly so it is important to study it constantly. Now it is crucial to learn more about the current financial crisis and provide solid information about the financial crisis so SMEs and venture capitalists can prepare better for future challenges. Enthusiasm to understand these topics provided motivation for this thesis.

First, this thesis provides major theories and the most essential results from previous studies from this field. It provides understanding of SMEs, venture capitalists and financial crisis. This thesis also presents new research on the effects of venture capitalists on SMEs.

The results of this thesis are surprising. It would be expected that venture capitalists have a positive effect on SMEs and they do. But still it is surprising that there were mixed results between companies own estimates of the firm and the results from financial statements. SMEs with a venture capitalist have a more negative outlook for their future in the financial crisis and they estimate that the financial crisis will effect the company's sales and profitability more than it affects companies without venture capitalists. The results from the financial statement show that SMEs with venture capitalists have survived better from the financial crisis. Although, there are not any big discrepancies in the results between SMEs with or without venture capitalists.

The results of this thesis support the view that SMEs should use venture capitalists to survive better in a financial crisis. For further research, it would be interesting to do similar research after the financial crisis and see how the firms developed. Also, it would be fascinating to see research comparing SMEs and larger companies analyzing which have survived relatively better during the financial crisis.

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APPENDIX 1: The questionnaire

Q9. Does your company have venture capitalists?

1.Yes

2.No

Q51. How much followed arguments have effect on the company during financial crisis?

Answer: 1=little, 5= much.

1. Financial crisis decrease companies sales.

2. Financial crisis decrease companies profitability.

3. Lack of financing compromising future of the company.

4. Financial crisis increase the risk of bankruptcy.

5. Overall the financial crisis interfere the company business.