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Cash holdings in Sweden

- A corporate governance perspective

Master Thesis within Finance

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Summary

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Background: In a perfect world, a company would not have to keep any cash at all but because of market imperfections created by information asymmetries and agency problems it has to. Previous research has suggested that a firm's cash holding level is related to its size, growth opportunities and leverage. The Swedish market is particularly interesting to study from a corporate governance perspective, due to a number of specific features such as family ownership, dual class shares, and foreign listing of major companies.

Purpose: The purpose of this study is to investigate the cash holding behaviour among Swedish firms and to study how different corporate governance variables impact cash holdings.

Method: A quantitative approach using regression analysis have been used.

Results: Swedish firms hold more cash than firms from other nations. The cash holding behaviour of Swedish firms is largely similar to that of firms from other nations, in that size and leverage are highly influential. Further, foreign listing and insider holdings mitigates cash holdings, suggesting a decrease in information asymmetries. In contrast to previous studies, we show that CEO presence on the board decreases the cash holdings of a firm.

Conclusions: Corporate governance influence cash holdings of Swedish firms, but not in ways previously suggested by studies made on other countries. The impact of family ownership is beneficial to shareholders and the debate regarding dual shares is overrated.

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"Cash to a company is like nutrition to a human body."

(Li, 2007)

1 Introduction

The decision whether a company should hold excess cash is a debated one. All companies need cash in order to run their daily operations, but it is well documented that some firms hold cash well over the “optimal level”. In good times, shareholders see little use for the extra piles of cash and might push for additional dividends. However, in times of recession a cash cushion could be a good way to ride out the storm without having to ask existing shareholders or the bank for extra funding.

If managers have access to excess cash-flows they tend to waste it on value destroying activities such as empire building (Jensen, 1986). Firms holding too much cash can also become targets for activist investors or LBO-transactions. There are several high-profile examples of this. In the 1980s, RJR Nabisco found itself in the midst of a hostile takeover war between private equity firms that wanted to perform a leveraged buy-out and pay back the debt with the large pile of cash held by RJR Nabisco itself. In the 1990s, activist investor Kirk Kerkorian attempted to take a large ownership stake to push for an increase in the dividends of the (then) cash-rich car company Chrysler. In August 2006, Swedish activist investor Christer Gardell bought, through his investment firm Cevian Capital, 5 percent of the shares in Volvo AB. He then made a number of public statements in the business media where he accused the management of Volvo to be too conservative when it came to the capital structure. Above all, he claimed that Volvo held too much cash on its balance sheet. After months of lively discussions he managed put enough pressure on the management of Volvo to pay out SEK20 billion as a dividend to its shareholders. Today, in the midst of an economic downturn that has reduced demand for Volvo’s products, the company has reduced its workforce by 8000 and recently taken up a debt obligation that pays as much as 10 percent to its investors. These three examples highlights the difficulties associated with a company’s liquid assets. In this thesis we want to study this financial topic more closely, and more specifically examine the cash holding behaviour among Swedish firms.

1.1 Background

In a frictionless world, a firm does not have to hold any cash at all (Mogdigliani and Miller, 1958). Cash is then merely considered as negative debt, and there is no optimal level of cash holdings. However, the world contains frictions such as transaction costs and agency costs and these frictions cause cash holdings to matter. As a result, a number of studies have sought to determine the optimal level of corporate cash holdings. The optimal level of cash needed to

run a company is regarded to be somewhere in the range of 2-5 percent of total sales depending on the type of business. Pinkowitz and Williamson (2007) shows that the optimal level depends on a number of firm characteristics, such as sales growth, R&D, capital expenditures, and volatility of cash flows. Further, Pinkowitz and Williamson (2007) suggest that cash is higher valued for firms with less stable operating cash flows and more promising growth opportunities than it is in mature firms with more stable cash-flows. Ozkan and Ozkan (2004) show on a sample of UK firms that managerial ownership, board composition, and ownership concentration influence cash holdings. There are also notable differences in corporate cash holdings among different countries, which is related to different financing practices and/or differences in legal structures (Dittmar, Mahrt-Smith, Servaes, 2003).

There are several studies conducted on American and European firms' cash holding levels (Baum, Caglayan, Ozkan, Talavera, 2004; Ozkan and Ozkan, 2004; Faulkender and Wang, 2006; Harford, Mansi, Maxwell, 2008; Guney, Ozkan, Ozkan, 2003; Kim, Mauer, Sherman, 1998), but to our knowledge there is no study made exclusively on corporate cash holdings of Swedish firms. The Swedish economy is a quite special one, characterized by a great openness and including large firms with cross-border operations. Since most previous studies are made on large economies, it is not certain that results from these studies can be generalized to the Swedish market. Therefore, our analysis using Swedish data can provide additional insights into the topic of corporate cash holdings.

1.2 Problem discussion

Until recently, the topic of corporate cash holdings has been given relatively little attention in academic research. The main focus has been to determine if there are any specific characteristics of firms with high cash balances (Opler, Pinkowitz, Stulz, Williamson, 2001; Ozkan and Ozkan, 2004 and others). It has been concluded that firms with stronger growth opportunities, riskier cash flows and more limited access to capital markets hold higher cash balances. Next, a number of studies have examined what value shareholders put on cash holdings and how that value varies between different industries and/or different nations (Faulkender and Wang, 2006; Pinkowitz and Williamson, 2007; Dittmar and Mahrt-Smith, 2007). For example, Dittmar and Mahrt-Smith (2007) showed that \$1.00 of cash is valued at only \$0.42 to \$0.88 in a poorly governed firm whereas good governance doubles this value.

Our contribution to the field of corporate cash holdings is two-fold. First, we will provide a focused study on cash holdings of firms in Sweden to be comparable with studies done on

other geographical markets. However, according to Dittmar et al. (2003), variations in cash holdings should naturally exist between different countries due to differences in regulations and financial practices. As a result of this, merely looking at the value of corporate cash holdings from a Swedish perspective can make this study somewhat trivial. Consequently, our second contribution to this field will be to study corporate cash holdings from a corporate governance perspective.

Geographical location, although for a long time ignored in financial research, has shown to have an impact a company's cost of equity and cost of debt respectively and thus on the firms' ability to raise external capital (Loughran and Schultz, 2005). Coval and Moskowitz (1999) were among the first ones to suggest that domestic location has significant effects on institutional investor holdings and they suggest that information asymmetries are positively related to geographic separation. Geographic separation also alienates investors in an international context because of the existence of cross-border information asymmetries (Oxelheim, 2000). However, these information asymmetries have decreased somewhat in the last decades due to the increase in international financial integration, which captures how financial markets are growing closer to each other (Vo and Daly, 2007). International financial integration has eased economic growth by enabling capital to flow more efficiently. Further, it has opened financial markets to foreign investors who now can allocate capital irrespectively of geographic location. This has above all had a great impact on smaller financial markets that now can attract capital from large foreign investors to a larger extent. In Sweden international financial integration took a great leap in 1994 following the abolition on foreign ownership on the Stockholm Stock Exchange. This has decreased the number of Swedish firms seeking to float new equity on foreign equity markets, an activity which reached a peak in the 1980s (Oxelheim, 2000). Geographic separation, cross-border information asymmetries, and international financial integration are all factors making Sweden a very interesting case for this study.

The corporate governance perspective is particularly interesting to study on a set of Swedish firms for at least two reasons. Firstly, as mentioned above, Sweden is a small economy, albeit the home to many large firms. As a result, many of Sweden's large companies have substantial shares of international ownership. High degree of internationally ownership could improve corporate governance if the investors are more sophisticated, or could decrease governance because of geographic separation as discussed above. Secondly, many Swedish firms are traditionally governed by strong ownership families, such as the Wallenberg, Ax:son

Johnson, and Persson families. The importance of these families to the Swedish economy is not to underestimate. For example, around the year of 2000 the Wallenberg family controlled companies accounting for half of the market value of the stock exchange (Agnblad, Berglöf, Högfeldt, Svancar, 2000). In many cases, the family's wealth has been obtained through an industrial company founded some hundred years ago and today the wealth is managed through different investment funds and trusts that own substantial stakes in the Swedish stock market. This structure was firstly recognized in literature by Hermansson (1965) who distinguished 15 families that owned the majority of large corporations, banks and investment companies in Sweden. Hermansson (1965) calls these families dynasties. Through the 20th century, the ownership structure of large corporations became more institutionalised all over the world. However, in Sweden the dynasties only grew stronger to become more powerful. From the beginning of the 1980s until today, Sven-Ivan Sundqvist has on a yearly basis constructed a similar list of strong dynasties, but instead of dynasties he labels them spheres. It is interesting to note that most of the families listed by Hermansson in the 1960s are also listed by Sundqvist today. This suggests that the Swedish dynasties are long lasting and stores their wealth over generations. According to Ozkan and Ozkan (2004), firms controlled by family owners are likely to hold more cash than those controlled by outside owners. A reason for this is that family owners might want to store their wealth inside the firm because of tax reasons. Since Sweden has one of the highest tax burdens in the world, one can argue that this argument is particularly strong in Sweden. This previous research combined with the dynasties, makes the Swedish case extra interesting to study from a corporate governance viewpoint.

Based on the discussion above we have formulated the following research questions:

- What is the cash holding behaviour among Swedish non-financial firms? Are there any significant differences compared to previous research done on other markets?
- How does corporate governance affect corporate cash holdings? How do ownership structure, board structure, and share characteristics affect the level of cash holdings?

1.3 Purpose

Our purpose with this thesis is to provide additional insights into the topic of corporate cash holdings by studying Swedish non-financial firms. The sample will be analysed from a corporate governance perspective, to study what impact governance structures has on corporate cash holdings in Sweden.

1.4 Delimitations

This study will only consider cash holdings of Swedish companies listed on the Stockholm stock exchange between the years 1999-2008. Only non-financial companies will be included since financial firms are special in terms of balance sheet structure and sources of funding. Further, only firms that have their domicile in Sweden will be included.

1.5 Thesis outline

The rest of the thesis is organised as follows. Chapter 2 includes the relevant theoretical framework with focus on motives for holding cash and agency theory. At the end of chapter 2, the hypotheses will be developed. Chapter 3 discusses the methodology used, the process of gathering data and developing a sample, as well as explaining the regression model. Chapter 4 describes the empirical findings from the study in text as well as tables. Chapter 5 contains an analysis of the empirical findings. Chapter 6 concludes the thesis and suggests some interesting fields for future research.

2 Theoretical Framework

In this part of the thesis we will describe and discuss the existing theories in the topic of corporate cash holdings. Since there are several, often conflicting, financial theories related to the topic, we have narrowed down the literature review to only include the most important underlying assumptions that affect corporate cash holdings. We start by describing some early financial theories, move on to describe the possible motives for holding cash, and finally present some of the previous studies made on the subject.

2.1 Irrelevance of cash holdings

The topic of corporate cash holdings has until recently been given relatively little attention in financial research. The reason, according to Kytönen (2005), is that liquidity is not belonging to the mainstream of the theory of finance. In classical financial research, focus has been on how to maximize the value of an investment with respect to the trade-off between risk and return. This is the basis of the Capital Asset Pricing Model (CAPM), developed by Sharpe (1964) and Lintner (1965), and is structured on the assumption that cash holdings is an irrelevant matter and plays no role in this widely accepted valuation framework.

That a company's cash holdings are of no importance was first suggested by Modigliani and Miller (1958). They proposed that this scenario always holds in a frictionless world. In fact, if there are no transaction costs, no taxes and no agency conflicts a firm would not have to hold any cash at all, or at least only a very small amount of it. If there is no optimal cash level, a firm could simply raise funds from whatever source whenever internal funds are insufficient to complete a project or an acquisition. This could of course be done at fair prices, since there are no additional transaction costs, liquidity premiums, or tax benefits associated with a particular type of funding. Hence, if a firm would borrow money and only keep it as cash, shareholder wealth would be unchanged.

However, the financial markets of today are not frictionless. As a result, there might be valid reasons to why a firm decides to hold non-operating assets, i.e. cash, on its balance sheet. Keynes (1936) suggested that individuals hold cash for three reasons: for transactions, as precaution against unanticipated events, and for speculative purposes. The same can be said to hold for companies, although there are other aspects affecting this matter that are associated with the relationship between management and shareholders, often referred to as agency theory. Agency theory, information asymmetry and adverse selection problems are all

affecting the extent to which a company decides to hold liquid assets. Below we will discuss these issues.

2.2 Theoretical motives for holding cash

2.2.1 Transaction costs motive

The transaction cost motive focuses on the additional costs of obtaining outside funds. The cost can be divided into two parts, a fixed cost plus a variable cost proportional to the amount raised (Opler, Pinkowitz, Stulz, Williamson, 1999). If transaction costs are present, a firm short of cash has to raise funds in the capital markets, liquidate existing assets, reduce dividends, and/or renegotiate existing financial contracts. Unless a firm has assets that can be liquidated at a low cost, it will prefer to turn to the capital markets. However, raising cash irrespective of using asset sale or the capital markets is costly. The fixed costs of accessing outside markets will encourage the firm to raise funds as seldom as possible and instead keep some cash and liquid assets as a buffer. Thus, with transaction costs, there will be an optimal cash holding level which encourages the firm to hold a certain cash buffer.

2.2.2 Precautionary Motive

The precautionary motive states that a firm should hold cash as a buffer to meet unanticipated expenses or unspecified contingencies. For example, a cyclical firm can store some cash during an economic boom to carry as insurance when the economy turns. The precautionary motive is most likely affected by a number of variables, such as volatility in the economy, volatility in operations, competitive environment and financial leverage. (Damodaran, 2005)

The precautionary motive for a firm's cash holdings is studied by Han and Qiu (2006), assuming that cash flow volatility could affect a firm's cash holding behaviour. Their results show that there is a positive relationship between cash holdings and future cash flow volatility, confirming existing theory.

Some companies see additional cash holdings as a strategic weapon that they can use in the future to take advantage of opportunities that might arise (Damodaran, 2005). These opportunities may never arise but it would still be rational for firms to have cash at hand for a "what if?" scenario. Obviously, the advantage of holding cash will be the greatest at times when it is difficult to raise additional funding or in markets where capital markets are difficult

to access. This argument is known as “the long purse theorem” (Ogden, Jen, O’Connor, 2003).

2.2.3 Information asymmetries

The apparent motives described above (the transactions motive and the precautionary motive) would not exist if there were no market imperfections. But, as mentioned in the introduction, market imperfections do exist. These are based upon the concepts of information asymmetries, agency costs, and the opportunity costs of foregone investments. Information asymmetries, as proposed by Myers and Majluf (1984), that exists between management and external investors make external financing costly. Since the market does not have access to all important information concerning the state of the company, it will demand a premium to invest in or lend to the company. If information asymmetries are large, the company will face high costs of raising funds. In the light of this, management will prefer to finance the company first with retained earnings, then with debt, and finally with equity. This reasoning is known as the pecking-order theory (Myers, 1984). The purpose of this order of financing is to avoid, or at least minimise, asymmetric information costs and other financing costs. It also reflects the motivations of the manager to retain control of the firm and avoid the seemingly inevitable negative market reaction to an announcement of a new equity issue. The pecking order theory suggests that a firm that faces extreme adverse selection costs might end up not investing in value creating projects since it can not raise the capital needed. If a firm faces this scenario, it is valuable to build up financial slack (Myers, 1984).

Larger firms are generally more closely monitored than smaller firms, making information asymmetries larger at smaller firms. This is one of the reasons, although not the only one, suggesting that smaller firms tends to on average keep a higher level of cash holdings. In addition, larger firms tend to be more diversified and thus experience lower risk of going into financial distress, supporting the notion that smaller firms should hold more cash (Titman and Wessels, 1988). Excess cash can enable a firm to take advantage of unexpected growth opportunities. If there is no cash available when at the time of a possible investment, a firm has to turn to the external capital markets. If the firm faces high adverse selection costs (costs generated from information asymmetries), this can be very costly and difficult because of differing interests between shareholders and bondholders. Hence, a firm that possesses valuable growth options should hold cash to avoid foregoing profitable investment opportunities.

2.2.4 Agency costs

There are two types of agency costs that can be directly related to cash holdings: agency costs of debt and agency costs of managerial discretion. Agency costs of debt arise when the interests of shareholders differ from those of debt holders and/or when there are diverging interests between different classes of bondholders. It can create moral hazard problems when a highly levered firm wants to raise additional debt in order to avoid financial distress. The existing bondholders will oppose the risk shifting situation, also known as asset substitution, since it will shift value from bondholders to shareholders (Jensen and Meckling 1976). Moreover, a highly levered firm is likely to face an underinvestment problem as proposed by Myers (1977), as old shareholders have little incentive to provide additional equity even when a firm has profitable investment opportunities since the cash-flows from these investments are being distributed to the creditors. One measure to avoid agency costs of debt is simply to hold more cash, and in doing so reducing the firm's net debt (Ozkan and Ozkan, 2004). This notion justifies the assumption that there is a negative linking between leverage and cash holdings.

The problem of agency costs of managerial discretion is associated to the conflict between management and shareholders. The decision of whether to keep cash or pay them out to shareholders is central in the principal agency theorem (Jensen, 1986). Cash might be the ultimate source of the principal agency problem since it weakens the discipline of management and can thus be costly in several ways. First, management can hold cash as a cushion simply because it is risk-averse (Fama and Jensen, 1983). This can be the case if management has a lot of their own wealth tied up in the company's shares. Second, management can hold cash to have more flexibility to pursue its own objectives (Jensen 1986). If management has a lot of cash at hand it can use it to build empires, i.e. waste cash on value-destroying acquisitions. Third, management also has an incentive to hoard cash to increase the amount of assets under their control and to gain discretionary power over the firm's investment decisions. Having cash available to invest, the manager does not have to turn to the capital markets and provide detailed information on the project but can instead spend it as freely as wanted (Jensen 1986). The implication is that more liquid assets in a firm will lead to increased agency problems (Myers and Rajan, 1998). This further suggests that excessive cash holdings are associated with weak corporate governance.

2.3 Previous studies

2.3.1 Studies on corporate cash holdings in specific geographical areas

Opler et al. (1999) study cash holdings of US publicly listed firms between 1971 and 1994. They find that certain firm characteristics determine the amount of cash held by a firm. Firms with strong growth opportunities, higher business risk, firms of smaller size, hold more cash than other firms. Firms with the easiest access to capital markets, i.e. large firms and those watched by credit rating firms, tend to hold less cash. Regarding the agency theory, Opler et al. (1999) find little evidence of the management entrenchment hypothesis as an explanation for the level of cash holdings of a firm. The study was comprehensive in finding the underlying factors of corporate cash holdings; however, it was narrowly focused by studying only US firms.

Pinkowitz and Williamson (2001) take the geographical factor into account by comparing cash holdings among firms from three different countries (i.e. Germany, US, and Japan), and find significant differences among them. They show that Japanese firms hold more cash than US or German firms, suggesting that this has to do with the monopoly power of banks in which strong Japanese banks force Japanese corporations to hold large cash balances to reduce their financial riskiness. A similar study was conducted by Guney, Ozkan, and Ozkan (2003), who investigates cash holdings in the same countries as Pinkowitz and Williamson (2001) but adding France to the sample. Guney et al. (2003) find strong support for a negative relationship between leverage and cash holdings.

Ferreira and Vilela (2004) conduct a study on corporate cash holdings on firms in the EMU area, treating all firms in the area in one single sample. The authors suggest that cash holdings are positively affected by the investment opportunity set and cash flows and on the other hand negatively affected by asset's liquidity, leverage, and size. They also suggest that as capital markets become more developed in a country, the cash holding levels tend to decrease. The study provides interesting data on the cash holdings of an area geographically close to Sweden.

2.3.2 Studies of corporate cash holdings and corporate governance

Dittmar, Mahrt-Smith, and Servaes (2003) study cash holdings from a corporate governance perspective on a sample of firms from 45 countries (including Sweden) in a single year (1998). The authors find strong negative association between shareholder rights (used as a

proxy for agency costs) and corporate cash holdings, hence proving that agency costs are important in determining corporate cash holdings in firms all over the world.

Anderson and Hamadi (2006) conduct a study on Belgian firms on ownership, control and liquidity (i.e. cash holdings). Specifically, they investigate how family ownership affects the amount of cash holdings a firm holds. Anderson and Hamadi (2006) find a clear positive association between both family ownership and managerial ownership to the cash holdings of a firm. The authors explain this as a consequence of risk aversion among poorly diversified owners.

Chang and Noorbakhsh (2006) perform a study on nearly 21,000 firms in 48 countries. They include Sweden in their sample, but in accordance with Dittmar et al. (2003) they only study cash holdings in a single year, namely 2000, and not over a period of time. The authors suggest that the factors that contribute to differences in the levels of international cash holdings have gone largely unnoticed in the literature. Their results are consistent with the ones from Dittmar et al. (2003), thus supporting the agency problem theory. The results are also consistent with Opler et al. (1999) in that smaller firms tend to hold larger relative cash holdings than larger ones.

Drobetz and Grüninger (2007) conducts a study on cash holdings in Swiss firms which is interesting from the viewpoint that one single country, a small export-oriented one just like Sweden, is studied over a ten-year period and that some corporate governance measures are scrutinized. The authors show that a higher percentage of managerial ownership leads to lower cash holdings, indicating that cash holdings are negatively affected by a decrease in agency problems between management and shareholders. However, they also show that a firm's cash holdings increase when managerial ownership becomes large in absolute numbers. This could reflect the management's risk aversion, since they might have a large part of their own wealth tied up in the company. Ozkan and Ozkan (2004) also note this pattern in the relation between managerial ownership and cash holdings, claiming it is U-shaped.

Chen (2008) studies corporate governance and cash holdings for a sample of American firms which the author divides into new economy (i.e. computer, software, telecom, internet firms) and old economy firms. Chen (2008) finds that CEO ownership and board independence affect cash holdings differently among the two firm classifications. In particular, higher managerial cash holdings tend to reduce cash holdings in old economy firms and higher board independence tend to increase cash holdings in listed new economy firms.

Harford, Mansi, Maxwell (2008) study how cash holdings of US firms is affected by agency problems. They show that firms with weak corporate governance structures actually have smaller cash reserves. Harford et al. (2008) explain this by the notion that management of those firms are afraid of keeping too much cash to attract attention by shareholders and are instead wasting the cash on acquisitions and capital expenditures, no matter if those investments are value adding.

2.4 Hypotheses development

In the light of the theory explained above, we have constructed three classes of hypotheses related to corporate governance that subsequently will be tested and analysed. The hypotheses are related to ownership structure, board characteristics, and share properties.

2.4.1 Ownership Hypotheses

The first area we want to test in this study is whether the ownership structure has an impact on cash holdings. We will test this from two angles, namely insider ownership and family ownership.

In previous literature, it has been documented that the ownership structure of a firm indeed can have an impact on a firm's cash holdings (Ozkan and Ozkan, 2004). For example, the notion that managerial ownership can help align the interests of managers with the interests of shareholders is supported by a large body of literature. That is, with increased ownership stakes in the company there is a lesser likelihood that the management will pursue activities that are value-destroying for the company, such as empire building or holding excess amounts of cash (Jensen, 1986). To the extent that this theory is true and assuming that cash holdings is costly, then we can expect cash holdings and managerial ownership to have a negative relationship (called the interest-alignment effect). However, if management owns a large share of their personal wealth in the company's shares, this might make the managers risk avert, thus holding more cash (Fama and Jensen, 1983). This pattern has been shown by Ozkan and Ozkan (2004), who notes that the influence of managerial ownership on cash holdings is in fact U-shaped. This means we have two contradictory hypotheses:

Hypothesis 1a: Managerial ownership decreases the level of cash holdings

Hypothesis 1b: Managerial ownership increases the level of cash holdings

The presence of a large shareholder, or blockholder, plays an important role in mitigating some of the firm's agency problems (Holderness, 2003). Schleifer and Vishny (1986) propose

that blockholders are good for shareholders, since they help mitigating the free-rider problem, perform a monitoring function, and reduce the scope of managerial opportunism. However, large shareholders can also act to promote their own self interest (Schleifer and Vishny, 1997). But it is not just important to investigate whether there a blockholder exists to note an influence on cash holdings. What really matters is the identity of that shareholder (Ozkan and Ozkan, 2004). There can be great difference in the governance of a company if it is owned by a financial institution versus a family. Family owners tend to be active in governing the company, e.g. Swedish family owners are engaged in a management position in 70 percent of cases (Faccio and Lang, 2002). This could lead to increased agency problems between management and shareholders since the family might want to keep their control over the firm inefficiently long from the outsider shareholder's perspective (Ozkan and Ozkan, 2004). With this in mind, we support the notion that a family owned firm will carry higher cash holdings, i.e.:

Hypothesis 2: Family ownership increase the level of cash holdings

2.4.2 Board hypotheses

To mitigate agency conflicts between managers and shareholders a board is appointed to oversee the work done by the management. The board can contain firm insiders as well as outsiders. It is often argued that outside board members (i.e. non-executive) are appointed to the board to act in shareholders' interest and that outside directors have an incentive to signal that they indeed act in that way (Fama and Jensen, 1983). For that reason, one can assume that boards with members from the outside will make decisions that are better (or at least more objective) than boards dominated by executives. If outside board members do their duties and perform significant monitoring and disciplining function over managers, the board composition should affect cash holdings. More specifically, assuming increased oversight leads to a reduction in agency costs, a board composition of only firm outsiders will lead to lower levels of cash holdings. Harris and Raviv (2008) oppose this view by suggesting that shareholders can sometimes benefit from an insider-controlled board. Still we believe that the theory is in favour for that an insider-controlled board should have higher cash holding levels, leading to the following hypothesis:

Hypothesis 3: If the CEO is also on the board, hence creating a "non-independent" board, this will lead to a higher level of cash holdings

An additional aspect to the board composition is the size of the board. A larger board should lead to increased monitoring that will be particularly effective when manager's opportunities to consume private benefits are high (Harris and Raviv, 2008). On the other hand, a large board faces a more rigid decision making process and studies have shown that smaller boards are more efficient as they provide greater decision making (Yermack, 1996). A large board can also face free-riding problem, as board members feel the importance of their contribution being reduced with every extra member (Harris and Raviv, 2008). Harford et al. (2008) find no significant relation between board size and cash holdings. Since previous research is conflicting, we wish to test both sides of this hypothesis, i.e.:

Hypothesis 4a: A larger board will lead to increased cash holdings

Hypothesis 4b: A larger board will lead to decreased cash holdings

2.4.3 Share properties hypotheses

For shareholders, two issues affect the ownership stake: corporate ownership measured by cash-flow rights and control measured by voting rights (Faccio and Lang, 2002). Ownership and control rights can differ because firms can issue different classes of shares that provide different voting rights for a given number of shares. Another reason why ownership and control can differ is because of pyramiding and holdings through multiple chains (further described by Faccio and Lang, 2002). The shares that hold extra voting power have in several studies shown to trade at a premium over non voting shares (Zingales, 1994; Megginson, 1990; Muus, 1998). This is consistent with the notion that control can provide large private benefits and is thus desirable (Jensen and Meckling, 1976). In Sweden, some special voting shares can have up to one thousand times the voting power of ordinary shares (e.g L.M. Ericsson in 2001). Since the one-share-one-vote does not apply, on average a shareholder of special voting shares is able control 20 percent of a company by only owning 9.83 percent the capital (Faccio and Lang, 2002). In the stock market shares with superior votes are often very illiquid and tend to stay with the same owner for a long time. This system of dual class shares has been up for scrutiny in the European Commission as it has been argued that it creates boarders for international institutional investors and that the rules concerning openness and information are insufficient. Specifically, it is argued that the system creates increased agency costs between holders of voting shares and other shareholders. Consequently, it is reasonable to assume that companies with dual class shares hold more cash holdings than other firms.

Hypothesis 5: Dual class shares leads to higher levels of cash holdings

An additional issue regarding the properties of the share has to do with foreign listing. If listed abroad, the company reaches a larger investor base and thus more potential sources to raise external capital from. As international (probably more sophisticated) investors get the possibility to invest in the firm, agency problems will be mitigated, decreasing inefficient cash holdings. Further, listing abroad increases the awareness of the company with foreign banks, hence increasing possible sources of funding. However, taking the recent equity market integration into account (Oxelheim, 2000), this factor may not be very significant anymore. Still, we want to test whether a firm's listing abroad has any impact on its cash holdings.

Hypothesis 6: Foreign listing of the firm's shares lead to decreased cash holdings

3 Methodology and data collection

3.1 Research design

Research design is a framework for the gathering and analysis of data. The choice of research design reflects the stands the researchers have taken regarding what priority will be given to the number of dimensions and aspects in the research process (Bryman and Bell, 2003).

3.1.1 Research philosophy

The research philosophy is associated with the view that was taken on the research process. The philosophy captures the way the researchers view the world and subsequently affects the research design, the data collection and the analysis of the study (Saunders, Lewis, and Thornhill, 2003). In this study, we are focused on objective and quantifiable observations that can be statistically analysed and result in law-like generalisations. Hence, the philosophic view that we use in this study reflects the principles of positivism.

3.1.2 Research approach

Research approach can be described as the theoretical design of the research. Of the two main approaches, the one that is best suited for our study is the deductive one. The deductive approach has a structured design in which existing theories are examined through hypotheses testing (Saunders et al., 2003), which fits well with how we want to carry out our study. We want to find out the characteristics of corporate cash holdings in Sweden and whether the level is affected by different corporate governance measures. This is done by performing a quantitative study on Swedish firms during the years 1999-2008. The thesis is in some aspects based on the research papers by Opler et al. (1999) and Drobetz and Grüninger (2007).

3.2 Data collection

In order to carry out the practical part of this thesis, secondary data was gathered from Datastream, a financial database provided by Thomson Reuters Corporation. This company specific data covered most of our needs to perform the study, but a number of parameters could not be obtained through this method. In these cases, we complemented our data from the Reuters 3000Xtra Kobra (also provided by Thompson Reuters Corporation). In a few specific cases, we used primary data conducted straight from firms' annual reports.

The data covering the corporate governance was obtained through multiple sources. Firstly, some of the ratios were possible to gather straight from Datastream. When this was done, we were careful to check that the definition indeed measured what we were aiming for. Secondly, we used two sets of books written by Sundqvist et al. (1999-2008) who describes ownership data and statistics of the boards of Swedish companies for all years covered in this study.

3.2.1 Sample selection

Our sample is based on Swedish publicly listed firms, with data from the years 1999-2008. We chose this time frame for two reasons. First, this time frame takes several stages in the economic cycle into account and thus the results will not be biased in this way. Second, going further back in time would severely reduce the number of firms we could include, hence making the study less reliable.

We started with all firms listed on the Stockholm stock exchange as of the end of 2008, which turned out to be 259 firms. Consistent with previous studies, we excluded financial firms (including investment companies and insurance firms) due to their regulated environment and the complexity in their balance sheet structures, reducing our sample to 208 firms. Further, only firms listed in Sweden that also have their domicile in Sweden were to be included. As a result, an additional 16 firms were excluded, including firms such as Stora Enso (Finland), AstraZeneca (UK), and ABB (Switzerland).

As the next step, we dropped firm-year observations for which there were missing variables in the model during the sample period. Lastly, from these firms, only those firms with at least five continuous time series observations during the sample period were to be included in the sample (consistent with Ozkan and Ozkan, 2004). These criteria were implemented to get consistency in the data set, even though we realise that there is a risk of survivorship bias. After the criteria were imposed we had a sample consisting of 154 firms, representing a total of 1368 firm-year observations.¹

¹ A table can be found in the appendix illustrating the number of firms per year as well as which firms that are sphere owned.

3.2.2 Construction of firm specific variables

Apart from corporate governance measures, we include other firm characteristics that are expected to affect cash levels. This broad set of firm specific variables, represents a set of control variables and are included in previous studies in which the authors have tried to determine the optimal level of cash holdings given the firm characteristics.

The method of measuring cash holdings is of great importance to the result of this study. To be consistent with previous literature, we refer to cash holdings as cash and cash equivalents to net assets, where net assets are computed as book value of assets less cash and cash equivalents (Opler et al., 1999). The variable used in the regression will be the log of this value (in EViews defined as LOGCASHH) which is also consistent with Opler et al. (1999). The rest of the variables to be used in the regression are defined as follows, all which are consistent with Opler et al. (1999) if nothing else is stated. For size (SIZE) we use the natural logarithm of the book value of assets. For growth opportunities (MTBV), we use the market-to-book value, defined as book value of assets minus book value of equity plus market value of equity to the total assets. For leverage (LEVERAGE), we use total debt to the book value of assets. For cash flow (CASHF), we measure this as earnings after interest, taxes and dividends but before depreciation divided by net assets. We use the ratio of net working capital minus cash, to total assets as a proxy for liquidity (WORKCAP). As a proxy for asset tangibility (ASSETT) we use the ratio of fixed assets, i.e. PP&E, to total assets (Drobetz and Grüninger, 2007). For profitability (PROFIT), we use a proxy of this defined as operating income to total sales (Drobetz and Grüninger, 2007). We measure capital expenditures (CAPEX) as capital expenditures to total assets. To measure firm recognition abroad (FIRMR), we use a firms export rate and international sales to total sales as a proxy (Dahlqvist and Robertsson, 2001). For dividend (DIV), we use dummy of one for firms that pay a dividend versus a dummy of zero for firms not paying dividend.

3.2.3 Construction of corporate governance variables

To test for the impact of corporate governance on cash holdings we incorporated a number of corporate governance variables as explanatory variables. As for managerial holdings, we used a proxy measure by Datastream called insider holdings (INSIDER), which is believed in a reasonable way capture the effect of managerial ownership.

Family ownership is a fuzzy label and thus it has to be defined clearly. As mentioned in the background, Sweden has a tradition of having strong ownership families that, if not started the

company, at least been involved and owned shares in it for a long time. The families' ownership stakes are today often held through foundations and investment companies. To capture this ownership variable we have decided to use a definition provided by Sundqvist et al. (2008) who lists a number of spheres. All spheres are not strictly family oriented (e.g. Industrivärden) but most were founded by families and thus we consider this definition a reasonable proxy to family ownership. A strict criterion was to only include a sphere which has long-term interest in the company. Consequently, some investment firms were deleted. After careful consideration we chose to include 11 spheres that today have major holdings and influence in the Swedish stock market². For the possibility to generalise our findings, we will assign a dummy variable to any company where a sphere owns 10 percent or more (SPHEREO). This ratio of 10 percent is often defined as the critical percentage of voting rights needed in order to possess a controlling share in the company (Faccio and Lang, 2002), which is also consistent with Ozkan and Ozkan (2004).

When measuring board structure we have chosen to look at the number of seats on the ordinary board. However, because of the possibly high correlation between board size and firm size, we divide board size by the log of total assets (LOGBOARDS), which is consistent with Harford et al. (2008). In some previous Anglo-Saxon studies (Ozkan and Ozkan, 2004; Harford et al., 2008), tests have been made with respect to the chief executive officer (CEO) and the chairman of the board being the same person to see whether the entrenchment effect is greater with this structure. In our study this is not very meaningful to study since CEO/COB dualship is not allowed in Sweden. Instead, we have chosen to focus on whether the CEO of the firm is also represented on the board of the firm, a situation which has lately been criticised in Swedish business media (Nachemson-Ekwall, 2009). If the CEO is also represented on the board, a dummy variable of one will be assigned (CEODUAL).

If a firm has multiple classes for its shares, then a dummy variable of one will be assigned (DUALS). We use foreign listing (FOREIGNL) as a proxy for the firm's access to international funding. If the firm has its share listed abroad, a dummy variable of one will be assigned.

² The spheres included are: Ax:son Johnson, Bennet, Douglas, Industrivärden, Lundberg, Paulsson, Persson, Schörling, Sten A Olsson, Stenbeck, and Wallenberg.

3.3 Regression specification

Based on the variables discussed above, the regression that will be used will look like this:

$$\begin{aligned} LOGCASHH_{i,t} = & C + \gamma_0 SIZE_{i,t} + \gamma_1 MTBV_{i,t} + \gamma_2 LEVERAGE_{i,t} + \gamma_3 CASHF_{i,t} + \gamma_4 WORKCAP_{i,t} \\ & + \gamma_5 ASSETT_{i,t} + \gamma_6 PROFIT_{i,t} + \gamma_7 CAPEX_{i,t} + \gamma_8 FIRMR_{i,t} + \gamma_9 DIV_{i,t} + \gamma_{10} INSIDER_{i,t} \\ & + \gamma_{11} SPHEREO_{i,t} + \gamma_{12} LOGBOARDS_{i,t} + \gamma_{13} CEODUAL_{i,t} + \gamma_{14} FOREIGNL_{i,t} + \gamma_{15} DUALS_{i,t} \end{aligned}$$

3.4 Regression analysis

In order to fulfil the purpose with this study, a regression analysis is constructed. This is a common tool used in quantitative studies in order to draw statistically certain conclusions. Petersen (2005) argues that researches choice of regression model is often incorrect giving rise to faulty conclusions. Therefore it is very important that we employ the correct model given our data set to reinforce our results.

3.4.1 Choice of regression model

Since the data in this study comprise both time series and cross-sectional elements, the set of data would be known as a panel of data. There are a several benefits of using a panel data analysis, which can determine and quantify effects undetected in cross-sections and time-series analysis (Baltagi, 1995). When working with panel data, the choice of regression model is not entirely simple. Thus, a number of tests are employed to ensure which model would be appropriate. However, Thompson (2005) argues that a sample consisting of only ten years is too small to apprehend consistency and unbiased results. This leads us to choose a cross-sectional approach instead. Hence the data is to be treated as if it was from only one single period, i.e. cross-sectionally (pooled data) and not as panel data.

Due to our sample characteristics, the standard Ordinary Least Square (OLS) method should be the appropriate one. However, since there are several cross-sections related to the same firm we can expect correlation and we can also expect heteroscedasticity.

To assure that results from the OLS regressions are Best Linear Unbiased Estimator (BLUE) there are a number of assumptions that can not be violated. The normality assumption could hinder us to make valid inferences about our parameters. However, since we treat our data as cross-sectional and as a result have a large sample this is of less importance (Brooks, 2008). Our major concern is heteroscedasticity and autocorrelation which both could impact and

hinder the validity from our findings to a larger extent. Therefore the Generalized Least Squares (GLS) method is well thought-out, which allows each firm a different error structure.

To retrieve robust standard errors, several methods are considered. However, since our variables are expected to show correlation between cross-sections and different error variance in each cross section, this is best handled with the white cross-section coefficients method (EViews User Guide, 2007).

3.5 Method Evaluation

The quality of a research should always be revised both by the authors themselves and objective external readers. Several issues might affect the findings in a negative way causing a reduction in the actual quality of the examination conducted. Conclusions should not in all cases be seen as absolute and should be questioned (Saunders et al., 2003). Three of the most important criteria for judging research within business administration are reliability, validity and generalizability (Bryman and Bell, 2003). These issues will be examined below.

3.5.1 Reliability

The methodology must be reliable to ensure that the research results are trustworthy. Reliability is concerned with the fact that the data is autonomous and independent from external circumstances. The researchers have to ask themselves what the probability is that other researchers would come up with the same results (Saunders et al., 2003). Reliability is most often of concern in quantitative research since the researcher is most likely interested in whether the measurement technique is stable or not (Bryman and Bell, 2003).

In this study, primary data has been gathered and analysed based on existing theories in the subject. Since the company specific data is collected from a highly recognized database used by academics as well as professionals, i.e. Datastream, we find no reason to doubt the reliability in the data. Further, since we mainly use primary data instead of secondary data we have had the ability to ensure that the data fits the specific needs of this study. The only secondary data gathered is the one concerning the ownership data. This was gathered from the books by Sundqvist et al. (1999-2008) which are believed to be highly reliable, not the least since they are published from a company (SIS Ägarservice) which is specialised in this type of data and has been around for a very long time.

Regarding the regression analysis, we used the statistical software package EViews. As explained above, we checked that all explicit assumptions were fulfilled for our regression to present a correct result. After adjusting the regression model to these assumptions, we reached robustness standard errors which indicate that the results are indeed reliable.

3.5.2 Validity and generalizability

The content of validity refers to how accurate the results are compared to reality, i.e. if the data really measures what the authors intended to. Generalizability is sometimes mentioned as external validity and is concerned with to what extent the research conducted is possible to generalise to a complete population and whether the findings could be in the same way valid to other settings (Saunders et al., 2003).

In this study, the purpose is to study the cash holding behaviour of Swedish firms. Since numbers do not generally lie and are taken straight from official sources we believe that the study fulfils the criteria for validity. Further, we believe that the ratios are constructed in such a way that they explain what intended. However, the choice to only study the Swedish market can be questioned since the market is quite small and special and thus there might be difficulties in drawing valid conclusions. We could have increased the validity by including other Nordic countries as well but due to limitations in data gathering we chose not to do so. The same goes for generalizability since the scope of the study is narrow and thus one has to be careful to generalize our results to other financial markets. This too could have been solved by increasing the sample to include countries from the whole Nordic area, but then the purpose of the study would have been different.

Another issue is that some previous studies used lagged values for some of the variables to try to capture the cause and effect of these variables on cash holdings. This would have been advantageous for our study as well, but due to inconclusive data on some variables together with time limitations we have chosen not to adjust for this.

Finally, a concern that can be discussed is that we have chosen to focus on all listed firms in Sweden, with no respect to industry or maturity of the business. Even though we hope to capture this in some of the firm specific variables, the sample could have been sub-divided into industry groups to be able to notice differences among different kinds of firms.

4 Empirical Results

4.1 Descriptive statistics

The table below provides descriptive statistics for the sample. The data set includes 1368 observations from 154 firms covering the period from 1999-2008. We have included the minimum, 1st percentile, median, 3rd percentile, maximum, mean, and standard deviation.

Table 4.1 Descriptive statistics³

	Min	1 st Quartile	Median	3 rd Quartile	Max	Mean	Standard deviation
LOGCASHH	-7,84	-3,06	-2,22	-1,30	1,90	-2,14	1,35
CASHH	0,04%	4,49%	9,98%	21,70%	87,00%	16,44%	17,15%
SIZE	8,89	12,57	13,73	15,45	19,71	14,12	2,11
MTBV	0,19	0,90	1,29	2,02	27,95	1,88	2,13
LEVERAGE	0	3,28%	16,83%	30,59%	75,90%	18,75%	16,05%
CASHF	-674,15%	1,29%	7,24%	11,54%	178,29%	-1,59%	49,52%
WORKCAP	-71,30%	2,29%	16,64%	33,26%	696,95%	26,60%	49,53%
ASSETT	0,00%	6,31%	16,97%	35,16%	99,20%	23,06%	20,47%
PROFIT	-2419,41%	-1,13%	4,43%	9,50%	68,73%	-11,40%	101,87%
CAPEX	0	1,51%	3,26%	5,87%	90,70%	4,78%	6,00%
FIRMR	0	0	13,21%	31,64%	78,91%	17,19%	18,06%
DIV	0	0	1	1	1	60,16%	48,97%
INSIDER	0	0	15,00%	39,13%	88,76%	21,06%	22,47%
SPHEREO	0	0	0	0	1	20,18%	40,15%
LOGBOARDS	0,17	0,40	0,46	0,51	0,90	0,46	0,08
BOARDS	3,00	5,00	6,00	7,00	10,00	6,48	1,39
CEODUAL	0	0	1	1	1	66,62%	47,18%
FOREIGNL	0	0	0	0	1	9,72%	29,63%
DUALS	0	0	1	1	1	67,51%	46,85%

CASHH is the ratio of cash and cash equivalent to total assets. BOARDS is the size of the board. All other variables are explained in section 3.2.2-3.2.3

As can be noted in table 4.1, some mean values are very peculiar due to the fact that a few firms show extreme values, causing a high standard error. This has the effect that the mean values are often biased and thus the median values of most firm specific variables are more appropriate to analyse and draw conclusions from.

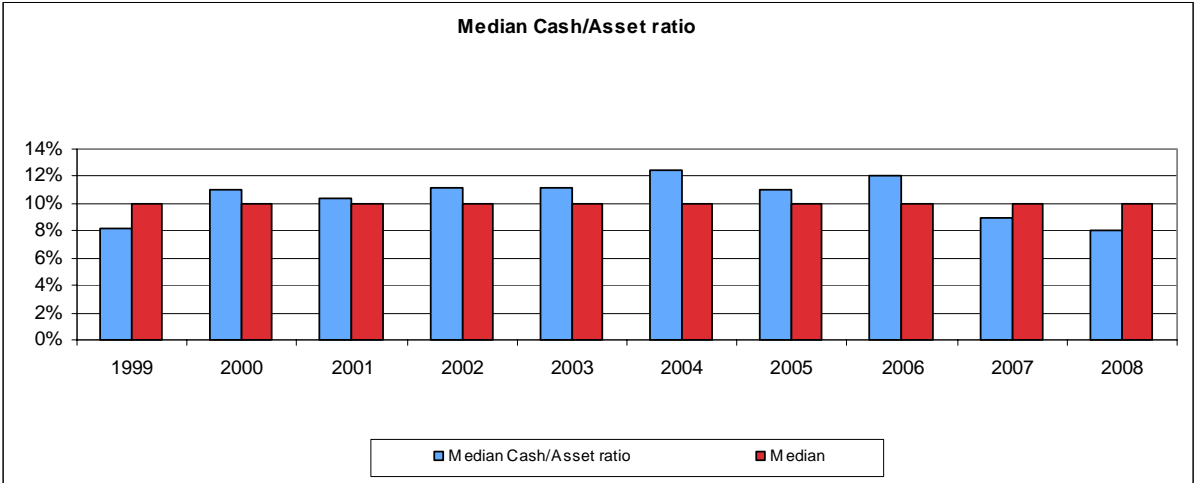
The main variable in our analysis, i.e. cash holdings, has a median value of 10.0 percent. The median firm has a leverage of 16.8 percent and a market-to-book value of 1.3. The median firm has 13.2 percent of its sales abroad and does pay a dividend. As for the corporate governance measures, we note that the mean insider ownership is 21.1 percent, with a median of 15.0 percent indicating that a few firms are heavily insider owned. The largest insider

³ A few firms that distorted the descriptive statistics have been removed from the sample, mainly firms which have performed an equity issue which have boosted cash holdings. However, the table still consists of some extreme observations.

ownership in a single firm was as high as 88.8 percent. The spheres own 20,2 percent of the firms in the sample. Just about 10 percent of the firms are cross listed on another exchange. The average board has 6.5 seats and the CEO is present on the board in 66.6 percent of all firms.

The diagram below displays the median cash holding over our sample period compared with the median value for the whole period. One can note that in the period 1999-2000 firms' cash holdings were increasing, a time when the economy was booming. From year 2004 until 2008 cash holdings have been decreasing with the exception of 2006. The drop in 2005 might relate to regulatory changes, i.e. the implementation of IFRS.⁴ The increase in 2006 can be due to the strong economy at the time. The last two years we seen a hefty reduction in cash balance, in the year 2008 a 35 percent drop has occurred compared to 2006 peak. Although the domestic and global economy experienced a substantial downturn first in the second half of 2008, the slump in 2007 can be due to the fact that many firms paid out substantial dividends to shareholders that reduced cash holdings. Even though the diagram provides an illustration of cash holdings over time, we will not draw any further conclusions on it since this is not the main focus of the study.

Diagram 4.1 Cash to assets ratio over time



4.2 Results from standard OLS

The firm characteristic variables are in many respects correlated to each other and this could cause multicollinearity problems. To check this, we formed a correlation matrix for the

⁴ No adjustments for IFRS are made in our study.

Table 4.2 Correlation matrix

ASSET																	
ASSET	1.00	CAPX															
CAPX	0.21	1.00	CASH														
CASH	0.07	0.05	1.00	CEQA													
CEQA	0.18	0.05	-0.04	1.00	DIV												
DIV	0.23	0.02	0.27	0.26	1.00	DAS											
DAS	0.10	-0.04	0.01	0.08	0.20	1.00	FRNR										
FRNR	0.16	0.06	0.07	0.14	0.29	-0.01	1.00	FORGN									
FORGN	-0.03	-0.01	-0.02	0.09	0.02	-0.01	0.19	1.00	INSER								
INSER	0.24	0.01	0.12	0.11	0.24	-0.04	0.39	-0.11	1.00	LEVERAGE							
LEVERAGE	0.36	0.10	0.15	0.16	0.20	0.06	0.19	-0.02	0.16	1.00	LOBRD						
LOBRD	0.09	-0.03	-0.12	0.04	-0.11	-0.01	-0.07	0.00	-0.02	-0.14	1.00	LOGASH					
LOGASH	-0.25	-0.05	-0.35	-0.15	-0.30	-0.05	-0.12	-0.01	-0.16	0.00	0.10	1.00	MBV				
MBV	-0.16	-0.01	-0.14	-0.07	-0.13	-0.03	-0.04	0.01	-0.03	-0.03	0.12	0.33	1.00	PROFIT			
PROFIT	-0.02	0.01	0.17	-0.02	0.06	-0.02	0.02	-0.01	-0.01	0.05	0.00	-0.09	-0.07	1.00	SZE		
SZE	0.28	0.07	0.25	0.19	0.52	0.13	0.52	0.22	0.32	0.39	-0.12	-0.37	-0.24	0.04	1.00	SHREQ	
SHREQ	0.16	0.01	0.09	0.17	0.29	0.25	0.30	0.18	0.23	0.18	0.01	-0.20	-0.05	-0.05	0.59	1.00	VORCAP
VORCAP	-0.06	-0.04	-0.51	0.05	-0.16	0.02	-0.09	0.04	-0.17	-0.26	0.04	0.51	0.14	-0.08	-0.23	-0.11	1.00

variables (Table 4.2). The rule of thumb for being cautious with a variable is if it has a correlation of 0.80 or higher with another variable. Among our variables, we have no such problem, though there is a tendency to high correlation between SIZE-FIRMR, SIZE-SPHEREO, and LOGCASHH-LEVERAGE.

The tested residuals estimated from the standard OLS estimation demonstrate just a slightly skewed and leptokurtic distribution. However, they indicate that both autocorrelation and heteroscedasticity are present. Hence, we chose to perform the regression using a GLS cross-sectional weighting with a white cross-section weighting.

4.3 Result from GLS regression

In the table below, the results from the GLS regression method are displayed with coefficient, standard error term, t-statistic, p-value and relative standard error.

Table 4.3 GLS regression results

	Coefficient	Std. Error	t-Statistic	p-value	Std. Error/ Coefficient
C***	-1,148	0,194	-5,93	0,0000	17%
SIZE***	-0,035	0,013	-2,74	0,0062	36%
MTBV***	0,098	0,011	9,17	0,0000	11%
LEVERAGE***	-3,653	0,147	-24,81	0,0000	4%
CASHF	-0,068	0,099	-0,69	0,4927	146%
WORKCAP***	0,569	0,061	9,39	0,0000	11%
ASSETT***	-0,339	0,083	-4,07	0,0000	25%
PROFIT*	-0,002	0,001	-1,79	0,0729	56%
CAPEX	0,239	0,191	1,25	0,2120	80%
FIRMR***	0,575	0,142	4,06	0,0001	25%
DIV***	-0,311	0,041	-7,49	0,0000	13%
INSIDER**	-0,145	0,073	-1,98	0,0482	51%
SPHEREO**	-0,068	0,034	-2,01	0,0447	50%
LOGBOARDS	0,323	0,221	1,46	0,1439	68%
CEODUAL***	-0,132	0,035	-3,81	0,0001	26%
FOREIGNL***	-0,177	0,056	-3,16	0,0016	32%
DUALS	0,034	0,025	1,39	0,1639	72%
R-squared	0,685				
Prob(F-statistic)	0,000				

Regarding the firm specific variables, we note that size, leverage, asset tangibility, profitability, and dividend are all negatively related to cash holdings and significant on at least the 10 percent confidence level. It can be noticed that the standard error for leverage and dividend are very low, just 4 percent and 13 percent of the coefficient respectively, suggesting that they are very stable. The relative magnitude for the standard error for size and asset tangibility is about 35 percent and 25 percent respectively. The standard error for profitability is about 55 percent. The significant and positive coefficients related to cash holding, on just

about the 1 percent level, is market-to-book ratio, working capital, and firm recognition abroad. The standard errors of these three variables in respect of its coefficient are about 10,10, and 25 percent respectively of the coefficient value.

Regarding the corporate governance variables we find four variables that are significant. These four are insider holdings, sphere ownership, CEO dualship, and foreign listing. All are negatively related to cash holdings on (at least) the 5 percent confidence level. The insider holdings and sphere owned variables have fairly high standard error at about 50 percent. Further, if the CEO is also present on the board of the company, this is expected to have a curbing effect on cash holdings. A firm which has its stock traded on another exchange is expected to hold less cash. Both CEO dualship and foreign listing have a low standard error and are significant on the 1 percent level.

The two variables left, dual share and board size, show a positive relation to cash holdings. However, both variables show no significance, with a considerably high standard error of about 70 percent and only a significance level at around 15 percent.

We can state that from our results (at the 10 percent confidence level) that a firm from our sample with high levels of cash holdings is smaller, holds less debt, holds less fixed assets, is less profitable, than the average firm. Further, such a firm will have lots of growth opportunities (high market-to-book ratio), have a large proportion of its sales abroad (high firm recognition) and have high working capital. Next, a firm with high cash holdings is not expected to pay out a dividend to its shareholders, nor is it expected to be listed on multiple exchanges. Regarding ownership structure, firms with high cash holdings are not expected to be sphere owned, have high insider holdings or have its CEO on the board.

We can conclude from our regression that our model is quite good at explaining cash holdings with an R-square of 68.5 percent.

4.4 Relative comparison of the variables

Before we can draw any extensive conclusions from our regression results it is conclusive to relate each coefficient for the variable in question to its design. If not analysed with this in mind our conclusions will be incorrect. Just as the design needs to be taken into account, as important is how much each variable tend to vary. Therefore we present a table below that will support us in our discussion of the results and later in the analysis.⁵

The table take its start from each and every variable in the 1st percentile, median and 99th percentile in our whole sample. These figures are multiplied with the coefficients retrieved from the regression. These calculated figures are put in relation to the median value of size, which will be used as a bench-mark for the other variables. This leaves us with a ratio that can illustrate the potential effect on the cash holding in relation to other variables. We can now better evaluate the influence each variable could have on the amount of cash a firm holds in a consistent manner. In our reasoning around the results presented in the table we refer to the median values if nothing else is stated.

Table 4.4 Relative impact

	Absolute numbers		Relative numbers			
	Median	1 st percentile	Median	99 th percentile	Mean	
SIZE**	-0,49	0,75	1,00	1,40	1,03	
MTBV***	0,13	-0,08	-0,27	-2,50	-0,39	
LEVERAGE***	-0,62	0,00	1,28	4,52	1,42	
CASHF*	-0,01	-0,25	0,02	0,08	-0,01	
WORKCAP***	0,10	0,37	-0,20	-2,76	-0,32	
ASSETT**	-0,06	0,01	0,12	0,62	0,17	
PROFIT	-0,01	-0,02	0,01	0,01	-0,01	
CAPEX	0,01	0,00	-0,02	-0,14	-0,03	
FIRMR**	0,08	0,00	-0,16	-0,62	-0,21	
DIV**	-0,32	0,00	0,65	0,65	0,39	
INSIDER*	-0,03	0,00	0,05	0,24	0,07	
SPHEREO	0,00	0,00	0,00	0,14	0,03	
LOGBOARDS*	0,15	-0,19	-0,31	-0,45	-0,31	
CEODUAL*	-0,14	0,00	0,28	0,28	0,19	
FOREIGNL*	0,00	0,00	0,00	0,37	0,04	
DUALS	0,04	0,00	-0,08	-0,08	-0,05	

*** = span > 1.5

** = span > 0.5

* = span > 0.2

As can be seen from the table, it is particularly size, leverage, dividend, board size and CEO dualship that have a large effect on the amount of cash that a firm holds. Size has always a great impact, regardless of the structure of the other variables, with a span of 0.65.

⁵ Bear in mind that the assembly of variables in each column does not in any respect represent a “typical firm”. Further, we do not include the intercept which has a high coefficient. A descriptive example of five firms are presented in the appendix which gives an illustration of the impact each variable have on cash holdings in a real firm.

For all variables we note from the 1st and 99th percentile that the span is very diverse. This will lead to a diverse impact on the amount of cash a firm holds. We note that the firm specific variables with the potentially highest impact on cash holdings are leverage, working capital, and market to book ratio respectively. Other variables that can be said to have a potentially high impact on cash holdings is the amount of fixed assets, how much of their sales that occurs abroad, and if the firm pay dividend.

For the corporate governance measures we observe that the impact is fairly limited. The foreign listing variable is the one with the potentially highest effect on cash. The board size measure has quite a high impact as well, but that is to a high extent related to its design (board size divided by log of total assets). Although we see that the corporate governance measures have a fairly limited effect on cash holdings their impact is strictly dependent on the complete structure of the firm. Depending on the impact of firm specific variables, the corporate governance variables increase or decrease of cash holdings in the firm will become of larger or smaller importance. So in a firm which is characterized by low leverage, variables such as insider holdings, CEO dualship, and foreign listing are of higher importance in reducing the amount of cash holdings, than if it was a highly leveraged firm. The opposite of this curbing effect is found for the board size measure, which increases the amount of cash. However, since board size is not statistically significant and has a quite high standard error we are cautious in drawing any conclusions from it.

To summarize the variables with most influence on cash holdings are size, market to book ratio, leverage, working capital, asset tangibility, firm recognition abroad, dividend, CEO dualship, and foreign listing. These have a considerable high span going from first to last percentile.

5 Analysis

In this part we will analyse our empirical findings in the light of the theoretical framework. At first we will determine how our results from the Swedish market differ from previous studies and later we will to analyse what effect corporate governance has on cash holdings to conclude what theoretical and practical implications this has.

5.1 Benchmark analysis

Here we aim to analyse the cash holding behaviour of Swedish firms. We analyse all significant parameters from the regression and compare the results to prior work, especially Drobetz and Grüninger (2007), Ozkan and Ozkan (2004), Dittmar et al. (2008) and Opler et al. (1999).

From the descriptive statistics, we noted that the median Swedish firm is holding a cash ratio level of 10.0 percent. This ratio is similar to Swiss firms in 1995-2004, which according to Drobetz and Grüninger (2007) held 11.4 percent of their assets as cash. Dittmar et al. (2003) report in their study of 11,000 firms from 45 countries that the median firm is holding a cash ratio of 6.3 percent and Opler et al. (2001) finds on a comprehensive sample of US firms in the period 1971-1994 that the median firm holds a cash ratio of 6.5 percent. Although the studies are not entirely comparable, this shows a tendency that cash holdings in Sweden are higher than in other countries. Comparing corporate cash holdings between different nations is complicated as it depends largely on the country's regulatory environment and development of financial markets. However, the finding that Swedish firms hold more cash than firms from other countries is interesting since it suggests that Sweden, being a small country, is affected by cross-border information asymmetries due to geographical separation. Thus, this can be said to be one explanation for the somewhat conservative cash holding behaviour of Swedish firms.

By investigating the significant variables from the regression analysis we note that size, market-to book value, leverage, asset tangibility, profitability and dividend payment all have the expected signs when relating to existing theory and previous research. A larger firm holds relatively less amounts of cash, which is in line with the notion that a larger firm is more diversified and thus facing a lower risk of going into financial distress. Also, it supports the thought that a large firm is more closely watched by investors and media, hence mitigating information asymmetries. The precautionary motive of holding cash is strong for smaller

firms, since they cannot turn to external investors to raise cash quickly. As we can see from Table 4.4, the relative impact of size on cash holdings is very large and thus size is one of the main determinants of how much cash a company holds. The market-to-book value also has a positive relationship to cash holdings which is widely confirmed in previous studies (Opler et al., 2001; Ferreira and Vilela, 2004; Dittmar et al., 2003). The relative impact is large (Table 4.4). Hence, this suggests that we find proof that information asymmetries increase with growth opportunities. Leverage has a negative effect on cash holdings and the relative impact is very large, which is confirmed in earlier research (Opler et al., 2001; Kim et al., 1998; Ferreira and Vilela, 2004). Here, the reason could be that banks play a part in monitoring the company to cut down on excessive cash holdings, trimming down on information asymmetries and agency problems. According to the pecking order theory, high levels of debt and low levels of cash holdings occur simultaneously when firm's investment exceeds retained earnings, which sounds reasonable. The positive relationship with cash and asset tangibility is also in line with previous research (Anderson and Hamadi, 2006). The relative impact is also large (Table 4.4). A firm with a lot of fixed assets can use them as collateral when borrowing, hence decreasing information asymmetries, and as a result lower the transaction cost of raising capital. On the other hand, Opler et al. (2001) suggests that a firm with a lot of fixed assets also invests more, and thus accumulates less cash. However, this does not seem to hold for Swedish firms.

For profitability, there is a negative relationship suggesting that it can act as an immediate source of liquidity and thus as a substitute for cash, which is consistent with Kim et al. (1998). The pecking order theory, as advocated by Opler et al. (1999) and Drobetz and Grüninger (2007), is thereby not confirmed, stating that a profitable firm would use its profits to build up financial slack. However, we note from Table 4.4 that the relative impact of this variable is very small and with an insignificant coefficient, hence we should not draw any extensive conclusions from this variable. A company which pays a dividend is expected to hold less cash, which is intuitively correct and also consistent with previous research (Opler et al., 1999) saying dividend can always cut down on it as a first means of raising cash and thus carry lower amounts of cash on its balance sheet. This reflects the pecking order theory cheap financing since the firm paying a dividend can always raise cash from within before having to turn to the financial markets. However, some previous research have shown that there is a positive relationship between these variables (Ozkan and Ozkan, 2004; Drobetz and Grüninger, 2007), suggesting that dividend paying firms are reluctant to omit the dividend

and thus holding excess cash. Since the relative impact of the variable is large, we can conclude that there is support for the pecking order theory among Swedish firms.

Apart from the variables discussed above, we have found some results that are inconsistent with previous research. Working capital shows a positive relationship to cash holdings, which is opposite to previous research, which argues that working capital should act as a substitute for cash (Opler et al., 1999; Dittmar et al., 2003; Anderson and Hamadi, 2006). For Swedish firms, it looks more like working capital is a complement to cash holdings. One possible reason can be that the firms in our sample keep a lot of cash for operational reasons, which is something we do not take into account in this thesis.

For capital expenditures and cash flow there is no significant effect on cash holdings. Previous studies have shown mixed results for capital expenditures, so our result is not entirely surprising. Further, we believe that agency costs are better captured by other measures and thus we will not discuss this further. Cash flow is more puzzling, since intuitively one would think that it can affect cash holdings in some way. A company with high cash flow could hold less cash since it views it as a complement or it might hold more cash as a consequence of a lot of cash coming in. This indeterminacy can be just what makes this variable insignificant. Further, it can be that the effect is better captured in some other variable included.

An interesting finding among our firm specific variables is that firm recognition abroad is significantly positive, indicating that firms with a lot of sales abroad holds more cash than other firms. International diversification is obviously not encouraging firms to hold less cash, even though one could have assumed so. One theory is that firms with a large share of its sales abroad must hold more cash to finance an international organisation. It can also be that exporting firms experience a risk related to currencies and interest rates and is thus holding excess cash for precautionary motives.

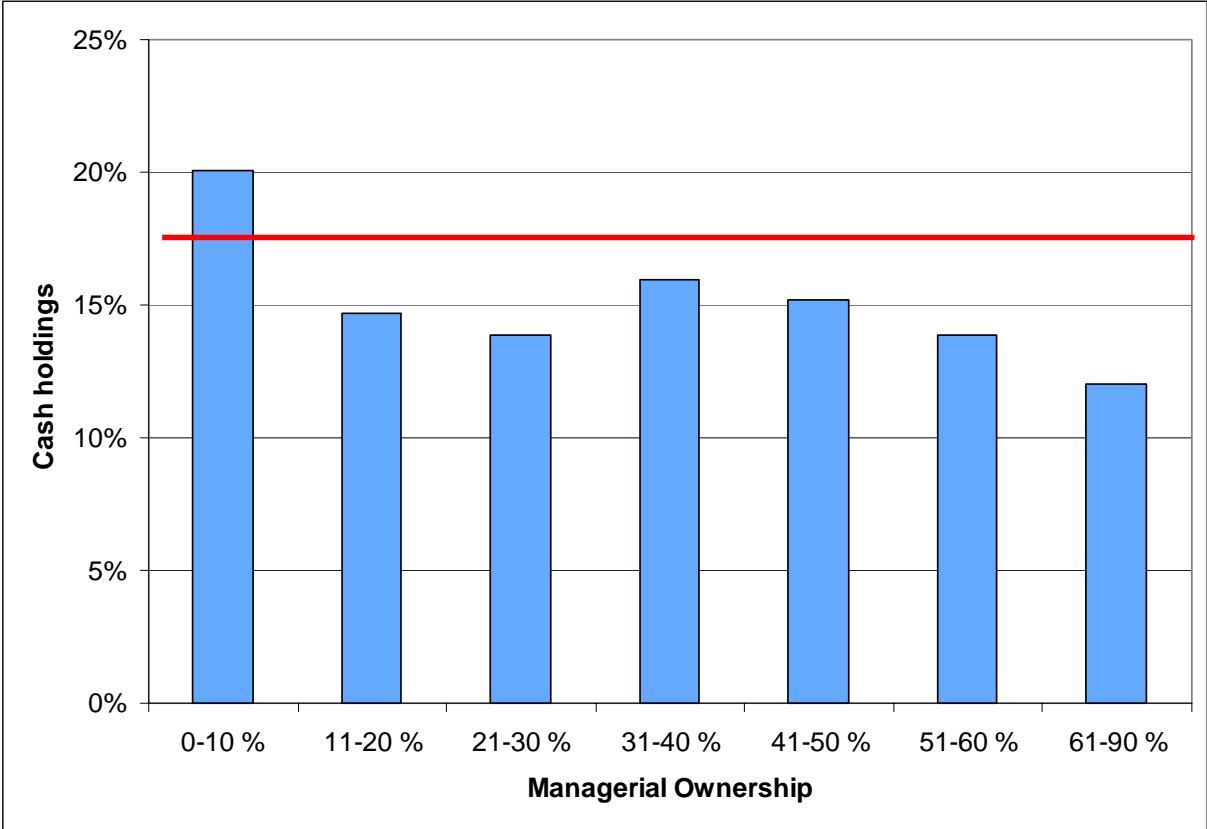
5.2 Corporate Governance and Cash holdings

Now let us turn over to the main focus of this thesis, namely how corporate governance is affecting cash holdings. This is related to the hypotheses stated earlier and thus at the heart of this thesis.

In line with *Hypothesis 1a*, managerial ownership decreases the level of cash holdings (thus we reject *Hypothesis 1b*). This suggests support for the notion that managers who own shares

in the company align their interests with the shareholders. As a result of this, agency costs will be mitigated as managers will act in the best interest of shareholders. This will subsequently lead to improved corporate governance as shareholders gain confidence in management since they are in it together. Previous theory on managerial ownership is conflicting, with management alignment (Drobetz and Grüninger, 2007; Chen, 2008) on one side and risk aversion from management on the other (Anderson and Hamadi, 2006; Harford et al., 2008). Ozkan and Ozkan (2004) suggest that management ownership has a positive effect on cash holdings, but only if the ownership stakes are not large in absolute numbers. Even though it is hard to judge what really is meant by absolute numbers, we modelled this relationship between managerial ownership to total shares and cash holdings to total assets, displayed in Diagram 5.1.

Diagram 5.1 Managerial ownership to cash holdings



The bars represent cash holdings to total assets for different levels of managerial ownership. The red line shows the average cash holdings to total assets for all firms in the sample.

We can not fully confirm the U-shaped relationship, as can be seen in the diagram, but there is a tendency towards it with cash holdings being the lowest when managerial ownership is in the range of 21-30 percent. Thus our results exhibit a similar pattern to Ozkan and Ozkan (2004) and Drobetz and Grüninger (2007).

For family ownership our results show opposite results to *Hypothesis 2*. Corporate cash holdings are actually lower when the company is owned by one of the 11 spheres. This confirms the theory by Schleifer and Vishny (1986), suggesting that a large blockholder is good for shareholders since it performs a monitoring function and reduces the scope for managerial opportunism. Even though the relative impact is very small (Table 4.4), this finding is still of great interest since it contradicts the notion that a family owned firm should be more conservative and tend to promote its own self interest. This is also interesting from the view point that previous studies tend to favour a positive relationship (Ozkan and Ozkan, 2004; Anderson and Hamadi, 2008). One reason for our finding can be related to our method of selecting which ownership spheres to include. Since we have chosen only 11 spheres based on that they should have been around for a long time, this can lead to that many of the sphere owned firms today are also large firms. Looking in Appendix 3, we can see that this is actually the case with the average size of sphere owned firms being significantly larger than the size for the whole mean. Further, when briefing through the list of firms that are sphere owned (Appendix 2), we note many of the largest listed Swedish firms such as Ericsson, H&M, Atlas Copco and Skanska. Since the size of a firm is correlated to sphere owned firms and size being very positively significant to cash holdings, it is not so surprising that the sphere owned firms have lower levels of cash holdings than other firms.

Hypothesis 3 is also rejected, but just as with *Hypothesis 2* we find a significant relationship opposite to what we hypothesised, i.e. a negative relationship between the presence of the CEO on the board and cash holdings. This does not support agency costs of managerial discretion which suggests that a manager will try to keep a large cash cushion to gain discretionary power over the firm's investment decisions. Further, this contradicts theories stating that a board free from CEO intervention makes better decisions, which is also related to agency costs. However, Harris and Raviv (2008) suggest that there might be cases where an insider controlled board is beneficial for shareholders. A possible explanation is that the CEO is one of the persons that know the company best and thus the board will be effective in exploiting valuable inside information provided by the CEO to make more informed decisions. The CEO will probably not delegate any decisions to the board alone if he is not sure that other board members are fully informed. As a result, when the CEO is on the board, this may lead to incentives for outsiders to become more informed and thus leading to more efficient decision making. Consequently, information asymmetries will be mitigated and cash holdings lower.

For *Hypothesis 4*, we chose a double edged approach since previous research has been contradicting. Surprisingly, we find no significance for neither *Hypothesis 4a* nor *Hypothesis 4b*, suggesting that board size is of no importance for a firm's cash holdings. However, there is a tendency towards that a larger board leads to higher levels of cash holdings. This would suggest that ineffective decision making and decreased monitoring occurs in a company with a large board, but since the results are not significant we are not going to elaborate any further on this.

Hypothesis 5 has to be rejected too, suggesting that there is no evidence that the system of dual class shares has an effect on corporate cash holdings. This suggests that the discussion in the media regarding dual class shares and the impact on corporate governance is widely hyped, at least when using excess cash holdings as a measure of good corporate governance. However, we cannot exclude that dual class shares are of importance for other decisions regarding a company, but that will not be further discussed here.

Foreign listing of the firm's shares is associated with less cash holdings, confirming *Hypothesis 6*. The relative impact of this variable is large. This finding confirms the notion that firms with listing on foreign capital markets experience a decrease in information asymmetries and agency problems. Further, firms with listing in important financial centres may use this as an attempt to mitigate cross-border information asymmetries. The company thus reaches an additional capital market including banks, funds, and other investors, thus potentially lowering the transaction costs for raising cash. Also, the precautionary motive for holding cash will not be as important, since the company can be able to raise cash more quickly if an investment opportunity would arise. Most firms that are listed abroad are also large firms, indicating that size is playing an important role for these firms in determining their levels of cash holdings. Even though fewer firms today get listed abroad than 1980, our data suggest that this factor has an effect on cash holdings and subsequently on information asymmetries. Important to note though, is that from our sample we cannot determine if international financial integration has had a significant impact on cash holdings.

6 Conclusion

This study contributes to the literature by giving an in-depth analysis of the characteristics of cash holdings among Swedish firms. Our results show that the cash holding behaviour of Swedish firms differ from that of firms from other countries. On a sample of 154 firms and 1368 firm-year observations over a period of ten years, we find that Swedish firms hold more cash than their international counterparts. Although it is difficult to compare the levels of cash holdings between countries, one reason for cash holdings being higher in Sweden can be related to cross-border information asymmetries.

Consistent with earlier studies and theoretical expectations we find that size, market-to-book value, leverage, asset tangibility, profitability, and dividend payment all are significantly related to cash holdings. Size, market-to-book-value, and leverage have particularly large impact on cash, which is proved through a relative comparison of the variables. The findings support theories regarding information asymmetries and agency problems.

We find proof that managerial ownership indeed aligns interest with shareholders, thus having mitigating effect on cash holdings. An important theoretical implication of this is that management ownership improves corporate governance in Sweden. A practical implication of this is that boards can encourage managers to own shares (e.g. through an option program) to improve corporate governance. However, managerial ownership tend to have a positive effects on cash holdings when it gets larger than a certain level, indicating that managers get risk averse as their wealth gets tied up into the company. Family ownership is proved to reduce cash holdings, which is contrary to what was believed on beforehand. However, we have to be careful when drawing conclusions from this since many family owned firms are also to high extent large firms. Further, if the firm has its shares listed at another exchange, this has a decreasing effect on cash holdings, suggesting that access to other capital markets will decrease the firm's cost of raising cash. This means that even though financial markets have integrated lately, foreign presence still gives an advantage in raising cash.

In contrast to previous studies, we provide evidence that CEO presence on the board does not lead to increased agency costs. In fact, it has a decreasing effect on cash holdings among Swedish firms and a possible explanation can be that this structure eases the information flow from the CEO to the board. Also contrary to what we hypothesised, we find no evidence for that the board size or dual class shares has an effect on cash holdings. Thus, we claim that the

debate regarding dual share holdings and its effect on corporate governance is largely overrated, at least when considering the impact of cash holdings.

So is it viable to draw any conclusions from the results stated above? Well, as stated earlier, corporate cash holdings are generally very difficult to compare between different countries due to country-specific differences regulations and taxes. However, we believe our findings have provided some important insights into the topic. Even though this study does not determine what defines good or bad corporate governance, it suggests that the cash holdings of Swedish firms are affected by different corporate governance variables, but not necessarily in the way we would have expected in advance.

6.1 Criticism of research

Even though our study shows some interesting results and unique findings in the topic of corporate cash holdings, we feel that with more time, the study could have been improved in some aspects. First, since we have not calculated an optimal level of cash holdings we cannot say that a company holds too much or too little cash. In some cases excess cash holdings may not be disadvantageous. In a growth company for example, good corporate governance may be to push for excess cash holdings. This problem is related to the fact that we have not divided the sample into industries. Second, the variable related to family ownership could have been refined to further reflect family firms. Since we have only looked at spheres, we have not incorporated the fact that there might be a lot of smaller firms which indeed are owned by families, even though these families are not so publicly well-known. With a more comprehensive definition of family ownership, and a larger sample window, say 30 years, the results might have turned out differently. However, we believe that the purpose of the study has been phrased in such a way that the reader has understanding of these shortcomings.

6.2 Suggestions for further studies

The topic of corporate cash holdings is still in many aspects unexplored. Even though we have provided the first focused study on this topic on the Swedish market, there are many potential research topics that can be undertaken by future researchers. We particularly think the following topics would be of great interest:

- One could expand the sample to include firms from a wider geographical area, for example the whole Nordic area, to get a more comprehensive sample. The common

characteristics of many Nordic firms and the similar regulatory body would make this a feasible area to group together in one study.

- One could conduct a qualitative study on companies that are extreme in any sense when it comes to holding cash. There are a number of examples of firms from the U.S., e.g. Microsoft, which are famous for just keeping a large pile of cash. What are the underlying reasons for this? What do shareholders/regulators/analysts think about this?
- One could construct a corporate governance index based on shareholder protection rights, tax burden, and other variables to be able compare cash holdings of firms from different countries in an effective manner.
- One could group the firms in the sample into industries or growth versus mature firms and adjust the regressions accordingly.

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Appendix

Appendix 1 Structure of unbalanced data

Year	Number of firms
1999	93
2000	121
2001	135
2002	148
2003	150
2004	154
2005	152
2006	152
2007	144
2008	119
Total observations	1368

Appendix 2 Sphere owned firms

ACTIVE BIOTECH	ERICSSON	MIDELFART SONESSON	SECURITAS
ASSA ABLOY	FAGERHULT	MODERN TIMES GROUP	SKANSKA
ATLAS COPCO	GETINGE	NCC	SKF
AXFOOD	HENNES & MAURITZ	PEAB	SKISTAR
CARDO	HEXAGON	SAAB	SSAB
ELANDERS	HOLMEN	SCA	SWECO
ELECTROLUX	MEDA	SCANIA	TELE2

Appendix 3 Corporate governance descriptive statistics

	Insider owned	Sphere owned	Board size 3-6	Board size 7-10	CEO on board	CEO not on board	Sample mean
LOGCASHH	-2,28***	-2,72***	-2,02**	-2,28***	-2,34***	-1,75***	-2,14
CASHH	14,02%***	9,41%***	18,04%**	14,78%**	14,27%***	20,74%***	16,44%
SIZE	15,06***	16,63***	13,12***	15,146***	14,42***	13,51***	14,12
MTBV		1,64**			1,75**	2,16***	1,88
LEVERAGE	20,45%***	23,79%***	17,27%**	20,26%**	20,72%***	14,83%***	18,75%
CASHF	1,38%*	8,64%***					-1,59%
WORKCAP	18,22%***	12,32%***	30,42%**	22,66%*			26,60%
ASSETT	25,44%***	28,38%***	1,853%***	27,71%***	25,69%***	17,81%***	23,06%
PROFIT	-4,19%**	8,15%***					-11,40%
CAPEX		5,58%**	4,25%**	5,29%**	5,18%**	3,94%***	4,78%
FIRMR	26,27%***	28,47%***	11,61%***	22,85%***	19,06%***	13,43%***	17,19%
DIV	71,31%***	90,07%***	47,43%***	73,23%***	70,15%***	40,22%***	60,16%
INSIDER		30,82%***	17,18%***	25,04%***	22,97%**	17,25%***	21,06%
SPHEREO	29,62%***		7,02%***	33,68%***	24,83%***	10,88%***	20,18%
LOGBOARDS			0,41***	0,51***			0,46
BOARDS	6,87***	7,65***	5,32***	7,67***	6,67***	6,11***	6,48
CEODUAL	72,13%***	81,96%***	58,86%***	74,59%***			66,62%
FOREIGNL	11,03%*	21,69%***	5,95%***	13,53%***	11,47%**	6,20%**	9,72%
DUALS		90,07%***			70,15%**	62,22%**	67,51%
N	873	273	694	674	913	455	1368

The table present the mean values for the six different groups, insider owned, sphere owned, board size 3-6, board size 7-10, CEO on board, and CEO not on board. The mean figures are tested with a t-test to determine if it is significantly different from the sample mean. Values in **bold** indicate that the value is higher than the sample mean. Subscripts ***, **, * indicate significance at the 1 percent, 5 percent, and 10 percent.

Appendix 4 Descriptive statistics over five firms

	SINTERCAST - 07 1 st percentile	DUROC - 99 1 st Quartile	AXIS - 07 Median	HÖGANÄS - 07 3 rd Quartile	TELIASONERA - 07 99 th percentile
LOGCASHH	0,32	-0,68	-0,32	-3,15	-3,10
CASHH	58,01%	33,71%	42,01%	4,10%	4,33%
SIZE	10,25	12,57	13,73	15,45	19,14
MTBV	27,95	1,79	12,45	1,17	1,54
LEVERAGE	0	11,65%	0,62%	21,57%	21,16%
CASHF	-28,81%	5,27%	13,75%	9,80%	1,73%
WORKCAP	92,37%	63,16%	57,80%	29,23%	-1,78%
ASSETT	0,85%	56,52%	4,57%	48,00%	26,86%
PROFIT	-22,37%	-1,93%	21,59%	9,59%	20,14%
CAPEX	0,33%	37,86%	1,87%	3,37%	7,22%
FIRMR	0	0	26,06%	27,99%	31,29%
DIV	0	0	1	1	1
INSIDER	0	0	44,10%	32,48%	51,01%
SPHEREO	0	0	0	0	0
LOGBOARD	0,49	0,40	0,36	0,58	0,37
BOARDS	5,00	5,00	5,00	9,00	7,00
CEODUAL	1	1	0	1	0
FOREIGNL	0	0	0	0	0
DUALS	1	1	0	1	0

Each firm represent a percentile, ranging from the 1st to 99th, sorted by size in our whole sample. As can be noted in the diagram the firms are very different in their structure. However, two variables are not captured by these firms namely if it is sphere owned or foreign listed.

Appendix 5 Relative impact for the five firms

	SINTERCAST - 07 1st percentile	DUROC - 99 1st Quartile	AXIS - 07 Median	HÖGANÄS - 07 3rd Quartile	TELIASONERA - 07 99th percentile
C	3,19***	2,6***	2,38***	2,12***	1,71***
SIZE	1.00	1,00	1,00	1,00	1.00
MTBV	-7.63***	-0,4*	-2,54***	-0,22*	-0.23*
LEVERAGE	0.00	0,97**	0,05	1,45**	1.15**
CASHF	-0.06	0,01	0,02	0,02	0.01
WORKCAP	-1.46**	-0,82**	-0,69**	-0,31*	0.02
ASSETT	0.01	0,44*	0,04	0,30*	0.14
PROFIT	-0.01	-0,01	0,01	0,01	0.01
CAPEX	-0.01	-0,21*	-0,01	-0,02	-0.03
FIRMR	0.00	0,00	-0,32*	-0,30*	-0.27*
DIV	0.00	0,00	0,65**	0,58**	0.47*
INSIDER	0.00	0,00	0,14	0,09	0.11
SPHEREO	0.00	0,00	0,00	0,00	0.00
LOGBOARDS	-0.44*	-0,3*	-0,25*	-0,35*	-0.18
CEODUAL	0.37*	0,30*	0,00	0,25*	0.00
FOREIGNL	0.00	0,00	0,00	0,00	0.00
DUALS	-0.10	-0,08	0,00	-0,07	0.00

*** impact on cash > 1.5

** impact on cash > 0.5

* impact on cash > 0.2

In the table above we illustrate the relative impact in respect to the size each variable has on cash holdings. As noted Sintercast is highly affected by the market to book value and working capital which is increasing cash while the coefficient, size, the board size measure and that the CEO is present on the board is reducing cash. In the case with Höganäs their cash holdings are highly affected by their coefficient, size, leverage, and dividend. To a lesser extent cash holdings is related to the asset tangibility, managerial ownership and that the CEO is present on the board which all are reducing cash holdings. The market to book value, working capital, firm recognition abroad, board size and dual share are increasing cash.

Appendix 6 Calculated cash holding using our model for the five firms compared to actual holding

	SINTERCAST - 07	DUROC - 99	AXIS - 07	HÖGANÄS - 07	TELIASONERA - 07
Calculated CASHH	634,16%	21,13%	79,68%	8,49%	7,32%
Actual CASHH	58,01%	33,71%	42,01%	4,10%	4,33%

Above we present the amount of cash each firm is expected to hold given its structure. We also present the amount of cash they actually hold as a comparable figure.