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Corporate Cash Holdings:
Determinants and the Impact of Corporate Ownership
Insights from the Stockholm Stock Exchange

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Abstract

This paper investigates two facets of corporate cash holdings in firms listed on the Stockholm Stock Exchange over the period 2001–2020. Firstly, I examine the determinants of corporate cash holdings. I find that firms with more investment opportunities and smaller firms tend to hold more cash. Firms with controlling shareholders and firms with high institutional block holdings tend to hold less cash. The effect of controlling shareholders is more pronounced when the controlling shareholder is a family.

Secondly, I explore the impact of excess cash and corporate ownership on firm valuation. My results indicate that excess cash is more valuable in firms with controlling shareholders, and the effect is more pronounced in institutional-controlled firms. Excess cash does not have a significant impact on firm valuation in firms with dispersed ownership. When controlling for types of ownership, I observe that the impact of excess cash on firm valuation is significant when the relationship between investment decisions and firm valuation is insignificant. This indicates that capital markets view excess cash as valuable in firms with controlling shareholders because they perceive that investments performed by these shareholders are allocated ineffectively, possibly due to the consumption of private benefits of control. The negative impact of capital ownership is marginally less severe in firms with controlling shareholders. Unlike previous research, I do not find a significant relationship between excess control and firm valuation.

Future research should explore the true value of private benefits of control, not the value reflected by the capital markets.

Keywords: Corporate Cash Holdings, Corporate Governance, Corporate Ownership, Excess Cash, Firm Valuation, Private Benefits of Control.

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1. Introduction

Across the globe, researchers have noted a secular increase in corporate cash holdings. Firms listed on the FTSE 100 recorded a rise of almost 200 percent in cash holdings from 2000–2014 (Deloitte, 2014). Bates et al. (2009) report that cash in proportion to assets has more than doubled from 1980 to 2006 for industrial firms in the United States, i.e., about an annual increase of 0.5 percent. In 2023, 13 American firms alone had cash savings worth an astonishing US\$1 trillion, about four percent of the United States total GDP (Krantz, 2023).

The growing prominence of corporate cash holdings has spurred the interest in academic research in recent years to investigate various aspects of cash holdings and their consequences on firm behavior. One of the leading fields in corporate cash holdings literature is its relation to corporate governance and ownership structures. How ownership structures affect the behavior of the modern firm was first expressed by Adam Smith in 1776:

The directors of [widely held] companies, however, being the managers rather of other people's money than of their own, it cannot well be expected that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such compan[ies] (Smith, 1937, p.700).

What Smith refers to would later be known as agency theory, implying the conflict of interest between actors in the firm created by the separation of control and capital ownership. In the quote, Smith is alluding to the principal-agent conflict that arises between managers and shareholders due to the self-serving incentives of managers, which inclines them to pursue their interests over the shareholders. Over time, researchers noticed a shift in agency problems. The discussion was becoming more catered around concentrated ownership. The rise of concentrated ownership was popularized by the works of Shleifer and Vishny (1986), who voiced early on that concentrated ownership is a solution to mitigate managerial opportunism and realign the interests of shareholders and managers. Concentrated ownership implies the control of a firm is concentrated in the hands of a few shareholders. Shleifer and Vishny argue that these controlling shareholders are more inclined to actively engage in the firm by collecting information and effectively monitoring managerial decisions due to the high capital ownership of the firm. However, the concentration of ownership by itself creates problems. Beyond improving the governance in firms, controlling shareholders are also incentivized to pursue their interests over the interests of minority shareholders and managers. The incentives are typically referred to as private benefits; in some cases, these benefits will imply expropriation of minority shareholders. Firms need other types of adequate corporate governance to mitigate this potential exploitative behavior, such as strong legal protection for minority shareholders and appropriate ownership structures.

1.1. Problem discussion

This paper examines two facets of corporate cash holdings. Firstly, I investigate corporate cash holdings and their determinants and how cash holdings vary depending on types of ownership and ownership structures. Secondly, I explore the impact of excess cash and corporate ownership on firm valuation. The paper is mainly aimed at investigating the effect of controlling shareholders. With financial literature predominantly based on studies performed in

the United States and the United Kingdom, some researchers have emphasized conducting investigations in domestic regions to deepen our understanding of corporate governance and cash holdings (see, e.g., Panda & Leepsa, 2017). Thus, my study is conducted on firms listed on the Stockholm Stock Exchange, henceforth SSE, over the period 2001–2020.

The specific interest in corporate cash holdings arises from two primary reasons. Firstly, cash is easily accessible for managers and has full discretion over its allocation (Jensen, 1986), and controlling shareholders who have uncontested control over the firm effectively control the managers and the allocation of cash holdings (Shleifer & Vishny, 1997). Secondly, cash has the lowest conversion rate into private benefits compared to other assets (Attig et al. 2013; Myers & Rajan, 1998). Although cash is needed to fund the daily operations and to provide a buffer for the future, it – especially excess cash – can be allocated ineffectively by controlling shareholders and managers to gain private benefits, leading to a negative impact on firm valuation (Dittmar & Mahrt-Smith, 2007).

Examining the relationship between corporate governance and cash holdings in the Swedish market compared to, for example, the American market is underscored by two additional reasons. Firstly, the high concentration of ownership in Sweden. La Porta et al. (1999) observe that 65 percent of the 20 largest in Sweden have controlling shareholders, while only 20 percent in the US. In an extensive study by Agnblad et al. (2002), they discover that families control 61.8 percent of firms on the SSE and that the largest shareholder controls on average (median) 37.7 (35.0) percent of the total control ownership of the firm. They further explain how prevalent the control of families is in Sweden when discovering that approximately 50 percent of the total market value of the SSE is controlled by one family – the Wallenberg family.

Secondly, the inconclusiveness regarding Sweden's investor protection of minority shareholders. Some papers categorize Sweden as a country with high investor protection (Dittmar et al. 2003); with a strong corporate legal system that protects minority shareholders through pre-emption rights and the ability to request minimum dividends and special examiners (Confederation of Swedish Enterprise, 2023; henceforth, CSE); and generally favorable governance in terms of anticorruption and low political risk (Dyck & Zingales, 2004; Pinkowitz et al. 2006). Meanwhile, Others classify Sweden as a region with low shareholders' rights (La Porta et al. 1999, 2002, 2000) and weak investor protection (Institutional Shareholder Services, 2007). Based on La Porta et al. papers, Cronqvist & Nilsson (2003) elaborate that the Swedish corporate law aims to protect controlling shareholders rather than minority shareholders by allowing a wide range of control mechanisms to expropriate minority shareholders. Additionally, somewhat contradicting the CSE's statement, Armour et al. (2009) report that common law, the legal system used in the United States, provides better investor protection than civil law, the legal system used in Sweden. However, Sweden is not included in their study.

Although the empirical evidence points to Sweden as a favorable environment for controlling shareholders to consume private benefits and expropriate minority shareholders (see Adams & Ferreira, 2008; Agnblad et al. 2002; Cronqvist & Nilsson, 2003; Dyck & Zingales, 2004) the main academic opposition to this view are two studies by Bergström and Rydqvist (1990a, 1990b). Bergström and Rydqvist examine the utilization of shares with differential voting rights by controlling shareholders to gain excess control and pursue wealth extraction of minority shareholders. Both studies conclude that there is no evidence supporting the association between controlling shareholders and wealth expropriation. The CSE also states in their report that there is no empirical evidence of a negative association between shares with differential voting rights and firm valuation.

Apart from the research by Bergström and Rydqvist (1990a, 1990b) and the statement from the CSE, one might expect Sweden, with its concentrated ownership and investor protection, to result in weak financial markets and firms with poor performance compared to regions with better corporate governance. However, this is not the case; Sweden has outperformed the

United States and the EU countries in terms of economic growth and stock market performance. In 1993—2010, Sweden's GDP grew by an average rate of 2.5 percent annually and GDP per capita growth of 2.0 percent. During the same period, 50 of the largest companies of the SSE generated an average total return of 17 percent annually, trumping the performance of the United States and Germany with 11 and 12 percent (McKinsey & Company, 2013). What can explain Sweden's prosperous growth? Agnblad et al. (2002) propose that in Sweden, controlling shareholders do not consume private benefits to the extent they are ample because the poor, formal corporate governance is supported by strong informal mechanisms, such as the controlling shareholders' concerns over their social status.

Additionally, in a letter to the European Commission, five of Sweden's largest investment firms defend the Swedish corporate governance structure and states: “The ultimate purpose of the corporation is to create value for the owners ... and the owners can hold the board and management accountable.” (Investor AB et al. 2020, p.2) and suggests the corporate governance model has played a pivotal role in enabling the controlling shareholders to stay at the forefront of long-term value creation and provide transparency to ownership, responsibility, and accountability. Moreover, in response to the new recommendations to shareholders to stop voting for directors and executives who promote control devices by the Institutional Shareholder Services (2007), the CSE defends the importance of shares with differential voting rights – the most prominent control device used in Sweden. The CSE explains that shares with differential voting rights are needed to facilitate long-term investing while maintaining high liquidity for securities in order to attract a wide range of potential investors effectively.

Despite the letter by Investor et al. (2020), the response by the CSE, and the evidence from (Bergström & Rydqvist, 1990a, 1990b), and the economic growth one might expect that the corporate governance and expropriation of minority shareholders is nothing to worry about in Sweden. Still, I perceive the independence and objectivity of these claims may be compromised. As earlier reported, the Wallenberg family controls about 50 percent of the Swedish capital markets. They are the founders and largest shareholders of Investor AB, with family members serving as chair and vice chair of its board. A member of the family is the president of the CSE, and they are among the largest donors to the Stockholm School of Economics, where Bergström and Rydqvist are professors. Therefore, this paper targets whether these claims regarding controlling shareholders and Swedish corporate governance are valid or just a mere pretext used by controlling shareholders to stay in control and expropriate minority shareholders.

The remainder of the paper follows: Section 2 discusses the motives explaining why firms hold cash. Section 3 contains sample selection, variables, and descriptive statistics of the sample. Section 4 reveals the regression results and analysis of determinants of corporate cash holdings. Section 5 contains the regression results and analysis of the impact of corporate ownership and excess cash on firm valuation. Section 6 consists of the conclusions and addresses future research.

2. Why Firms Hold Cash

To investigate the determinants of corporate cash holdings, I first discuss how corporate cash holdings are determined. Assuming managers act in the best interest of shareholders, i.e., maximizing the shareholders' wealth, the optimal cash holding is the intersection where the marginal cost and marginal benefit of cash are in equilibrium (Opler et al. 1999). Keynes (1936) proposed two preliminary motives that explain the marginal cost and marginal benefit of cash early on in this field of research: transaction costs and precautionary motive. However, these motives are based on the axiom that the trade-off between marginal cost and marginal benefit of cash is constant across all actors. This neglects the fact that the cost and benefit of cash are viewed differently across actors (Opler et al. 1999). From this discrepancy, agency

theory emerges. Agency theory explains why firms hold more or less cash than what is expected to maximize shareholder wealth. In this section, I will review theoretical and empirical evidence of how these motives – transaction costs, precautionary, and agency – can explain corporate cash holdings.

2.1. Transaction costs motive

The transaction costs motive explains that firms hold cash to mitigate the need to incur transaction costs from selling assets in place or accessing external capital markets in order to meet financial obligations (Opler et al. 1999). Keynes (1936) proposes that the optimal level of cash is determined by the intersection between the marginal cost of liquid assets and the marginal cost of shortage of liquid assets, with liquid assets referring to non-cash assets that are easily converted into cash. The former refers to the cost of holding one more unit of cash, i.e., the liquidity premium, and the curve is constant because the liquidity premium is unaffected by the amount of cash one holds. The latter curve is decreasing and refers to the need to cut back dividends or investments in growth opportunities or raise new cash by selling assets or accessing capital markets to meet the obligations, thus incurring transaction costs. The marginal cost of liquid assets can be interpreted as the likelihood of being short of cash, which decreases since the probability of shortage decreases as the amount of cash at hand increases. Therefore, optimal cash holding can be interpreted as the level of cash where the firm does not need to incur transaction costs to meet financial obligations and is not too large, which results in significant opportunity costs.

Opler et al. (1999) argue that the transaction motive explains cash holdings to be affected by several variables, such as investment opportunities and costs of external financing. However, I use a different approach. I use firm size as the only variable of the transaction costs motive and classify the other variables under the precautionary motives. Miller and Orr (1966) provide theoretical proof of economies of scale in cash management, and research by Mulligan (1997) corroborates this with empirical evidence of the negative association between firm size and transaction costs. Furthermore, empirical support of economies of scale in transaction costs is well established in the financial literature (Bates et al. 2009).

Hypothesis 1: Large firms will hold less cash.

2.2. Precautionary motive

The precautionary motive states firms hold cash to cope with adverse shocks and pursue growth opportunities when external financing is costly. The pecking-order hypothesis developed by Myers and Majluf (1984) supports the theoretical framework for this motive. The hypothesis explains why managers, under information asymmetries, might be encouraged to forgo investments in growth opportunities if funds are raised through external capital markets. Derived from the pecking-order hypothesis is the financing hierarchy – internal financing > debt issues > equity issues – and states the managerial preference for financing. Internal financing refers to internal cash holdings to finance investment opportunities and is preferred over debt and equity. The pecking-order hypothesis predicts that firms with costly external funding and more growth opportunities will hoard more cash than other firms, *ceteris paribus*.

Empirical evidence for the pecking-order hypothesis and the precautionary motive was explored by Opler et al. (1999). In their study of publicly traded firms in the United States during the period 1971–1994, they observe that firms with more growth opportunities, measured as market-to-book value of assets and research and development expenses, and poor access to capital markets, such as small firms and those with low credit rating, hold more cash.

They also find a significant positive relationship between idiosyncratic risk and corporate cash holdings. Bates et al. (2009) find corroborating evidence in a similar study in the United States. They observe a secular increase in the cash ratio and argue the increase is due to increased cash flow volatility, increased research and development expenses, and fallen inventories and capital expenditures over the sample period. Furthermore, they point out that the increase in cash holdings is more pronounced in non-dividend paying firms and firms in industries with high idiosyncratic risk. To investigate the cash holdings and precautionary motive further, Han and Qiu (2007) examine this relationship concerning financial constraints. Four indices – dividends, firm size, bond rating, and commercial paper rating – distinguish between financially constrained and unconstrained firms, where firms with high indices are classified as unconstrained. They unanimously find that a significant positive relationship exists between cash holdings and idiosyncratic risk in financially constrained firms. Meanwhile, for unconstrained firms, no significant relationship exists.

Hypothesis 2: Firms with more growth opportunities, high idiosyncratic risk, high research and development expenses, low capital expenditures, poor access to capital markets, and/or non-dividend paying will hold more cash.

2.3. Agency motives

The agency motives discussed in this section stem from the conflicts between different actors, which depend on the firm's ownership structure. I distinguish between two agency conflicts that can arise within the firm. The first agency motive refers to the conflict between managers and shareholders, which occurs due to the separation of control and capital ownership, and the second relates to the conflict between controlling shareholders and minority shareholders, which arises from the concentration of control and capital ownership.

2.3.1. Separation of control and capital ownership

As Smith proposed in 1776, the separation of control and capital ownership creates an agency conflict between the managers and shareholders, which occurs in firms with dispersed ownership. The conflict arises due to the misalignment of interests between the actors. Although shareholders delegate their wealth and control of the firm to the managers under the assumption that managers will pursue the interests of the shareholders, Jensen and Meckling (1976) explain that it is doubtful that the value-maximizing behavior of the actors will align. Shleifer and Vishny (1997) argue that managers solely view investors as a device to gain capital. Once the shareholders have departed from their capital, they bring little to no additional ability to improve the performance of the firm. One might thereby argue that managers would solely pursue self-seeking interests independent of the interest of shareholders. A typical response to the argument is that managers are required to maintain the interests of shareholders in order to secure future financing (Shleifer & Vishny, 1997).

To explore the effect of separation of control and capital ownership on corporate cash holdings, I separate theories into two realms: cash holding incentives and cash spending incentives.

2.3.1.1. Cash holding incentives

This field consists of theories explaining why firms hold more cash than expected. The two most regarded hypotheses in the field are the flexibility hypothesis and the shareholder power hypothesis. The flexibility hypothesis assumes self-interested managers are risk-averse and hoard cash because they prefer future financial flexibility over pursuing current investment (Jensen, 1986) – enforcing excess cash holdings. When these managers generate

excess cash flow, they prefer to stockpile it rather than spend it. However, shareholders view large cash holdings as an opportunity cost and prefer managers to disgorge the excess cash (Jensen, 1986). In firms with dispersed control ownership, the shareholders' ability to enforce such actions on the managers depends on their degree of coordination. If shareholders cannot coordinate, the managers will gain effective control of the allocation of cash (Jensen, 1986). Thus, the flexibility hypothesis predicts corporate cash holdings negatively correlate with the shareholders' control ownership and coordination ability.

Moreover, the flexibility hypothesis can also be viewed as an incentive to increase managerial power and the firm's competitiveness. The former is proposed by (Jensen, 1986), who argues cash holdings are interchangeable with managerial power. Since managers have easy access to cash and complete discretion over the allocation of it, it can effectively be interpreted as their power. The latter is described as the cash holdings allowing firms to gain competitive advantages, such as undertaking more investment opportunities or winning technological races (Amess et al. 2015).

The shareholder power hypothesis is based on the intuition of the pecking-order hypothesis; shareholders do not suffer from coordination problems and have effective control over the managers. However, shareholders prefer to avoid forgoing investment opportunities and thereby support large cash holdings.

Hypothesis 3a: Firms with dispersed control ownership will hold more cash.

2.3.1.2. Cash spending incentives

The spending hypothesis is typically the leading theory explaining low excess cash (Harford et al. 2008). The hypothesis is commonly referred to as Jensen's (1986) free cash flow hypothesis and is the opposite of the flexibility hypothesis. Self-interested managers with large cash holdings are incentivized to spend excess cash on investments, regardless of whether the investment benefits the firm. A suboptimal investment is, for example, increasing the firm beyond its optimal size to improve managers' control or compensation package (Jensen, 1986; Jensen and Meckling, 1976). Opler et al. (1999) further argue that this self-interested behavior is more pronounced when managers are entrenched. However, the spending hypothesis becomes trivial when firms only have net present value positive investment opportunities (Opler et al. 1999).

Hypothesis 3b: Firms with dispersed ownership will hold less cash.

2.3.2. Concentration of control and capital ownership

Shleifer and Vishny (1997) argue that the fundamental agency problem in the modern firm does not arise from the conflict between managers and shareholders but rather the conflict between controlling and minority shareholders. Controlling shareholders is created by allowing shareholders to concentrate capital ownership in a firm. It is an effective measure to mitigate the opportunistic behavior of managers since these shareholders have incentives to monitor the managers and reduce coordination problems (Shleifer and Vishny, 1986). Similar to the separation of control and capital ownership, this creates new agency problems.

A fundamental problem with large shareholders is that they, like managers, represent their own interests and agendas. As Shleifer and Vishny (1997) describe, large shareholders can maximize their wealth by making corporate decisions that alter the redistribution of wealth from proportional to the capital invested to more favorable terms. The methods used to reallocate wealth are either efficient or inefficient for the minority shareholders. The former entails decisions that redistribute wealth disproportionately more to the controlling shareholders,

while the minority shareholders gain the residual wealth. For example, the controlling shareholder negotiates a deal with a firm in which he has significant capital ownership, but yielding lower production costs for the firm. The latter refers to straightforward wealth extraction of minority shareholders, such as pursuing suboptimal investments or simply withdrawing corporate funds (Fama & Jensen, 1983). Wealth extraction becomes more severe when the investor protection of minority shareholders is weak (La Porta et al. 1999). In such conditions, controlling shareholders with uncontested control over the firm are incentivized to expropriate minority shareholders by transferring wealth out of the firm into their own pockets (Dyck & Zingales, 2004). Pinkowitz et al. (2006) argue that it is the mission of minority shareholders to realign the controlling shareholders' interests with their own to avoid wealth extraction. This wealth extraction of minority shareholders is part of the private benefit of control.

The yearly work of Stulz (1988) and Morck et al. (1988) created the foundation for the research on the impact of controlling shareholders. Stulz (1988) illustrates an inverted U-shaped relationship between firm value and control ownership. Consequently, Morck et al. (1988) explore the relationship between capital ownership and profitability and find that profitability increases within the range of zero and five percent capital ownership and subsequently falls beyond that point. One interpretation is that increased capital ownership creates ample opportunities for large shareholders to enjoy the private benefit of control. Harford et al. (2008) consistently document that the controlling shareholders with an active role in the firm's operations are more prone to the private benefit of control. Moreover, Cronqvist and Nilsson (2003) report that capital ownership of controlling shareholders is associated with decreasing firm valuations.

However, the financial research view of controlling shareholders is not all conclusive. Controlling owners are typically viewed as informed investors with long-term horizons (Courteau et al. 2017). Bergström and Rydqvist, 1990a, 1990b) report that Swedish controlling shareholders have more capital ownership than necessary to maintain uncontested control of the firm. They perceive this as evidence of controlling shareholders having other economic motives than a genuine lust for power. La Porta et al. (1999) and Claessens et al. (2002) conclude that despite the ability of controlling shareholders to expropriate minority shareholders, the capital ownership of the controlling shareholders has a mitigating effect on the incentive to expropriate. The presence of controlling shareholders has a positive association with the value of excess cash (Attig et al. 2013).

Despite the absence of consensus concerning the impact of capital ownership of controlling shareholders on corporate cash holdings, the overall research points to a negative association between capital ownership, and controlling shareholders, and cash holdings. In the following section, I discuss three characteristics where the likelihood of wealth extraction of minority shareholders is exaggerated.

Hypothesis 4a: Firms with shareholders with high capital ownership will hold less cash.

2.3.2.1. Investor protection

In the absence of adequate regulatory and legal enforcement, controlling shareholders would have little to no reason to redistribute wealth to other shareholders or repay creditors (La Porta et al. 2000). Therefore, when protection for minority shareholders is inadequate, controlling shareholders will extract the private benefits of control (Johnson et al. 2000). This would ultimately discourage minority shareholders from investing in firms and the capital markets would cease to function (Johnson et al. 2000; La Porta et al. 2000). La Porta et al. (2000) argue that the legal protection of the region predetermines the value of private benefits of controls and consequently the optimal ownership structures. Moreover, Shleifer and Vishny

(1997) point out that the power of controlling shareholders depends on the degree of legal protection of their control ownership.

Empirical evidence almost ubiquitously points to a significant negative relationship between the private benefit of control and investor protection. La Porta et al. (1999) analyze the ownership structure of the 20 largest publicly traded firms in 27 countries and observe incentives to expropriate minority shareholders are most pronounced when investor protection is weak. Pinkowits et al. (2006) find that the value of cash holdings decreases in countries with poor investor protection, and they argue the inclination of controlling shareholders to consume private benefits as an explanation. Furthermore, Dittmar and Mahrt-Smith (2007) show that \$1.00 cash is worth \$0.88 and \$0.42 in well-governed and poorly-governed publicly traded American firms, respectively. In a similar American study, Harald et al. (2008) find supporting evidence that firms with weak corporate governance structures hold less cash and are less committed to dividend payouts.

Despite the evident connection between the private benefits of control and investor protection, the evidence of the private benefits of control in Sweden is underwhelming. In recent times, primary research conducted extensively in Sweden concluded that investor protection in Sweden is weak in terms of the protection of minority shareholders (see Agnblad et al., 2002; Institutional Shareholder Services, 2007). However, cross-sectional research, including in Sweden, reveals that the private benefits of control are low compared to regions with similar investor protection. Dyck and Zingales (2004) discover that in their sample of 39 developed countries, the average premium for controlling shareholders is 14 percent of the firm's equity value, and 7.4 percent in Sweden, which they suggest is associated with the value of private benefits of control. Consistent with these results, Nenova (2003) finds that the value of private benefits of control is about one percent in Sweden of the market value of the firm. Adams and Ferreira (2008) discuss the findings of Dyck and Zingales (2004) and Nenova (2003) that the low estimated value of private benefits of control in Sweden is due to shareholder-specific private benefits, which are not adequately reflected by the capital markets.

2.3.2.2. Excess control

Excess control refers to the divergence of control ownership and capital ownership for a single actor. Not to be confused with the separation of control and capital ownership, where the divergence of control and capital is allocated to different actors – managers and shareholders. Excess controls allow specific shareholders to gain control disproportionate to the capital invested. In the context of controlling shareholders, this mechanism enables these shareholders to have high control ownership with a low capital investment.

Excess control can be accomplished through various mechanisms, typically called control devices. The primary control devices are shares with differential voting rights, pyramidal structures, cross-holdings, and holdings through multiple control chains (see Agnblad et al. 2002; Faccio & Lang, 2002; Institutional Shareholder Services, 2007). Prior investigations in Sweden found that shares with differential voting rights is the primary control device and is used in around 60 to 80 percent of all Swedish firms (Agnblad et al. 2002; Institutional Shareholder Services, 2007). Shares with differential voting rights entail the firm having multiple types of shares, each with a unique number of votes. However, under Swedish law, no share class can have more than ten times the number of votes of any other share class (The Swedish Companies Act, 2005).

Since excess control allows controlling shareholders to gain control over a firm with less capital commitment, the agency problems of controlling shareholders are heightened. Panda and Leepsa (2017) describe that excess control allows controlling shareholders to increase the risk appetite in corporate decisions and let debtors and minority shareholders bear the consequences of their risk-seeking behavior. The lower capital ownership also increases the

value of the private benefit of control, thereby escalating opportunistic behavior (Shleifer and Vishny, 1997). Claessens et al. (2002) and La Porta et al. (1999) observe a negative relationship between excess control and firm valuation and interpret excess control as a mechanism for entrenchment effects. In countervailing these findings, Bergström and Rydqvist (1990a) provide evidence that rejects the fact that excess control accessed by shares with differential voting rights has a positive association with the private benefits of control.

Hypothesis 4b: Firms with controlling shareholders with excess control will hold less cash.

2.3.2.3. *Types of ownership*

Typically, but not exhaustively, types of ownership are separated into the following categories: family, widely held, institutional, and state (see Attig et al. 2013; Claessens et al. 2002; Cronqvist & Nilsson, 2003; Faccio & Lang, 2002; La Porta et al. 1999). Despite mixed conclusions, families typically have the most pronounced effects. Claessens et al. (2002) observe that capital ownership is positively associated with firm valuation, independent of identity. They also find that family-controlled firms have greater excess control, leading to discounted firm valuation. Similarly, La Porta et al. (1999) note that average family-controlled firms have significantly more excess control compared to other types of ownership and that family owners are more prone to extract the private benefit of control. Lins et al. (2013) show that family-controlled firms perform significantly worse during financial crises. Cronqvist and Nilsson (2003) find that Swedish family owners have substantial private benefits of control and uncontested discretion over corporate decisions while maintaining a low equity stake in the firm. Finally, Adams and Ferreira (2008) perceive the value of private benefits of control extracted by family owners as substantially understated by the Swedish capital markets and point to the ubiquitous nature of family owners in the business sector as a possible explanation.

Countervailing these findings, Attig et al. (2013) observe that excess cash is more valuable in family-controlled firms and find no relationship between excess control in family-controlled firms and discounted firm valuations.

Hypothesis 4c: Family-controlled firms will hold less cash.

2.4. Limitations

Compared to the previous studies that examine the impact of ownership structures, my study is limited to a direct measure of control ownership, while researchers use the ultimate ownership (e.g., Claessens et al. 2002; La Porta et al. 1999). Ultimate ownership refers to the total control a shareholder has in a given firm through the utilization of control devices and control chains, thus accounting for indirect ownership. For example, a family owns 40 and 10 percent of the control in Firm A and Firm B, respectively. Firm A also controls 20 percent of Firm B. Thus, the family's ability to control Firm B is greater than expected. Using the ultimate ownership to calculate the control of the family on Firm B, one might argue that the family actually controls 30 percent of Firm B – 10 percent via direct control and 20 percent via the chain of control through Firm A. My analysis is limited to only capturing the excess control achieved through shares with differential rights. Using the ultimate ownership would yield a more accurate reflection of certain shareholders' control since it accounts for the usage of multiple chains of control. However, computing the ultimate ownership of all shareholders is beyond the scope of this paper.

Another limitation of this study is the potential impact of survival bias. Survival bias occurs when the analysis is limited to firms that have survived over the study period, thereby excluding firms that have unlisted the SSE due to bankruptcy, mergers, or other reasons. This bias might

lead to over- and underestimated variables due to overestimated performance and governance effectiveness since firms included in the sample are the ones that have remained listed on the SSE. In other words, my sample includes firms with persistently good stock market and financial performance. Thus, firms where one can better capture the negative impact of corporate governance are excluded from the analysis.

3. Data and Method

3.1. Variables

In this section of the paper, I explain the variables used in the analysis.

3.1.1. Corporate cash holdings

Corporate cash holdings are the main variable in my analysis, where corporate cash holdings are cash and cash equivalents. To reduce heteroscedasticity and increase the comparability of cash levels, I use a cash-to-net assets ratio, where net assets are the total book value of assets less cash and cash equivalents. Deflating cash holdings by net assets is preferred in the literature. The deflation by net assets is based on the view that a firm's cash holdings are the results of its ability to generate profits from its assets in place (Opler et al. 1999). As reported later in Table 3, the cash ratio is substantially positively skewed. To increase the interpretability and statistical reliability of the regression models, I use the natural logarithm of the cash ratio in my analysis, CASH.

3.1.2. Excess corporate cash holdings

I use a variation of the reduced-form model developed by Opler et al. (1999) to determine the normal, optimal, levels of corporate cash holdings. In the model, the residual captures deviations from the optimal level of corporate cash holdings, i.e., suboptimal cash holdings. I use the positive residuals as a proxy for the excess corporate cash holdings, XCASH. This is the model:

$$\begin{aligned} \text{CASH}_{it} = & \beta_0 + \beta_1 \text{SIZE}_{it} + \beta_2 \text{CF}_{it} + \beta_3 \text{NWC}_{it} + \beta_4 \text{INDSIG}_{it} + \beta_5 \text{ASR}_{it} + \beta_6 \text{RD}_{it} \\ & + \beta_7 \text{CAPEX}_{it} + \beta_8 \text{LEV}_{it} + \beta_9 \text{DIVDUM}_{it} + \text{Industry and year dummies} \\ & + \varepsilon_{it} \end{aligned} \quad (1)$$

where CASH is the natural logarithm of cash and cash equivalent deflated by net assets, where net assets is the total book value of assets less cash and cash equivalent; SIZE is the natural logarithm of net assets; CF is defined as earnings before interest and taxes plus depreciation deflated by net assets; NWC is defined as current assets minus current liabilities minus cash and cash equivalent deflated by net assets; INDSIG is the idiosyncratic risk and is calculated as the standard deviation of the previous five years' industry-specific cash flows; RD is research and development expenses deflated by net assets, and if RD is missing, I assign it the value zero; ASR is defined as the average cumulative stock return of the previous three years; CAPEX is capital expenditures deflated by net assets; LEV is defined as long-term debt plus current liabilities deflated by net assets; DIVDUM is a dummy variable, set to one if the firm paid dividends during the calendar year, and zero otherwise. The residual, ε , captures the firm-specific natural logarithm of the deviation from the normal, optimal, level of corporate cash holdings.

3.1.3. Firm valuation

Following prior research (see, e.g., Attig et al. 2013), I use the market-to-book value of assets, also referred to as Tobin's Q, as the measurement for firm valuation. The market-to-book value of assets is considered forward-looking because it incorporates the capital market expectations about future profitability and growth prospects (Berk & DeMarzo, 2017). A high market-to-book value of assets indicates that investors perceive the firm's assets are expected to grow significantly in the future. The market value of assets is calculated as the market value of equity plus the book value of assets minus the book value of equity. Though not reported, the market-to-book value of assets is heavily skewed in my sample. Therefore, I use the natural logarithm of the market-to-book value of assets, MTBA, to improve the adequacy and interpretability of the regression models. The model I use to determine the effect of corporate ownership and excess cash on firm valuation is:

$$\text{MTBA}_{it} = \beta_0 + \beta_1 \text{XCASH}_{it} + \beta_2 \text{OWN}_{it} + \beta_3 \text{XCONT}_{it} + \sum_4^8 \beta_k \text{Control}_{itk} + \text{Industry and year dummies} + \varepsilon_{it} \quad (2)$$

where XCASH is the excess level of corporate cash holdings, obtained from model (1); OWN is the capital ownership of the largest shareholder; XCONT is the excess control of the largest shareholder, where excess control is calculated as the control ownership minus the capital ownership; and Control is a vector of five control variables.

To isolate the effect of excess cash and ownership on firm valuation, I control for five firm-specific variables. I use the capital ownership of the largest shareholder, OWN, and the excess control of the largest shareholder, XCONT, to control for entrenchment and incentive effects on the firm valuation. I use CAPEX to control for ownership incentives to increase the firm size and pursue investment opportunities. I use RD to control for investment opportunities. I use LEV to control large shareholders and managerial opportunism. I use SIZE to control for the firm's risk profile and access to capital markets. I use ASR to extrapolate past stock market performance and control for future expected growth opportunities.

Since corporate cash holdings are time- and industry-dependent, I include year and industry indicators in the regressions.

3.1.4. Governance variables

I use several measures to gauge the effect of corporate governance on cash holdings and firm valuation. These include ownership structures, institutional block holdings, types of ownership, and shares with differential voting rights. In the following section, I will describe each one in greater detail.

3.1.4.1. Ownership structure

Regarding ownership structure, I construct five measurements. Firstly, I use the threshold of 20 percent of the total control ownership as a criterion to identify controlling shareholders. I construct the dummy variable, CSD, set to one if at least one shareholder has 20 percent or more of the firm's total control ownership and zero otherwise. Secondly, I use the OWN to present the capital ownership of the largest controlling shareholder. As described in Section 2.3.2., the variable has two contradicting views. It can capture both entrenchment and incentive effects. Thirdly, I measure excess control of the largest shareholder, XCONT, as the control ownership minus capital ownership of the largest shareholder. Contrary to capital ownership, I use excess control as a proxy to capture the entrenchment effect of controlling shareholders. Finally, I employ two measures to capture the impact of contestability of the largest shareholder.

The first one is the proportion of the control ownership of the second largest shareholder to the control ownership of the largest shareholder, CONT21, and the other one is the proportion of the combined control ownership of the second and third largest shareholders to the control ownership of the largest shareholder, CONT231. I measure the effect of ownership structures both as a continuous relationship with the dependent variable and by dividing the sample on the median. Dividing the sample into groups helps to mitigate the effect of measurement errors that governance data might be subject to. The first observation under (over) the median is defined as low (high). Though not tabulated, the results are robust when dividing the data set in terciles.

3.1.4.2. Types of ownership

Consistent with prior research, I investigate the impact of the types of ownership. I classify owners into four categories: family, institutional, widely held, and other. The methodology to classify the owners is described in Section 2.3.2.3.

3.1.4.3. Shares with differential voting rights

I investigate shares with differential voting rights due to the mixed conclusions regarding their impact on firm valuation. However, Agnblad et al. (2002) find shares with differential voting rights are the primary device used by controlling shareholders in Sweden to consume the private benefit of control. Therefore, to isolate the potential indirect effect of private benefits of control, I construct a dummy variable, DVR, which is set to one if the firm has shares with differential voting rights, and zero otherwise.

3.1.4.4. Institutional block holdings

Holderness (2003) argues that institutional block holders have different incentives than other types of ownership. He describes that institutional investors are more inclined to improve management than consume the private benefit of control, though he does not exclude that such behavior exists. I calculate institutional block holdings as the sum of all institutional ownership greater than five percent. Dittmar and Mhart-Smith (2007) find evidence that institutional ownership of above five percent positively impacts the value of cash. These block holdings are expected to mitigate the agency problems and are used as a proxy for the scrutiny managers and firms are subject to experience. Therefore, I expect high institutional block holdings to enhance corporate governance and the value of excess cash.

3.2. Sample selection

I utilize three databases to create a sample of firms listed on the SSE over 2001–2020: LSEG Eikon (formerly Refinitiv Eikon), Holdings by Modular Finance, and Retriever Business.

I collect annual data for 392 publicly traded firms in Sweden from LSEG Eikon starting five years before the sample period to enable the measurement of the idiosyncratic risk for 2001, see Table 1. The variables collected from LSEG Eikon are the following: cash and cash equivalents, book value of equity, market value of equity, book value of total assets, book value of current assets, book value of current liabilities, book value of long-term debt, depreciation, capital expenditures, research and development expenses, net income available to common shareholders, and cash dividends. I exclude 31 financial firms because they are subject to more extensive regulations and may have alternative motives for cash holdings. I further removed observations with insufficient financial information and excluded observations outside the sample period. Finally, I control that observations have at least 100 million SEK in net assets to limit inflated values. The screening process for the sample selection is presented in Table 1.

Table 1 Screening of sample selection

Screening	Number of observations	Loss	Number of firms	Loss
Original sample selection	6500		394	
Sufficient financial data	5933	-567	392	-2
Exclude financial firms	4980	-953	307	-85
Period 2001-2020	1810	-3170	307	0
Sufficient ownership data	2477	-667	220	-87
Net assets >100 million SEK	2477	0	220	0
Sample before model-specific loss	2477		220	

I use Holdings to retrieve annual ownership data for all shareholders with ownership over one percent. The data entails the following information: name of shareholder, percentage of voting rights, percentage of cash flow rights, and types of ownership. However, Holdings uses a different classification system – pension funds, fund company, state, physical, foundation, PE and private equity, and other. Therefore, I manually reclassify these labels to match my research. My methodology for reclassifying the types of ownership is as follows:

1. Firms without a shareholder with at least 20 percent of the control rights are classified as WIDELYHELD. Firms with at least one shareholder with 20 percent of the control rights or more are classified in one of the categories below.
2. **FAMILY:** consists of the family owners in Sweden, such as Wallenberg and Douglas, founders, individuals, and certain foundations.
3. **INSTITUTIONAL:** consists of pension funds and the private equity left over from the classification of family.
4. **OTHER:** consists of shareholders unable to fit in any of the above standing categories.

Unlike previous research (see, Claessens et al. 2002), I include state-control firms in OTHER due to the limited prevalence of this type in my sample.

I use Retriever Business to collect information regarding which firms currently have shares with differential voting rights. This information provides evidence for the firms' share class structure. I assume firms with shares with differential voting rights have had it over the entire sample period. After merging the dataset, I ended up with 2477 observations and 220 firms from 2001 to 2020.

3.3. Descriptive statistics

The variable definitions of all variables are found in Table 2. Applicable variables are accommodated with predicted effect on corporate cash holding and corresponding hypothesis. All variables are winsorized at one percent in each tail to reduce the influence of extreme values on the regression results.

Table 3 depicts the descriptive statistics of the variables used in the study. The cash ratio has a significant variation and has positive skewness. The median firm holds 8.4 percent of cash to net assets, while the average firm holds almost twice as much with 16.2 percent. The average (median) largest shareholder in the sample has 22.6 (19.9) percent in capital ownership and 31.1 (19.9) percent in control ownership. All variables, except CF and LEV, have positive skewness. This implies that the residuals are not normally distributed. Though not reported, I test the normality in each regression and find that the residuals in all regressions are non-normal.

Table 2 Variable definitions

This table represents the variable definitions for all variables used in my analyses. Applicable variables are accommodated with the predicted effect on corporate cash holdings and the corresponding hypothesis.

Variable	Definition	Hypothesis	Predicted sign
MTBA	Natural logarithm of the market-to-book value of assets, where the market value of assets is the market value of equity plus the book value of assets minus the book value of equity.	2	+
Cash	Cash and cash equivalents deflated by net assets		
CASH	Natural logarithm of Cash.		
XCASH	The positive residual from the normal, optimal, level of corporate cash holdings.		
CSD	Controlling shareholder dummy variable, set to one if at least one shareholder has 20 percent or more of the firm's total control ownership, and zero otherwise.	4a	-
OWN	Capital ownership of the largest shareholder.	4a	-
XCONT	Control ownership minus capital ownership of the largest shareholder.	4b	-
CONT21	Ratio of the control ownership of the second largest shareholder to the control ownership of the largest shareholder.		+
CONT231	Ratio of the combined control ownership of the second and third largest shareholder to the control ownership of the largest shareholder.		+
BLOCK	Sum of institutional control ownership greater than five percent of the firm's total control ownership.		+ / -
DVR	Shares with differential voting rights dummy variable, set to one if the firm has shares with differential voting rights, and zero otherwise.		-
SIZE	Natural logarithm of the book value of net assets.	1	-
LEV	Long-term debt plus current liabilities deflated by net assets.		+
ASR	Average cumulative stock return of the previous three years.	2	+
RD	Research and development expenses deflated by net assets, and if research and development expenses are missing.	2	+
INDSIG	Standard deviation of the previous five years industry-specific cash flows.	2	+
CF	Earnings before interest and taxes plus depreciation deflated by net assets.		+
CAPEX	Capital expenditures deflated by net assets.	2	-
DIVDUM	Dividends payout dummy variable, set to one if the firm paid out dividends during the calendar year, zero otherwise.	2	-

Table 2 continued

NWC	Current assets minus current liabilities minus cash and cash equivalent deflated by net assets.		–
FAMILY	Dummy variable, set to one if the shareholder with the largest control ownership in the firm is a family, zero otherwise.	4c	–
INSTITUTIONAL	Dummy variable, set to one if the shareholder with the largest control ownership in the firm is an institutional investor, zero otherwise.		+ / –
WIDELYHELD	Dummy variable, set to one if the control ownership of the largest shareholder does not exceed 20 percent of the firm's total control ownership, zero otherwise.	3a & 3b	+ / –
OTHER	Dummy variable, set to one if none of FAMILY, INSTITUTIONAL, or WIDELYHELD is set to one, zero otherwise.		

As a result, the inference of the regression results is likely incorrect. Therefore, I limit my analysis to focusing on the signs of the coefficients rather than the actual values.

Another potential issue is the limited variation in excess control. A prerequisite in linear regression analysis is to ensure the variable has sufficient variation to capture a relationship between itself and the dependent variable. Thus, estimation problems for the variable, such as inflated coefficients and standard errors, might prevail.

In Table 4, I present the descriptive statistics for key firm characteristics across the types of ownership in my sample. As expected, the sample consists mainly of family-controlled and widely held firms, accounting for 40.3 and 33.1 percent of the observations, respectively. For firms with family, institutional, and widely held ownership, I noticed a drastic decline in the cash ratio from 2001 to 2012, reversing to near prior levels by 2020. A possible explanation is the effect of the 2008–2009 global financial crisis, which resulted in lower cash holdings. Though not tabulated, I compute t-tests to calculate the statistical difference between the variables. I discover that family-controlled firms have significantly, at one percentage level, lower median and average cash ratios compared to firms with other types of ownership over the sample period. As predicted by Hypothesis 4c. As predicted by Hypothesis 3a, firms with dispersed ownership hold significantly more cash than firms with controlling shareholders. Furthermore, the median and average family firms have control over more assets compared to the other types of ownership, which is also significant at one percentage level.

For all types of controlling shareholders, the largest shareholder's capital ownership trend has trended statically over the period 2001–2020. For family and institutional owners, capital ownership fluctuates around 25 to 30 percent in the average firm. Moreover, focusing on the investigation of excess control, I observe that family owners have significantly more excess control than the other types of ownership and that the trajectory of excess control in family-controlled firms is decreasing. In 2001, family owners, on average, controlled 44.5 percent of the firm, while in 2020, 40.1 percent. During this period, excess control decreases from 19.3 to 11.8 percent. This aligns with the research by Bergström and Rydqvist (1999b), who argue that the Swedish controlling shareholders have incentives other than a demand for control.

Table 3 Descriptive statistics

This table represents the descriptive statistics of variables in my sample of firms listed on the Stockholm Stock Exchange over the period 2001–2020. The variable definitions of all variables are found in Table 2.

	Mean	Median	Standard deviation	25th Percentile	75th Percentile	<i>N</i>
Cash	0.162	0.084	0.269	0.036	0.189	2477
OWN	0.226	0.199	0.149	0.109	0.298	2477
XCONT	0.085	0.000	0.118	0.000	0.165	2477
CONT21	0.468	0.416	0.303	0.197	0.738	2456
CONT231	0.750	0.663	0.496	0.323	1.132	2436
BLOCK	0.209	0.169	0.150	0.085	0.282	1648
SIZE	15.228	14.976	1.963	13.638	16.762	2477
MTBA	0.602	0.478	0.624	0.166	0.852	2463
CF	0.071	0.083	0.210	0.042	0.126	2476
NWC	0.045	0.026	0.175	-0.043	0.146	2477
LEV	0.521	0.526	0.200	0.404	0.640	2477
CAPEX	0.043	0.026	0.057	0.011	0.051	2464
RD	0.033	0.000	0.107	0.000	0.021	2477
INDSIG	0.775	0.665	0.488	0.451	1.100	2475
DIV	0.034	0.019	0.060	0.000	0.040	2468
ASR	0.090	0.077	0.269	-0.068	0.223	2139

4. Determinants of Corporate Cash Holdings

In this section, I examine the determinants of corporate cash holdings. Based on the hypotheses, I conduct two types of analysis – univariate and multivariate – to explore the impact of these variables on corporate cash holdings.

4.1. Univariate analysis

To examine the hypotheses in a univariate setting, I divide the firms into four groups based on the quartiles of the cash ratio for each year. I report the mean and median values for each cash quartile for all variables. The results are tabulated in Table 5. I hypothesize that characteristics significantly differ from the first quartile of cash holdings to the fourth quartile, where the first (fourth) quartile represents the firms with the lowest (highest) cash ratio. To test if the first-quartile and fourth-quartile firms are significantly different, I use a t-test. This notion is valid and significant at a one percent level for all variables except CF, BLOCK, and ASR.

I expand the investigation by exploring if the univariate relationships with corporate cash holdings are monotonic. I observe that larger firms hold significantly less cash than smaller firms. The monotonic relationship implies that cash holdings decrease as the firm's size increases, as predicted by Hypothesis 1. Supporting Hypothesis 2, precautionary motive, I find that growth opportunities, proxied as the market-to-book value of assets and research and development expenses, and idiosyncratic volatility increase monotonically with the cash ratio. Further supporting this motive, I observe a decreasing monotonic relationship between cash holdings and capital expenditures. Net working capital has a positive monotonic relation-

Table 4 Ownership of the largest shareholder and key firm characteristics across types of ownership

This table presents the annual ownership of the largest shareholder and key firm characteristics across the types of ownership of the publicly listed firms on the Stockholm Stock Exchange over the period 2001–2020. The firms are divided into four categories of types of ownership. Cash is cash and cash equivalents deflated by net assets; Net Assets is the total book value of assets less cash in a million SEK; OWN is the average capital ownership of the largest shareholder; and XCONT is the average excess control of the largest shareholder, where excess control is calculated as the control ownership minus the capital ownership of the largest shareholder.

Year	FAMILY							INSTITUTIONAL						
	Number of firms	Cash		Net Assets		OWN	XCONT	Number of firms	Cash		Net Assets		OWN	XCONT
		Mean	Median	Mean	Median				Mean	Median	Mean	Median		
2001	36	0.126	0.116	22057	2239	0.252	0.193	10	0.135	0.104	8397	1679	0.282	0.045
2002	34	0.126	0.103	12833	1845	0.269	0.180	9	0.107	0.083	10414	1992	0.272	0.072
2003	35	0.136	0.093	11889	1661	0.268	0.173	8	0.189	0.123	9525	786	0.258	0.095
2004	39	0.126	0.095	11524	1847	0.265	0.164	5	0.113	0.086	13928	1040	0.284	0.100
2005	41	0.101	0.072	13726	2406	0.268	0.163	5	0.192	0.235	5154	801	0.267	0.101
2006	42	0.099	0.059	14112	3054	0.268	0.167	7	0.093	0.055	5497	1600	0.272	0.080
2007	47	0.092	0.070	15009	3039	0.274	0.159	9	0.089	0.064	4873	1410	0.257	0.068
2008	53	0.102	0.081	14449	2815	0.275	0.158	8	0.075	0.048	6413	1238	0.243	0.075
2009	54	0.113	0.094	13316	2534	0.276	0.152	9	0.096	0.049	5188	1075	0.261	0.065
2010	55	0.098	0.074	13599	3138	0.288	0.143	11	0.114	0.071	3592	871	0.278	0.074
2011	62	0.095	0.070	19453	3577	0.281	0.141	13	0.192	0.100	5684	941	0.271	0.079
2012	67	0.089	0.066	23308	5318	0.285	0.131	13	0.120	0.035	5503	480	0.262	0.060
2013	65	0.085	0.055	24414	5142	0.280	0.135	16	0.116	0.074	4585	411	0.254	0.061
2014	65	0.092	0.082	26493	5071	0.296	0.135	18	0.111	0.068	6514	1461	0.265	0.054
2015	75	0.096	0.080	23953	3365	0.308	0.124	21	0.132	0.083	7637	2313	0.288	0.046
2016	79	0.099	0.077	24809	3302	0.300	0.124	19	0.104	0.074	7635	2092	0.266	0.051
2017	94	0.091	0.067	23925	4427	0.287	0.131	18	0.120	0.085	7474	2194	0.260	0.044
2018	98	0.088	0.054	25643	5388	0.278	0.132	24	0.109	0.082	7239	2440	0.286	0.057
2019	102	0.078	0.060	28159	5323	0.277	0.126	26	0.135	0.054	8301	3330	0.290	0.045
2020	102	0.106	0.086	28248	6057	0.283	0.118	30	0.159	0.093	6832	1884	0.301	0.047

Table 4 continued

Year	WIDELYHELD								OTHER							
	Number of firms	Cash		Net Assets		OWN	XCONT	Number of firms	Cash		Net Assets		OWN	XCONT		
		Mean	Median	Mean	Median				Mean	Median						
2001	17	0.158	0.124	36444	4277	0.117	0.001	3	0.053	0.049	50215	32598	0.419	0.136		
2002	21	0.137	0.095	27805	5392	0.114	0.004	4	0.057	0.041	105469	107676	0.258	0.121		
2003	22	0.155	0.095	22035	6287	0.113	0.003	3	0.109	0.071	122083	162753	0.243	0.051		
2004	24	0.156	0.110	19595	4900	0.106	0.015	3	0.096	0.097	115633	163267	0.341	0.089		
2005	27	0.166	0.113	19716	1157	0.100	0.024	5	0.092	0.088	88710	47808	0.292	0.052		
2006	34	0.162	0.127	18714	1260	0.100	0.021	6	0.096	0.089	76556	28363	0.309	0.013		
2007	39	0.159	0.087	20206	1459	0.095	0.023	7	0.111	0.057	77853	20325	0.310	0.012		
2008	37	0.138	0.089	23877	1908	0.092	0.025	7	0.090	0.065	91270	19947	0.314	0.011		
2009	37	0.140	0.109	29911	2036	0.090	0.026	7	0.080	0.094	82643	19600	0.303	0.012		
2010	39	0.128	0.083	34908	1751	0.099	0.023	6	0.088	0.065	44311	1953	0.304	0.042		
2011	38	0.107	0.074	27715	1499	0.107	0.013	6	0.051	0.053	46173	3720	0.324	0.041		
2012	33	0.097	0.063	24285	1756	0.102	0.014	6	0.072	0.066	43521	3799	0.319	0.040		
2013	34	0.103	0.056	24341	2450	0.105	0.010	5	0.111	0.130	50785	5874	0.328	0.048		
2014	46	0.107	0.062	26125	2010	0.108	0.016	6	0.108	0.097	44363	4239	0.399	0.060		
2015	48	0.118	0.077	25680	2016	0.115	0.011	9	0.114	0.081	33372	4974	0.309	0.048		
2016	52	0.130	0.093	27304	3037	0.106	0.014	8	0.095	0.071	35731	3800	0.302	0.056		
2017	67	0.149	0.085	21769	2557	0.112	0.012	10	0.086	0.091	28990	3586	0.348	0.046		
2018	65	0.136	0.082	24279	2363	0.116	0.009	9	0.076	0.058	33702	1701	0.367	0.033		
2019	70	0.153	0.096	25804	2524	0.113	0.008	10	0.069	0.058	75537	7806	0.414	0.030		
2020	69	0.192	0.129	23985	2699	0.118	0.008	13	0.177	0.109	56134	1180	0.365	0.036		

Table 5 Ownership and firm characteristics relative to corporate cash holdings

This table presents a univariate comparison of the means and medians of key variables for publicly listed firms on the Stockholm Stock Exchange over the period 2001–2020. Firms are divided into quartiles based on the cash-to-net-assets ratio. The quartiles are calculated for each year. Median values are in square brackets. The variable definition is the variables presented in Table 2. The t-statistic is for the difference of means of the first and fourth quartile. The p-values are reported in parentheses.

	First Quartile	Second Quartile	Third Quartile	Fourth Quartile	<i>t</i> -statistic (p-value)
Cash	0.018 [0.018]	0.059 [0.057]	0.128 [0.122]	0.443 [0.321]	-25.284 (0.000)
OWN	0.237 [0.213]	0.230 [0.202]	0.242 [0.215]	0.193 [0.156]	5.339 (0.000)
XCONT	0.098 [0.025]	0.074 [0.000]	0.086 [0.000]	0.080 [0.000]	2.653 (0.008)
CONT21	0.467 [0.391]	0.469 [0.413]	0.421 [0.370]	0.513 [0.508]	-2.592 (0.010)
CONT231	0.741 [0.633]	0.752 [0.645]	0.691 [0.567]	0.816 [0.783]	-2.639 (0.008)
BLOCK	0.189 [0.149]	0.231 [0.202]	0.202 [0.156]	0.210 [0.172]	-2.175 (0.030)
SIZE	15.724 [15.856]	15.259 [15.153]	15.137 [14.709]	14.247 [13.593]	13.156 (0.000)
MTBA	0.856 [0.783]	0.957 [0.923]	1.035 [0.970]	1.448 [1.293]	-23.470 (0.000)
CF	0.058 [0.062]	0.076 [0.081]	0.086 [0.092]	0.078 [0.114]	-1.847 (0.065)
NWC	0.015 [-0.006]	0.056 [0.048]	0.057 [0.050]	0.059 [0.071]	-4.750 (0.000)
LEV	0.480 [0.489]	0.527 [0.540]	0.545 [0.560]	0.526 [0.518]	-3.809 (0.000)
CAPEX	0.055 [0.037]	0.037 [0.026]	0.037 [0.026]	0.038 [0.020]	5.223 (0.000)
RD	0.006 [0.000]	0.015 [0.000]	0.016 [0.000]	0.082 [0.017]	-14.068 (0.000)
INDSIG	0.679 [0.620]	0.733 [0.661]	0.816 [0.688]	0.872 [0.727]	-6.862 (0.000)
DIV	0.023 [0.017]	0.025 [0.020]	0.035 [0.024]	0.053 [0.020]	-7.559 (0.000)
ASR	0.085 [0.090]	0.059 [0.048]	0.094 [0.069]	0.115 [0.099]	-1.831 (0.067)

ship with cash holdings. Leverage only increases monotonically with cash holdings across the first three quartiles. The same relationship exists with corporate cash holdings for cash flows. The total dividend payout to shareholders is statistically different in the first and fourth quartile, at a ten percent level, and the average payout is monotonically increasing with corporate cash holdings. The relationship is not monotonic for past stock market returns.

Regarding the governance variables, I note that the average capital ownership of the largest shareholder is significantly larger in the first quartile of cash holdings than in the fourth quartile. However, the relationship is not monotonic. The capital ownership of the largest shareholders is, on average, 23.0 to 24.2 percent of the first three quartiles and 19.3 percent for the fourth quartile. The difference is more pronounced when examining the median firm. The results weakly support Hypothesis 4a because controlling shareholders have lower cash holdings. If capital ownership is related to firm size, controlling shareholders prefer large- to

medium-sized firms over small firms. One interpretation is that controlling shareholders are risk-averse and more inclined to invest in larger, more stable firms. Though the excess control of the largest shareholder is significantly larger in firms with less cash, the relationship is not monotonic for the average firm. In the median firm, the excess control is zero for all quartiles except the first. The contestability in the average and median firm in the first quartile is significantly lower than in the fourth quartile. This might result from the higher excess control in the first quartile firms. Like excess control, the relationship is not monotonic.

4.2. Multivariate analysis

In this section, I investigate the relationship between corporate cash holdings and governance and various firm-specific variables in a multivariate setting using cross-sectional and time-series regressions. The results are reported in Table 6. Regressions (1-5) are estimated using the methodology proposed by Petersen (2009). He observes that in the presence of firm and time effects in financial panel data sets, standard errors estimated by OLS, White, and Fama-MacBeth are biased due to dependencies in the residual caused by serial correlation. He further elaborates that specifying the regression with firm-fixed effects will only generate unbiased standard errors when the firm effect is permanent over time. Due to fluctuating economic conditions during my sample period, e.g., the global financial crisis, COVID-19, environmental sustainability policies, and technology advancements, I perceive the firm effects in my sample are not permanent in the manner required for fixed effects to yield unbiased results. To mitigate these concerns and estimate unbiased standard errors, Petersen proposes to address one dimension parametrically and then correct the standard errors by clustering at the other dimension. Therefore, to produce unbiased standard errors, I use GLS regressions with year and industry indicators, and standard errors are estimated with clustering at the firm level. The dependent variable in all regressions is CASH, represented as the natural logarithm of the cash-to-net assets ratio. I further compute two additional types of regressions with different econometric applications. Regression (6) uses the Fama and MacBeth (1973; henceforth, Fama-MacBeth) methodology to create cross-sectional regressions for each year. The Fama-MacBeth regression corrects the serial correlation in the residual cross-sectional regression by treating each year as an independent cross-section. However, Fama-MacBeth regression still yields biased standard errors if time effects exist in the panel data (Petersen, 2009). Therefore, the results of this regression are only unbiased under the assumption of time independence in the residual. Regression (7) is a cross-sectional regression using only firms with a full panel of data. Like regressions (1-5), the cross-sectional regression has year and industry indicators clustered at the firm level. This regression treats the data set as independent observations for each firm at a specific time, allowing for analyzing the relationships between corporate cash holdings and governance variables while controlling for potential biases due to missing data and ensuring consistent results.

Regression (1) presents the model (1) described in Section 3.1.2. and is used to estimate normal levels of corporate cash holdings. Though I hypothesize that the market-to-book value of assets, which measures growth opportunities, has a positive impact on cash holdings, I exclude it from the regression used to estimate normal levels of corporate cash holdings. The reason is endogeneity concerns. Including the market-to-book value of assets to predict the normal and excess levels of cash holdings, and subsequently applying it as the dependent variable while using excess cash holdings as an independent variable creates reverse causality problems. Therefore, I construct ASR as an instrumental variable to proxy for growth

opportunities in the regression. ASR is the average cumulative stock return of the previous three years. ASR is a measure of past growth to extrapolate future growth opportunities.

Table 6 Multivariate analysis of corporate cash holdings

This table presents the determinants of corporate cash holdings for publicly listed firms on the Stockholm Stock Exchange over the period 2001–2020. The dependent variable is CASH. The variable definitions for all variables are presented in Table 2. Regressions (1-5) use firm-fixed effects and exclude firms with only one observation. Regression (6) is a Fama and MacBeth (1973) regression that gives the average of the time series of coefficients from annual cross-sectional regressions. Regression (7) is a cross-sectional regression that only uses firms with observations for the full sample period. Standard errors in regressions (1-5) and (7) are corrected by clustering at the firm level. All standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively. Though not reported, all regressions are statistically significant and include industry and year indicators and an intercept term.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MTBA		0.186*** (0.021)	0.184*** (0.021)	0.186*** (0.021)	0.192*** (0.024)	0.180*** (0.014)	0.177*** (0.016)
CSD			-0.035*** (0.010)		-0.032** (0.013)		
OWN				-0.020 (0.039)	0.083 (0.058)		
XCONT				-0.083 (0.074)	-0.050 (0.065)		
CONT231					0.004 (0.015)		
BLOCK					-0.076** (0.037)		
SIZE	-0.055*** (0.008)	-0.040*** (0.006)	-0.041*** (0.006)	-0.040*** (0.006)	-0.034*** (0.005)	-0.006*** (0.001)	-0.007*** (0.003)
CF	0.230*** (0.055)	0.056 (0.049)	0.058 (0.049)	0.056 (0.049)	-0.028 (0.055)	0.127* (0.067)	0.221*** (0.072)
NWC	-0.070* (0.040)	-0.086* (0.048)	-0.084* (0.047)	-0.085* (0.047)	-0.070 (0.055)	-0.008 (0.019)	-0.019 (0.032)
INDSIG	0.027** (0.012)	0.006 (0.010)	0.005 (0.010)	0.005 (0.010)	0.000 (0.013)	-0.004 (0.007)	0.032** (0.013)
ASR	0.039** (0.015)						
RD	0.496*** (0.138)	0.407*** (0.113)	0.399*** (0.109)	0.405*** (0.112)	0.393*** (0.125)	0.604*** (0.082)	0.722*** (0.119)
CAPEX	0.073 (0.060)	0.028 (0.065)	0.021 (0.062)	0.029 (0.065)	-0.036 (0.084)	-0.099 (0.069)	-0.004 (0.105)
LEV	0.092** (0.040)	0.035 (0.036)	0.034 (0.035)	0.035 (0.036)	0.041 (0.044)	0.037* (0.020)	0.144*** (0.024)
DIVDUM	0.014 (0.010)	-0.005 (0.009)	-0.00 (0.009)	-0.005 (0.009)	-0.01 (0.010)	-0.035*** (0.007)	-0.031*** (0.010)
<i>N</i> observations	2,129	2,449	2,449	2,449	1,631	2,449	980
Adj. R-squared	0.265	0.348	0.357	0.349	0.335	0.596	0.567
<i>N</i> firms	199	220	220	220	203	230	49

In regression (1), I find a significant relationship between firm size, cash flows, net working capital, idiosyncratic risk, investment opportunities, research and development expenses, and leverage with corporate cash holdings. As predicted by Hypothesis 1, I observe a negative association between firm size and corporate cash holdings. This result is also indirectly supported by Hypothesis 2, as larger firms have greater access to external capital markets and lower risk profiles. Thus, I interpret these results, similar to Opler et al. (1999), that large firms, whether due to greater access to external capital markets, lower risk profile, or lower transaction costs, hold less cash than smaller firms. I discover further support for Hypothesis 2 with the significant positive impact of idiosyncratic risk on cash holdings, implying that firms in industries with higher deviation in cash flow stockpile cash to mitigate future underinvestments.

In regression (2), I replace ASR with MTBA to better reflect investment opportunities. The regression is a slight variation of Opler et al. (1999) reduced-form regression; only acquisition expenditures are excluded. Consistent with their findings, I identify a positive significant relationship between investment opportunities and corporate cash holdings, as predicted by Hypothesis 2. The substitution of MTBA for ASR is theoretically justified as MTBA captures the market's perception of a firm's growth potential and future profitability rather than extrapolating historical growth for future growth opportunities. This improvement aligns with the findings of Opler et al. (1999), who also emphasized the importance of investment opportunities in determining cash holdings. The substantial increase in the adjusted R-squared, from 26.5 to 34.8 percent, indicates that MTBA significantly enhances the model's explanatory power, highlighting its relevance as a determinant. Implementing MTBA results in insignificant coefficients for cash flows, idiosyncratic risk, and leverage, indicating that investment opportunities are the driving factor of the precautionary motive, while the other variables are less meaningful in explaining corporate cash holdings.

Regression (3) explores the effect of controlling shareholders on corporate cash holdings. As predicted by Hypothesis 4a, controlling shareholders have a negative association with corporate cash holdings, significant at a one percent level. The association also supports Hypothesis 3a, implying that widely held firms hold significantly more cash. This result robust the evidence in Section 3.3. and provides support to Cronqvist and Nilsson (2003) for the consumption of private benefits of control by Swedish controlling shareholders. The regression results are consistent with the signs and significance of the coefficients of regression (2).

In regression (4), I replace CSD with OWN and XCONT. I remove CSD from the regression to focus the analysis on the linear relationship between control and capital ownership. The results for both OWN and XCONT are insignificant. This lack of significance suggests that neither capital ownership nor excess control of the largest shareholder significantly impacts corporate cash holdings. Comparing CSD, OWN, and XCONT results indicates that the relationship between capital and control ownership might be non-linear. CSD examines the impact of control ownership on cash holdings by comparing the average level of cash holdings when the firms have a controlling shareholder and not. Thus, this method elevates the impact of non-linearity in the variables by solely focusing on the binary change in levels. Furthermore, as expressed in Section 3.3., the insignificance of excess control might be explained by the insufficient variation in the variable, implying an inability to effectively capture a relationship between excess control and corporate cash holdings.

I expand the analysis of regressions (3-4) by adding CONT231 and BLOCK in regression (5). These variables are expected to limit the potential value of private benefits of control and, therefore, induce higher corporate cash holdings. The regression results indicate the impact of controlling shareholders is unaffected by the governance measures and, unexpectedly, BLOCK is negatively associated with corporate cash holdings. One interpretation, in line with

Holderness (2003), is that institutional investors keep lower cash holdings in the firm because of the private benefits of control, both efficient and inefficient.

Regression (6) displays the Fama-MacBeth model, and the results are consistent with regression (2). This implies that time dependencies in the sample are not driving the observed relationships, reinforcing the robustness of the results. The consistency between regression (2) and the Fama-MacBeth model indicates that the determinants of corporate cash holdings in Sweden are stable over time and not influenced by temporal autocorrelations, even during economic recessions. The robustness of the results is crucial as it suggests that the identified relationships are likely to persist in the future, independent of the economic conditions, providing solid support for hypotheses 1 and 2. The most noticeable deviation of the models is the negative association between corporate cash holdings and dividends. The sign and significance of the coefficient corroborates Hypothesis 2. This discrepancy suggests that dividend payouts are a time-dependent determinant of corporate cash holdings, implying the impact of dividends on corporate cash holdings is most noticeable under certain conditions.

A cross-sectional regression with industry and year indicators is reported in regression (7). The cross-sectional regression only includes firms with a full panel of data, leaving 49 firms remaining. This regression provides results similar to those of the Fama-MacBeth regression. The exception is a positive relationship between cash holdings and idiosyncratic risk and supports Hypothesis 2. The relationship has a clear economic intuition, firms that generate more cash flow have larger cash holdings, *ceteris paribus*.

5. The Impact of Corporate Ownership and Excess Cash on Firm Valuation

In the previous section, I examined how corporate cash holdings are affected by firm characteristics and ownership. In this section, I examine how cash holdings deviate from the optimal level across the types of ownership and the impact of excess cash and corporate ownership on firm valuation. As Jensen (1986) hypothesized, excess cash in poorly governed firms is more likely to be spent inefficiently. Therefore, this investigation aims to determine what governance structures are considered beneficial for the firm and how the excess cash holdings are valued in these firms.

As in previous literature, I define excess cash as the cash held by the firm above the predicted, optimal, level of cash. I retrieve the residual from the regression (1) in Table 6, which captures the deviation from the optimal level. As the investigation aims to examine *excess* cash, I only use the residuals larger than zero as excess corporate cash holdings. Like regressions (1-4) in Table 6, I again use the methodology proposed by Petersen (2009) to obtain unbiased results when examining the impact of corporate ownership and excess cash on firm valuation. The dependent variable in the regressions is the natural logarithm of the market-to-book value of assets, MTBA.

5.1. Ownership structures, firm valuation, and excess cash

The impact of ownership structures on the relationship between excess cash holdings and the firm valuation is presented in Table 7. Regression (1) displays the firm-specific regression results on the sample, consisting of 1,017 firm-years. I observe that all variables except excess control and leverage have a statistically significant impact on firm valuation, at a one percent level. Leverage is statistically significant at a five percent level. Consistent with previous research, the results indicate that excess cash positively impacts firm valuation (see, e.g., Attig et al. 2013). This shows the capital markets value excess cash in my sample. In line with Cronqvist and Nilsson (2003), capital ownership of the largest shareholder is negatively

associated with firm valuation, which might suggest ownership entrenchment. However, contrary to Claessens et al. (2003) and La Porta et al. (1999), I do not observe a relationship between excess control and firm valuation.

The significant relationships with firm valuation are research and development expenses and capital expenditures. Research and development expenses and capital expenditures are part of the firm's investment decisions. The positive sign of the coefficients suggests that, on average, the funds allocated towards investment decisions to grow and improve the firm's operations are viewed as value-increasing by the capital markets while controlling for other factors.

In regressions (2-3), I report the impact of controlling shareholders on excess cash and firm valuation. The regression specification of regression (2) uses the subsample of the firms without a controlling shareholder, while regression (3) uses the subsample of firms with at least one controlling shareholder. The regression results reveal that excess is statistically significant only in the subsample of firms with at least one controlling shareholder. In line with Hypothesis 3b, I interpret the relationship as investors do not value excess cash in firms with dispersed ownership due to the high likelihood of the excess being inefficiently allocated. Contradictory to the argument, I observe a positive association with firm valuation for both research and development expenses and capital expenditures, implying that investments performed in widely held firms are value-increasing. However, this is only partially the case for controlling shareholders. Only research and development expenses are significantly associated with firm valuation, while capital expenditures are not. The results imply that capital expenditure does not create value in firms with controlling shareholders from the perspective of investors. In line with Cronqvist and Nilsson (2003), I conjecture that the results indicate the consumption of the private benefit of control through performing suboptimal capital expenditures by controlling shareholders.

Moreover, the capital ownership of the largest shareholder's effect on firm valuation reveals an exciting relationship. The impact of capital ownership is most pronounced in the absence of controlling shareholders. This implies that capital ownership is most severe when control ownership of the largest shareholder is in the range of zero to twenty percent. Beyond this point of control ownership, the effect of capital ownership is less severe. The results suggest that investors in the Swedish capital markets value firms with controlling shareholders *marginally* less negatively than firms with dispersed ownership. The absolute impact of capital ownership on firm valuation is larger for controlling shareholders since they hold larger capital ownership than the largest shareholder in widely held firms. This supports the notation expressed by the CSE and Investor et al. (2020) that the Swedish governance model is beneficial to minority shareholders in order to generate effectively and shareholders support long-term growth.

Regressions (4-11) use the subsample of firms with controlling shareholders. This examines the effects of contestability, shares with differential voting rights, and institutional block holdings on controlling shareholders. A significant drawback with this approach is that some regressions are restricted to small subsamples, approximately 200 firm years. This might create inflated standard errors and potentially unreliable estimates. Despite the high explanatory power of the regressions, the limited sample size makes it more challenging to detect valid relationships and increases the likelihood of type I and type II errors.

In regressions (4-7), I extend my analysis to investigate the impact of contestability on the largest shareholder. Low (high) implies low (high) contestability of the largest shareholder by the second largest shareholder, in regressions (4-5), and by the second and third largest shareholders, in regressions (6-7). Although the results suggest that excess cash is valuable in both low and high contestability, the size of the coefficients deviates, both significant at a one percent level. Despite excess cash being more valuable in the subsample with firms with high contestability, the difference of the coefficients is not statistically significant. Regarding how -

Table 7 The effect of ownership structures on the impact of excess cash and corporate ownership on firm valuation

This table presents firm-specific regression results on the effect of ownership structures on the impact of excess cash and corporate ownership valuation for publicly listed firms on the Stockholm Stock Exchange over the period 2001–2020. The dependent variable is MTBA. The variable definitions for all variables are presented in Table 2. In regressions (4–11), only firms with controlling shareholders are used. The *t*-statistics are calculated as the statistical difference between the coefficients of high minus low or one minus zero, and the significance is determined by a two-tailed Student's *t*-test. Standard errors are corrected by clustering at the firm level and reported in parentheses. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively. Though not reported, all regressions are statistically significant and include industry and year indicators and an intercept term.

	CSD			<i>t</i> -statistic	CONT21		<i>t</i> -statistic	CONT231		<i>t</i> -statistic
	(1)	0 (2)	1 (3)		Low (4)	High (5)		Low (6)	High (7)	
XCASH	0.888*** (0.272)	0.752 (0.567)	0.961*** (0.292)	0.328	0.643*** (0.095)	1.111*** (0.323)	1.390	0.668*** (0.126)	1.300*** (0.428)	1.417
OWN	-0.510*** (0.133)	-1.042** (0.433)	-0.358** (0.179)	1.460	-0.227 (0.168)	-1.121** (0.469)	-1.795*	-0.241 (0.156)	-1.043* (0.424)	-1.775*
XCONT	0.154 (0.169)	0.568 (0.714)	0.261 (0.190)	-0.416	0.190 (0.234)	0.295 (0.358)	0.246	0.098 (0.216)	0.328 (0.359)	0.548
SIZE	-0.056*** (0.017)	-0.098*** (0.024)	-0.031 (0.021)	2.132**	-0.044** (0.021)	-0.047* (0.024)	-0.112	-0.040** (0.020)	-0.031 (0.022)	0.317
ASR	0.593*** (0.046)	0.751*** (0.073)	0.511*** (0.060)	-2.543**	0.478*** (0.073)	0.544*** (0.074)	0.634	0.495*** (0.074)	0.559*** (0.087)	0.561
RD	1.063*** (0.306)	1.079*** (0.365)	1.345*** (0.295)	0.567	1.499*** (0.484)	1.333* (0.759)	-0.184	1.311*** (0.463)	1.764** (0.769)	0.505
CAPEX	0.710*** (0.272)	1.208*** (0.396)	0.389 (0.332)	-1.585	0.469* (0.241)	0.941*** (0.294)	1.242	0.340 (0.222)	0.242 (0.562)	-0.162
LEV	0.212** (0.091)	0.297 (0.192)	0.028 (0.096)	-1.256	0.087 (0.115)	-0.032 (0.141)	-0.656	0.029 (0.117)	-0.105 (0.160)	-0.675
<i>N</i> observations	1017	340	677		470	207		481	193	
Adj. R-squared	0.497	0.628	0.482		0.535	0.640		0.559	0.624	
<i>N</i> firms	186	91	129		98	64		96	67	

Table 7 continued

	DVR		<i>t</i> -statistic	BLOCK		<i>t</i> -statistic
	0 (8)	1 (9)		Low (10)	High (11)	
XCASH	1.466** (0.341)	0.698*** (0.139)	-2.086**	0.622* (0.321)	1.938*** (0.642)	1.833*
OWN	0.016 (0.215)	-0.434** (0.147)	-1.728*	-0.287 (0.236)	-0.271 (0.396)	0.035
XCONT	-61.950 (121.900)	0.152 (0.179)	0.509	-0.052 (0.213)	0.078 (0.254)	0.393
SIZE	0.000 (0.045)	-0.041* (0.021)	-0.819	-0.060*** (0.019)	-0.029 (0.030)	0.859
ASR	0.680*** (0.120)	0.439*** (0.054)	-1.830*	0.354*** (0.070)	0.680*** (0.117)	2.395**
RD	1.883** (0.743)	0.873*** (0.270)	-1.278	1.277* (0.746)	1.481*** (0.529)	0.223
CAPEX	-0.832 (0.728)	0.675** (0.335)	1.881*	0.573 (0.359)	0.461 (0.359)	-0.221
LEV	0.073 (0.250)	0.021 (0.099)	-0.195	-0.088 (0.137)	0.092 (0.177)	0.802
<i>N</i> observations	188	489		226	171	
Adj. R-squared	0.569	0.531		0.545	0.663	
<i>N</i> firms	47	82		74	60	

the difference is calculated, the insignificant result is likely due to insufficient sample size in the group with high contestability due to inflated standard errors.

Moreover, the coefficient for OWN reveals that the negative impact of capital ownership is significantly more pronounced in firms with high contestability than in firms with low, and the difference is statistically significant at a ten percent level. I observe the opposite of the expected positive or neutral effect of contestability on capital ownership entrenchment. I conjecture that these results are from coalitions formed by controlling shareholders or frictions among large shareholders. In the former, instead of contesting the largest shareholder, they cooperate and collectively use the firm to consume the private benefit of control. Therefore, they are valued negatively by the capital markets. The latter entails that capital markets perceive the relatively equal distribution of power among the large shareholders in the firm to lead to less efficient governance.

I examine the inconclusive previous research on the impact of shares with differential voting rights, DVR, in regressions (8-9). I use DVR as a proxy for the private benefits of control. As shown by Agnblad et al. (2002), DVR is the primary control device used by controlling shareholders in Sweden to achieve excess control. Therefore, I argue that this divides the sample of controlling shareholders into two groups, where the group of DVR has an increased incentive to consume the private benefits of control. Regression (8) is applied on the subsample with firms without DVR and regression (9) with firms with DVR. I find that excess cash is less valuable in firms with differential voting rights than the opposite. The difference is statistically significant at a five percent level. The result is countervailing to Bergström and Rydqvist (1990a, 1990b) and the CSE. Although Bergström and Rydqvist argue that DVR does not support the private benefit of control, they do not exclude such behavior. My results suggest the opposite. One explanation for the lesser valued excess cash in firms with DVR is the possibility of wealth extraction by controlling shareholders perceived by capital markets, supporting the findings of Cronqvist and Nilsson (2003). This notion is further supported by the negative relationship between capital ownership and firm valuation in firms with DVR, with no significant association in firms without DVR. The difference is statistically significant at a ten percent level. This further confirms the negative entrenchment effect of capital ownership and private benefits of control in firms with DVR.

Interestingly, both research and development expenses and capital expenditures have a positive association with firm valuation in firms with DVR. In contrast, only research and development expenses significantly impact the valuation of firms without DVR. This implies that although the controlling shareholders in firms DVR enjoy the private benefits of control, on average, the investment decisions performed in these firms benefit shareholders.

Regressions (10-11) evaluates the impact of institutional block holdings on the relationship between excess cash and firm valuation. Regression (10) uses the subsample with low institutional block holdings and regression (11) with high. The results are consistent with Dittmar and Mahrt-Smith (2007) and Holderness (2003), implying that institutional block holdings significantly improve the value of excess cash. However, the regressions are computed on small subsamples and both regressions seem to suffer from inflated standard errors compared to the regressions with large samples. Therefore, there is a high possibility that these results, when comparing the two models, will not bring robust results.

5.2. Types of ownership, firm valuation, and excess cash

In Section 3.3., I examined how the level of corporate cash differs across types of ownership. The results revealed that the average and median family-controlled firm holds significantly less cash compared to non-family-controlled firms. However, the analysis does not account for the normal levels of corporate cash holdings and if the firms hold more or less than optimal. Figure 1 displays how the average firm's cash holdings deviate from the optimal

level across types of ownership. The figure reveals that widely held firms hold more cash than expected, and firms with controlling shareholders and family-controlled firms hold less cash than expected. These results support Hypothesis 3a and 4c.

Nevertheless, in this section, I expand the analysis by dividing the sample into subsamples depending on the type of ownership. The results are found in Table 8.

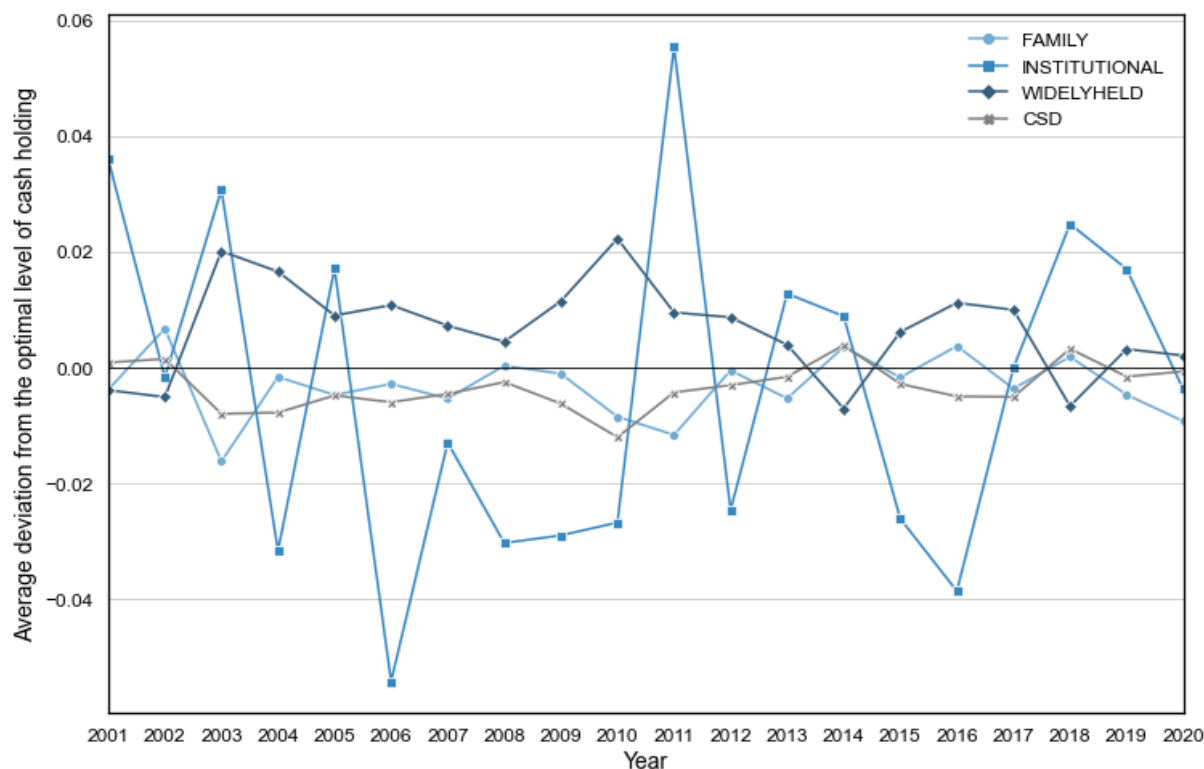


Figure 1 Deviation from optimal levels of cash holdings

This figure depicts the average deviation from the optimal, or normal, level of cash holding predicted by regression (1) in Table 6 for family-controlled firms (dark blue), institutional-controlled firms (blue), widely held firms (light blue), and firms with controlling shareholders (grey). The samples consist of publicly listed firms on the Stockholm Stock Exchange over the period 2001–2020.

Regressions (1-3) reveal the effects of family-, institutional- and widely held firms on the relationship between excess cash holdings and firm valuation, respectively. Regressions (4-6) present the *t*-statistic of the statistical difference between the coefficients of the regressions (1-3).

I observe that family and institutional controlling shareholders have a significant positive effect on the value of the excess, while widely held firms do not. Excess cash is more than twice as valuable in institutional-controlled firms compared to family-controlled firms, and the difference is significant at a ten percent level. Similar to the findings for CSD in Table 6, the capital ownership of the largest shareholder in family firms negatively impacts firm valuations, and the impact is more pronounced in widely held firms.

Remarkably, there is no significant impact when the controlling shareholder is an institutional investor. One interpretation of these results is that institutional controlling shareholders mitigate the more severe agency problems that arise from dispersed ownership but shift into new agency problems. In line with Holderness (2003), this implies the private benefits of control are less enjoyed by institutional investors. Consistent with his proposal, institutional investors seem to have other incentives for investing than wealth extraction. The results from family firms suggest that agency problems still exist but likely have shifted from opportunistic behavior in managers to controlling shareholders. Like the results from regressions (2-3) in

Table 6, this also points to the fact that capital markets view the capital ownership of controlling shareholders as marginally less unfavorable than dispersed ownership.

Table 8 The effect of types of ownership of the impact of excess cash and corporate ownership on firm valuation

This table presents firm-specific regression results on the effect of types of ownership on the impact of excess cash and corporate ownership valuation for publicly listed firms on the Stockholm Stock Exchange over the period 2001–2020. The dependent variable is MTBA in regressions (1-3). In regressions (4-6) the reported values are the *t*-statistics. The *t*-statistics are calculated as the statistical difference between the coefficients, and significance is determined by a two-tailed Student's *t*-test. Standard errors are corrected by clustering at the firm level and reported in parentheses. The variable definitions for all variables are presented in Table 2. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively. Though not reported, all regressions are statistically significant and include industry and year indicators and an intercept term.

	[A]	[B]	[C]	[A] vs [B]	[A] vs [C]	[B] vs [C]
	(1)	(2)	(3)	(4)	(5)	(6)
FAMILY = [A]						
INSTITUTIONAL = [B]						
WIDELYHELD = [C]						
XCASH	1.013*** (0.254)	2.400*** (0.794)	0.766 (0.573)	-1.664*	0.394	1.669*
OWN	-0.409** (0.192)	0.00595 (0.456)	-1.018** (0.438)	-0.839	1.273	1.619
XCONT	0.116 (0.199)	-0.443* (0.251)	0.491 (0.700)	1.745*	-0.515	-1.256
SIZE	-0.054** (0.022)	0.026 (0.031)	-0.096*** (0.024)	-2.133**	1.304	3.147***
ASR	0.446*** (0.056)	0.662*** (0.204)	0.752*** (0.072)	-1.021	-3.353***	-0.416
RD	0.716 (0.739)	1.507** (0.718)	1.081*** (0.366)	-0.768	-0.443	0.529
CAPEX	0.547 (0.418)	0.0526 (0.550)	1.215*** (0.396)	0.716	-1.160	-1.715*
LEV	-0.0268 (0.092)	-0.274 (0.466)	0.303 (0.195)	0.520	-1.529	-1.142
<i>N</i> observations	524	102	337			
Adj. R-squared	0.497	0.584	0.632			
<i>N</i> firms	98	34	91			

Examining research and development expenses and capital expenditures to explore investment decisions across the types of ownership reveals interesting results. Firstly, the investment decisions of family firms are viewed as having an insignificant impact on the firm valuation by capital markets. This suggests that there is a high probability of consumption of private benefits of control in family firms. Secondly, I reach similar conclusions to those of family firms for institutional-controlled firms. However, research and development expenses has a significant relationship with firm valuation in these firms. Thirdly, the investment decisions in widely held firms are all valued positively by capital markets.

The results of the investment decisions and excess cash might explain the value of excess cash. One argument for the insignificant coefficient for excess in widely held firms might be that investment decisions are positively significant. This indicates that capital markets do not value excess cash because it is, on average, more likely to be allocated effectively by the managers and positively impact the firm valuation. Unlike in family- and institutional-controlled firms, capital markets value excess cash because it limits the controlling shareholders from allocating it inefficiently.

6. Conclusion

In this paper, I investigate two dimensions of corporate cash holdings on firms listed on the Stockholm Stock Exchange from 2001–2020. Firstly, I examine the determinants of corporate cash holdings from the perspective of three motives – transaction costs, precautionary, and agency. I observe strong evidence for all three motives. My results indicate that firms with more investment opportunities and smaller firms tend to hold more cash. Firms with controlling shareholders and high institutional block holdings tend to hold less cash. The effect of controlling shareholders is more pronounced when the controlling shareholder is a family.

Secondly, I explore the impact of excess cash and corporate ownership on firm valuation. The analysis is mainly aimed at investigating the effect of controlling shareholders. My results indicate that, on average, firms with controlling shareholders hold less than optimal levels of cash, while widely held firms hold more than optimal. Examining the impact of excess cash on firm valuation reveals that capital markets view excess cash as more valuable in firms with controlling shareholders, and the effect is more pronounced in institutional-controlled firms. The impact of excess cash is insignificant in firms with dispersed ownership. However, coupling these insights with the impact of investment decisions on firm valuation illustrates an alternative view of the value of excess cash. I observe that the impact of excess cash on firm valuation is significant when the relationship between investment decisions and firm valuation is insignificant. This indicates that capital markets view excess cash as valuable in firms with controlling shareholders because investors perceive that investments performed by these shareholders are allocated ineffectively, possibly due to the consumption of private benefits of control. This relationship is most noticeable when comparing family-controlled firms to widely held firms.

My results expand the discussion regarding the impact of capital ownership and excess control on firm valuation. Unlike prior research, I do not observe a relationship between firm valuation and excess control. However, I find a negative association between capital ownership and firm valuation. The relationship is most pronounced in firms with dispersed ownership, suggesting the capital markets reflect that agency problems are marginally less severe in firms with controlling shareholders.

As Adams and Ferreira (2008) expressed, is the true value of private benefits of control reflected by the capital markets in Sweden? My analysis provides indirect insight into the existence of the private benefits of control as reflected in the firm valuation, particularly in firms with controlling shareholders and shares with differential voting rights. Therefore, I cannot fully reject the statements by the CSE and Investor et al. (2020) about the benefits of the Swedish corporate governance structures. However, future research should aim to directly examine the value of private benefits of control to determine the extent of wealth expropriation by controlling shareholders in Sweden.

7. References

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