Skin In The Game Puts Cash To Its Aim

A study on Insider Ownerships impact on a firm's cash holdings and its capital allocation decisions

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Abstract

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Five Keywords: Cash Holdings, Insider Ownership, Capital Allocation, Agency Theory, Nordic Governance Model

Purpose: This study investigates the relationship between insider ownership, corporate cash holdings, and capital allocation decisions on publicly traded firms in the Nordic region.

Methodology: For our panel data, we employ POLS and Fixed Effects estimation models with standard errors clustered by firms to test the study's hypothesis. To investigate capital allocation of excess cash, interaction terms between insider ownership and excess cash are generated to test for the partial effect of insider ownership of excess capital spending on capital allocation. Lastly, the results are subject to several robustness checks.

Theoretical Perspectives: The theoretical foundation revolves around Agency Theory, complemented by theoretical motives for cash holdings. Moreover, the Nordic Governance Model provides a comprehensive review of Nordic Governance and its implications.

Empirical Foundation: The sample universe consists of annual data for publicly traded firms on the main exchanges in the Nordic region from 2009 to 2023. The total sample consists of 6606 firm-year observations from 772 unique Nordic firms.

Conclusion: This study finds a negative relationship between insider ownership and corporate cash holdings. Additionally, we show that low insider ownership reduces the spending of excess cash on acquisitions while it increases the allocation of excess cash to shareholder distributions. Furthermore, high insider ownership increases spending of excess cash on capital expenditures. Lastly, our results show that when investment opportunities are limited, dividends can be viewed as either a substitute for active governance or a consequence of efficient management.

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1. Introduction

1.1 Background

On June 3rd 2023, Viaplay's CEO Anders Jensen announced that the company had run out of cash and had to reduce its financial estimates significantly. Despite a profitable core business, expensive expansion plans and excessive spending on capital expenditures together with disappointing acquisitions led to a depletion of Viaplay's cash reserves. On the day of the announcement, shareholders of Viaplay saw their share drop by more than 72%. In the aftermath of the scandal, much of the criticism was directed at the management and board team and the lack of insider ownership within the company. A lack of personal commitment in the management led to expensive and poor investments that, in the end, the shareholders had to pay for (Wendel, 2023; Axelsson, 2023). To put it short, management was spending money knowing that the shareholders were paying the bill.

The Viaplay example is a recent example of many, displaying the classic agency-principal conflict where the firm's separation between ownership and control incurs costs for its shareholders. In 1986, Michael Jensen published his article *Agency Costs of Free Cash Flow, Corporate Finance and Takeovers,* which has become one of the most influential articles on the agency-principal conflict. First of all, Jensen predicts that managers, if given the chance, will accumulate excess cash to maximize their own flexibility in business decisions. Secondly, Jensen predicts that excess cash will be spent on excess capital expenditures and acquisitions, which reduces shareholder wealth. These predictions have led to the notion that high cash holdings are value-destroying and that large cash reserves will be suboptimally spent (e.g., Harford, 1999; Dittmar & Smith, 2007; Clifford, 2008).

One potential solution to this agency-principal conflict is to engage managers to own shares to align incentives with the shareholders. By aligning the management's incentives with its shareholders, managers are more incentivized to allocate capital that maximizes shareholder value, consequently leading to optimizing capital allocation and decision-making (Han and Suk, 1998; Denis and McConnell, 2003; Park and Jang, 2010).

1.2 Problem Discussion

Previous scholars predominantly focus on corporate governance in a broad sense and its impact on cash holdings and capital allocation. Despite previous studies on the specific relationship between insider ownership, cash holdings, and capital allocation of excess cash, the forefront of academic research has failed to reach a consensus on several important research areas.

First, Jensens' (1986) hypothesis regarding the separation between principals and agents has been extensively studied in the context of insider ownership[1] and corporate cash holdings. Numerous research has found results consistent with Jensen's hypothesis, showcasing that managers with low insider ownership are more likely to build up cash reserves. Ozkan and Ozkan (2004) and Gkillas et al. (2020) studied the British stock markets and found that managerial ownership and cash holdings correlate negatively. However, studies on the US stock market have yielded contradictory results, finding that insider ownership has an insignificant or even positive effect on cash holdings (Opler et al., 1999; Harford et al., 2008). Previous scholars have argued that the relationship between insider ownership and cash holdings largely depends on the regulatory framework and country-level shareholder rights (Ozkan and Ozkan, 2004; Harford et al., 2008). According to Harford et al. (2008), entrenched managers cannot build large cash reserves given the strong shareholder protection in the US. Instead, managers whose incentives are perceived to be aligned with shareholders are rewarded with the trust of accessing accumulated funds, while self-interested managers hold lower cash levels to reduce takeover threats (Faleye, 2004; Harford et al., 2008). After thorough research, no empirical studies have investigated the Nordic stock market. The Nordic region offers a regulatory framework that consistently ranks among the strongest shareholder protections in the world (World Bank, 1996; La Porta et al., 2000; Lekvall, 2014). Therefore, investigating whether the relationship between insider ownership and cash holdings is characterized by strong shareholder rights or by the traditional agency theory presented by Jensen (1986) is essential to understanding this complex interrelation.

Secondly, while the literature on managerial ownership and cash holdings is relatively extensive, there is relatively scarce literature on how insider ownership affects the allocation of excess cash. Instead, the literature has predominantly focused on corporate governance in

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[1] Insider Ownership and managerial ownerships are used interchangeably

general rather than insider ownership's effect on capital allocation. Regardless, the empirical findings stem from the same theoretical arguments regarding agency problems. Bliss and Rosen (2001) find that managers pursue self-serving projects when left unmonitored. They conclude that this suboptimal spending, e.g., empire building, reduces shareholder value. Jiraporn et al. (2006) extend this argument and argue that when managers are less accountable to minority shareholders, they are more inclined to pursue private benefits. Although they do not look particularly at insider ownership and cash allocation, they show that corporate governance policies, to a great extent, can explain capital allocation strategies among managers. Furthermore, Harford et al. (2008) shed light on the relationship between managerial ownership, corporate governance, and capital allocation. Their study reveals that firms with better corporate governance spend less on acquisitions and capital expenditures and instead distribute money back to shareholders through dividends. However, their study found no significant effect on the insider ownership variable on capital allocation (Harford et al., 2008). Despite this, their findings help to understand how managerial ownership shapes capital allocation strategies. The relatively scarce empirical literature on the interrelation between insider ownership and cash holdings underscores the need for further research.

Lastly, one aspect that remains largely unexplored in the literature is whether firms with high insider ownership implement different capital allocation strategies when investment opportunities are limited. Opler et al. (1999) investigate capital allocation in firms with good and poor investment opportunities. They find that firms with poor investment opportunities consistently spend more excess cash on acquisitions and capital expenditures than dividend payments. They argue this is puzzling since the absence of profitable investment opportunities should lead to significantly higher shareholder distributions than new investments. The authors claim that one potential explanation for these results is agency problems of entrenched management and mention this as a point of further research. Furthermore, Dittmar and Marth-Smith (2007) investigated managerial ownership and the marginal value of cash holdings. The authors conclude that the marginal value of one dollar is only 0.42$ in poorly governed firms, whereas 0.88$ in strongly governed firms. The authors argue that there is a considerable risk that self-servicing managers make suboptimal spending decisions, resulting in a depletion of the marginal value of a dollar. Although they do not look specifically at what the excess cash is spent on, they provide valuable insights into suboptimal cash allocation in poorly governed firms.

1.3 Purpose & Research Question

This study investigates the interplay between managerial ownership and corporate cash holdings. Extending on this, this paper explores how insider ownership affects capital allocation of excess cash. Last of all, this paper seeks to build upon previous literature on capital allocation to investigate if insider ownership affects capital allocation in firms with limited investment opportunities. The Nordic region, consisting of Sweden, Norway, Finland, and Denmark[2] provides a robust market to explore this relationship due to its strong commitment to corporate governance principles (Lekvall, 2014; Thomsen, 2006). With this in consideration, the following research questions are formulated:

- How does managerial ownership affect corporate cash holdings?
- What implications does insider ownership have on the capital allocation of excess cash? More specifically, how does insider ownership affect the allocation of excess cash on acquisitions, capital expenditures, and shareholder distributions?
- How does managerial ownership influence capital allocation of excess cash in firms with limited investment opportunities?

1.4 Main Findings and Contribution

To our knowledge, this is the first study on insider ownership, corporate cash holdings, and capital allocation decisions in a Nordic setting. Our results contribute to several important aspects regarding managerial discretion and cash management. Firstly, we find a negative relationship between insider ownership and cash holdings. These results differ from previous studies on markets with such a strong corporate governance model. Therefore, alternative explanations other than regulatory aspects should be considered to explain the relationship between insider ownership and cash holdings. Secondly, we show that low insider ownership reduces the spending of excess cash on acquisitions while it increases the allocation of excess cash to shareholder distributions. Furthermore, high insider ownership increases spending of excess cash on capital expenditures. Combining these findings suggests that managers with high insider ownership are rewarded with more flexibility, while low insider managers are met with fiscal discipline.

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[2] Iceland is excluded due to limitations in data collection.

Lastly, our results show that when investment opportunities are limited, both firms with the lowest insider and highest insider ownership increase distributions of excess cash to shareholders. This indicates that shareholder distribution serves both as a way for aligned managers to increase shareholder value and as a disciplinary tool for weakly governed firms. These findings underscore the importance of understanding the relationship between corporate governance and capital allocation decisions. Our results highlight the role of insiders in building more effective governance structures to enhance credibility and minimize the transaction costs related to fiscal discipline. By understanding the relationship between insider ownership, cash holdings, and capital allocation, we believe that both investors and regulators can improve decision-making related to corporate governance.

1.5 The Nordic Corporate Governance Model

Previous studies on the agency-principal conflict have shown that the overall regulation and level of corporate governance are of essential importance for how insider ownership influences cash holdings and capital allocation (La Porta et al., 2000; Ozkan and Ozkan, 2004; Harford et al., 2008). The Nordic Corporate Governance model is based on Scandinavian civil law, and the frameworks are generally very similar (Lekvall, 2014). The model is generally well known for its strong law enforcement and consistently ranks among the strongest shareholder protections in the world (World Bank, 1996; Lekvall, 2014; Nordisk Bolagsstyrning, 2018).

According to Lekvall et al. (2014), an important characteristic of the Nordic Corporate Governance model is a large number of controlling owners. Moreover, this characteristic creates long-term perspectives, successfully making the Nordic region one of the wealthiest economies in the world. However, he also points out some general concerns with markets characterized by many controlling owners. A potential concern could be that controlling owners exploit minority shareholders by making decisions that only favor the controlling shareholder. However, Nenova (2003) demonstrates that controlling shareholders in the Nordic region are significantly less able to exploit minority shareholders than in countries with Anglo-Saxon, German, or French civil law models. Nenova explains that the high quality of law and law enforcement to minority shareholder protection creates a landscape with strong shareholder protection.

Another potential concern Lekvall (2014) raises with the large part of controlling shareholders in the Nordics is that long-term ownership might restrict the ability to complete hostile takeovers in the case of managerial entrenchment. However, Skog (2004) shows that takeover bids on the Stockholm Stock Exchange had a significantly higher acceptance rate than other European markets. Although Skog's findings are based on the Swedish equity market, Lekvall (2014) argues that these findings apply to the Nordic corporate governance system as a whole. This shows that despite strong and long-term owners, the regulatory landscape still allows market discipline to replace self-interested managers.

1.6 Outline of Paper

The structure of this paper is as follows: Chapter two provides the reader with a theoretical ground and a comprehensive literature review. The Chapter ends with the hypothesis development. Chapter three reviews the data sample and provides summary statistics of the main variables. Chapter four covers the study's methodology and raises potential concerns regarding endogeneity and heteroskedasticity. Chapter five goes over the empirical findings. Chapter six provides the reader with an analysis of the main findings through the scope of the theoretical and empirical literature. Chapter seven concludes the main findings, discusses limitations, and provides suggestions for further research.

2 Literature Review and Hypothesis Development

This Chapter presents the main theoretical and empirical findings within the research area, which motivates the research hypothesis. To our knowledge, no previous research exists on the relationship between corporate cash holdings, excess cash spending, and managerial ownership in a Nordic context, so we cover relatable studies.

2.1 Theoretical Framework

2.1.1 Theoretical Motives for Holding Cash

Two of the most important concepts for why firms would hold excess cash are the Transaction Cost Motive and the Precautionary Motive, established by Keynes (1936). The Transaction Cost Motive assumes that firms hold cash to fund necessary operations and invest in profitable investments when external financing is costly or unavailable. Moreover, firms hold cash to save on the transaction costs of liquidating assets or raising external capital. The motive for cash holdings stems from the benefits of avoiding transaction costs when raising new capital or liquidating assets. To this, firms hold cash only to avoid the higher opportunity costs related to cash shortfalls (Tobin, 1956; Miller and Orr, 1966; Dittmar et al., 2003). Denis and Sibilkow (2010) show that the value of excess cash is larger in smaller firms, which generally have greater growth opportunities but less access to capital markets.

The precautionary motive revolves around the theory that cash holdings enable firms to handle unexpected costs (Keynes, 1936). By building up a cash reserve, firms can avoid experiencing financial distress during temporary cash shortfalls. This differs from the transaction cost motive, as cash is seen as a risk management tool rather than a financing source. Milidonis and Stathopoulos (2014) expand upon the precautionary motive and find that managers for firms with high firm-specific risk are more risk averse in their capital allocation decisions even when the shareholders incentivize them to take on risk. This displays a dilemma where investors can diversify their investments, but managers have less options for doing so and, therefore, hold cash out of risk aversion. Managers inability to diversify and the consequent risk aversion might lead them to obey profitable investment if the perceived risk is too high (Milidonis and Stathopoulos, 2014).

2.1.2 Agency Theory

The agency theory is one of the most prominent theories within corporate finance literature. The theory explores the relationship between separation and control and highlights the problems that arise when both parties, management (agent) and owners (principals), pursue utility maximization (Jensen & Meckling, 1976). The framework shed light on the principal's problem of delegating the decision-making authority to the agent on their account, creating an opportunity for the management to exploit shareholders at their expense. Consequently, agency costs arise, including monitoring of the agent, alignment of interests, and residual costs - all of which stem from the information asymmetry and uncertainty that the relationship gives rise to (Jensen & Meckling, 1976). Central to this view lies the assertion that the discord of interests between agents and principals tends to be most pronounced within firms with substantial free cash flow where management can accumulate cash to maximize their flexibility (Jensen, 1986). Due to information asymmetry between managers and shareholders, shareholders often cannot identify which investments are profitable and which are made for managers' personal gain. To address this concern, Jensen proposes that shareholders should enforce fiscal discipline and restrict management's access to cash, for example, by requiring dividends of excess cash. Previous literature has extensively discussed two effects of insider ownership on cash holdings and capital allocation. These effects are the Alignment effect and the Entrenchment effect.

2.1.2.1 Alignment Effect

The alignment effect predicts that the incentives of managers with large insider ownership will be more aligned with the ones of shareholders' incentives than those of managers with no insider ownership (Denis and McConnell, 2003). In this scenario, insiders are more inclined to pursue value-adding projects instead of overinvesting or exploiting minority shareholders in favor of private benefits. However, in previous literature, the alignment effect has been interpreted differently regarding how insider ownership affects cash holdings and capital allocation.

Considering the cost of holding cash, one common notion in previous literature has been that the alignment effect predicts a negative relationship between cash holdings and insider ownership (Ozkan & Ozkan, 2004; Opler et al., 1999). By aligning interests, managers will likely distribute excess cash back to shareholders rather than building up cash reserves for managerial flexibility or unprofitable investments. Dittmar and Smith (2007) show that the

value of excess cash is generally low and that managers aligned with their shareholders should distribute the excess cash back to their shareholders when other investment opportunities are scarce. Ozkan and Ozkan (2004) further argue that the firm's ability to raise external financing increases due to the reduction of agency costs, which ultimately reduces firms' incentives to hold excess cash on their balance sheets.

Conversely, some scholars have argued that larger insider ownership signals alignment with the firm's shareholders, which consequently leads to more trust from shareholders to steward accumulated funds and less need for fiscal discipline (Prencipe, Bar-Yousef, Mazzola and Pozza, 2011; Ferinha and Foronda, 2009). Harford et al. (2008) refer to this interpretation of the alignment effect as the flexibility hypothesis, i.e., managers perceived to be aligned with their shareholders are rewarded with greater flexibility in their cash holdings and capital allocation decisions, leading to larger cash holdings.

2.1.2.2 Entrenchment Effect

The entrenchment effect revolves around when a firm has concentrated ownership (e.g., large insider owners), the controlling owner can exploit wealth from minority owners (Shleifer and Vishny, 1997). Morck, Shleifer, and Vishny (1988) find a concave relationship between managerial insider ownership and firm performance. They show that firm value improves with a higher degree of managerial ownership, but only until a certain point, when managers become entrenched and expropriate outside investors for private benefits. Couzoff, Banerjee, and Pawlina (2022) studied the managerial entrenchment effect on cash policies and found that managerial entrenchment led to delayed payouts to shareholders, resulting in higher corporate cash holdings. Additionally, the marginal value of cash drops as managers become more entrenched (Couzoff et al., 2022). A possible explanation is that managers can extract more rent from their decision-making power over time when they become irreplaceable. Examples of this are overinvestments in negative net present value projects. Shleifer and Vishny (1986) argue that concentrated ownership may lead inside owners to prioritize their interests, resulting in inefficient and imperfect governance structures.

2.1.3 Empire Building

An extension of the agency theory is the theory of empire building, which refers to the actions undertaken by management to increase the scope and size of the firm (Kanniainen, 2000). This is often done beyond what is considered optimal for shareholder wealth. The source of the problem stems from the misalignment of incentives and information asymmetry, as noted above. From an agency theory point of view, empire-building can lead to several adverse outcomes: (1) Entrenchment, (2) Value destruction, (3) Risk-taking, and (4) Agency costs. Risk-taking involves managers taking on excessive leverage or risk beyond optimal levels, increasing the risk of costs associated with financial distress. Value destruction revolves around managers ineffectively allocating resources towards empire-building, learning to value destruction for shareholders. In summary, empire-building reflects a classic agency problem highlighting the importance of strong corporate governance to mitigate the conflicts between managers and shareholders (Kannianinen, 2000).

2.2 Empirical Literature

2.2.1 Insider Ownership and Cash Holdings

Dittmar, Marth-Smith, and Servaes (2003) studied corporate cash holdings and corporate governance in a sample of 11,594 companies from 45 countries (predominantly European countries) in 1998. The authors use shareholder rights as a proxy for agency costs and corporate governance and find a significantly negative relationship between shareholder rights and corporate cash holdings[3]. Anderson and Hamadi (2006) studied managerial ownership and corporate cash holdings on 717 Belgian firm observations from 1991-1996. They found that firms with controlling insider owners will likely have higher cash holdings. Anderson and Hamadi (2006) argue that the relationship between managerial ownership and corporate cash holdings is a consequence of risk aversion often found by poorly diversified owners. Moreover, they suggest insiders benefit from higher cash holdings, as they can pursue more private benefits. Although the two studies have differing corporate governance measures, their study supports why one could expect alternating relations between insider and cash holdings.

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[3] The authors deploy a LLSV (1998) measurement as a proxy for shareholder rights. See Dittmar, Marth-Smith, and Servaes (2003) for further explanation on the measurement.

Opler et al. (1999) studied the determinants and implications of corporate cash holdings on U.S. publicly traded firms from 1971 to 1994. They find managerial ownership positively affects cash holdings up to 5% of insider ownership but does not increase after that threshold. These results are consistent with managerial risk aversion found by Drobertz and Grüninger (2007). They argue that their findings can be explained by the excessively strong impact of the precautionary motive on cash holdings and managerial ownership (Opler et al., 1999).

Ozkan and Ozkan (2004) deploy a cross-sectional regression investigating the determinants of corporate cash holdings on a sample of 839 UK firms from 1984 to 1999. Among other variables, their study focuses on managerial ownership and cash holdings. Their study reveals a non-monotonic (U-shaped) relationship between corporate cash holdings and managerial ownership. They argue that the alignment effect dominates when managerial ownership increases up to 24%, but then the entrenchment effect dominates as managerial ownership increases up to 64%. Subsequently, as managerial ownership surpasses 64%, cash holdings start to fall as the alignment effect kicks in. Their results reveal that the agency theory successfully explains corporate cash holdings up to 64 % insider ownership. They explain that large cash holdings protect entrenched managers from outside pressure and allow them to pursue private benefits at the expense of minority shareholders. Furthermore, the authors argue that their results differ from those of the US market due to inefficient market discipline and a lack of efficient monitoring due to high institutional ownership.

Harford et al. (2008) investigate corporate governance and firm cash holdings on a sample of 11,645 firm-year observations of U.S. publicly traded firms from 1993 to 2004. Contrary to international studies (Ozkan and Ozkan, 2004; Opler et al., 1999; Dittmar et al., 2003; Kim, Mauer, and Sherman, 1998), the authors find that firms with high insider ownership tend to accumulate more cash than firms with low insider ownership. Their results shed light on country-level shareholder rights and their interaction with firm-level agency problems. Their results imply that the managerial entrenchment effect is less pronounced in countries with stronger shareholder protection (Harford et al. 2008). Another possible explanation is that management spends excess cash to protect themselves from proxy contests or hostile takeovers (Faleye, 2004; Harford et al., 2008).

2.2.2 Insider Ownership and Capital Allocation

There are essentially four ways management can manage cash: invest in capital expenditures, distribute it to shareholders, make acquisitions, and hold onto the cash (Opler et al., 1999). Few researchers look at the particular interplay between insider ownership and cash allocation but rather investigate the broader relationship between corporate governance and cash allocation.

Harford et al. (2008) investigate how governance metrics (including insider ownership) relate to future investment decisions. Their findings conclude that firms with weaker shareholder rights invest more in capital expenditures. In economic terms, they find that firms with weaker corporate governance spend 1.6 % more on capital expenditures. Moreover, they find that firms with weaker governance invest more in acquisitions. Regarding distribution to shareholders, dividends increase for firms with stronger corporate governance, which indicates a long-term commitment to payouts (Harford et al. 2008). Again, their findings suggest that country-level shareholder rights and corporate governance structures are more important than firm-level agency problems, which aligns with international studies (La Porta et al., 2000; Dittmar et al., 2003). Bliss and Rosen (2001) find that CEOs are heavily compensated after mergers and acquisitions, even though these investments are value-destroying. Their findings reveal that weakly controlled managers tend to spend more cash on acquisitions and/or capital expenditures, which is supported by the findings of Harford et al. (2008). Harford and Li (2007) find similar support that regardless of the outcome of mergers and acquisitions (successful or not), CEO wealth increases while shareholder value decreases. Bliss and Rosen (2010) and Harford and Li (2007) show that CEOs have strong incentives to pursue acquisitions, even though they are value-destroying, and this is a sign of entrenchment.

Harford et al. (2008) further argue that entrenched managers experience a trade-off between building up large cash reserves to maximize future flexibility and the costs of potential market disciplinary actions. Faleye (2004) and Pinkowitz (2002) illustrate that firms with large cash holdings are more likely to be targeted by takeover bids. To defend themselves, Faleye shows that managers reduce their cash levels by paying out special dividends, making them less targetable for takeovers. Other possible defenses utilized by firms with excess cash are acquiring a competitor, buying back shares, or acquiring the potential bidder itself

(Bagwell, 1991; Stultz, 1988; Dann and DeAngelo, 1988). Given the trade-off between strong incentives of managerial flexibility and possible disciplinary actions of large cash holdings, weakly controlled managers prefer to spend cash on acquisitions and capital expenditures rather than hold on to them (Bliss and Rosen, 2001; Harford and Li, 2007).

Officer (2006) studies poorly and well-governed firms in the U.S. stock exchange and how their dividend policies differ. Officer finds that firms with poor governance and strong governance are significantly more likely to distribute excess cash to shareholders than those with average governance systems. His interpretation of the results is that shareholders, on the one hand, can force poorly governed firms to pay dividends as a substitute for poor monitoring, but that firms with active governance. On the contrary, firms with strong governance over time should be able to minimize agency conflicts and excess cash. Therefore, excess cash should be redistributed over time if no other investment opportunities exist.

Lastly, Farinha and Foronda (2009) studied how insider ownership affects dividend policies in Anglo-Saxon and European corporate governance systems. The authors suggest that minority shareholder protection in Europe is generally weaker than in Anglo-Saxon systems. Due to the weak minority shareholder protection, the conflict between minority and controlling shareholders shapes dividend payout decisions. Farinha and Foronda argue that dividend payment can signal alignment between minority-and-controlling shareholders and that higher insider ownership increases dividend payments in European countries. This differs from how insider ownership affects dividend policies in Anglo-Saxon countries. The authors argue that given the strong shareholder protection in Anglo-Saxon corporate governance models, there is little risk of exploitation of minority shareholders by controlling owners. The effect of insider ownership is, to a greater extent, determined by traditional arguments between agents and principals. The authors' findings show that insider ownership has a negative effect on shareholder distributions since higher insider ownership leads to less need for fiscal discipline. Farinha and Forona (2009) conclude that this is a consequence of strong shareholder protection. Consequently, shareholders award management with the trust of stewarding accumulated funds when managers and shareholders' interests are aligned.

2.2.3 Insider Ownership, Capital Allocation and Investment Opportunities

Opler et al. (1999) explore whether excess cash holdings affect corporate spending when investment opportunities are limited. The authors measure excess cash and analyze the spending patterns t_{+1} to see how they relate to the positive excess cash in year t. To proxy a firm's investment opportunities, they divide their sample into low Market-To-Book (MTB) and high MTB. They then analyze the cash spending on capital expenditures, acquisitions, shareholder payments, and operating cash flow. Their findings reveal that high and low MTB firms consistently increase their spending on capital expenditures and acquisitions when excess cash is available. Interestingly, firms with low MTB and consequently lower expected investment opportunities increase their spending on capital expenditures and acquisitions as much as firms with high MTB when they access excess cash. The authors argue this is irrational given the inferior investment opportunities of low MTB firms and claim agency problems are likely to explain these results.

Payments to shareholders (measured as the sum of cash dividends and stock repurchases) do not seem to correlate with excess cash for high MTB companies (Opler et al., 1999). Notably, they find that dividend payments increase as much as acquisitions and capital expenditures when managers access excess cash. Opler et al. (1999) argue that dividends should increase more than acquisitions and capital expenditures and, again, suggest that the outcome of their study stems from firm-level agency problems. La Porta (2000) argues that there are two perspectives on governance and dividend payments. On one hand, pressuring managers to pay dividends can limit managers' ability to engage in wasteful spending. Hence, dividends are a substitute for governance. On the other hand, well-governed firms tend to pay out residual cash flows to maximize shareholder value (La Porta, 2000). These findings are consistent with the theory of Jensen (1986), which suggests that fiscal discipline can replace the need for active monitoring of managers.

Blanchard, Lopez-De-Silva, and Shleifer (1994) conducted a study on 11 firms with poor investment opportunities (given by their low Tobin's Q) that have received cash windfalls (e.g., won or settled a lawsuit). The authors concluded that managers tend to retain cash rather than distribute it to shareholders via dividends or share repurchases and instead acquire related and unrelated businesses. The authors suggest that if the managers hold on to the cash, another company will eventually acquire them after a few years. Therefore, managers hold on

to cash and invest it in unattractive projects to ensure long-run survival rather than giving up cash or having outsiders claim it. Their results support the agency theory of free cash flow and entrenched managerial behavior. While their sample size is too small to make any definite conclusions, their results point toward the desire for managers to entrench themselves and find support for the agency theory (Blanchard et al., 1994).

2.3 Hypothesis Development

2.3.1 Does Managerial Ownership Affect Cash Holdings?

Despite the established hypothesis that self-interested managers build up large cash reserves to maximize personal flexibility presented by Jensen (1986), previous literature has yielded mixed results on how insider ownership affects cash holdings. A central theme in the studies mentioned above has been that the regulatory landscape of shareholder protection plays a pivotal role in the relationship between insider ownership and cash holdings. Harford et al. (2008) find that in jurisdictions with strong shareholder protection (such as the U.S.), insider ownership signals the alignment of interests between managers and shareholders, which fosters trust among shareholders and mitigates conflicts between agents and principals. This alignment often leads to shareholders allowing management to accumulate cash (Harford et al., 2008; Farinha and Foronda, 2009; Prencipe et al., 2011).

The Nordic Corporate Governance model combines an ownership structure of substantial controlling owners with long-term perspectives and strong regulation of minority shareholder rights (Lekvall, 2014). Given previous studies on well-governed markets, strong Nordic shareholder protection should enhance shareholders' trust since management cannot exploit minority shareholders for personal gain. Consequently, shareholders should reward managers who are large shareholders themselves with greater flexibility to accumulate cash reserves. The Nordic regulatory framework also allows for healthy limitations of takeover defenses, enabling market discipline for entrenched managers (Skog, 2004; Lekvall, 2014). Given what Pinkowitz (2002) and Faleye (2004) find, self-interested managers should reduce their cash reserves to make themselves less attractive for takeover bids. Drawing upon previous research on the subject, alongside the distinctive characteristics of the Nordic Corporate Governance model, hypotheses are formulated accordingly:

Hypothesis 1.1$_0$ Insider Ownership does not affect the level of corporate cash holdings

Hypothesis 1.1$_1$: Higher (Lower) Insider ownership increases (decreases) the level of corporate cash holdings

2.3.2 Does Insider Ownership Effect Capital Allocation Decisions?

Harford et al. (2008) argue that self-interested managers experience a trade-off between building up large cash reserves to maximize flexibility while minimizing the potential takeover threat by reducing cash holdings. The general regulatory framework is essential for entrenched managers' assessment of this trade-off (La Porta, 2000; Harford et al., 2008). In markets with strong shareholder protection, managers are more likely to spend excess cash quickly to reduce the risk of market discipline in the form of takeover bids (Pinkowitz, 2002; Faleye, 2004). Bliss and Rosen (2001) and Harford et al. (2008) demonstrate that firms with low insider ownership prioritize spending on acquisitions and capital expenditures. Therefore, based on empirical studies, coupled with the robust shareholder protection in the Nordic stock exchange and agency cost arguments, insider ownership should foster alignment of interests between managers and shareholders, thus reducing spending on capital expenditures and acquisitions. Hence, the following hypothesis is formulated:

Hypothesis 2.1$_0$: Insider Ownership does not affect firms' spending of excess cash on acquisitions

Hypothesis 2.1$_1$: Higher (Lower) Insider Ownership lowers (increases) firms' spending of excess cash on acquisitions

Hypothesis 2.2$_0$: Insider Ownership does not affect firms' spending on CAPEX

Hypothesis 2.1$_1$: Higher (Lower) Insider Ownership lowers (increases) firms' spending of excess cash on CAPEX

Farinha and Forenda (2009) suggest that markets with strong minority shareholder protection, such as the US stock exchanges, will see that higher insider ownership leads to lower dividends. This relationship occurs because robust shareholder protection reduces the need for minority shareholders to limit managerial discretion over cash holdings when they trust managers to be good stewards of corporate funds. Contrary to this, Harford et al. (2008) find that firms with higher insider ownership may increase dividends, albeit inconsistent with the hypothesis of strong shareholder protection in the US. Furthermore, if regulation efficiently allows market discipline for entrenched management teams, entrenched executive teams

might pay large dividends or buy back shares to complicate takeover bids (Pinkowitz, 2002; Faleye, 2004). Given the strong Nordic corporate governance regulation, one would expect managers perceived to be aligned with shareholders' interests to retain cash within the firm to invest in projects that create long-term shareholder value. The hypotheses are formulated accordingly:

Hypothesis 2.3$_0$: Insider Ownership does not affect firms' shareholder distributions of excess cash

Hypothesis 2.3$_1$: Higher (Lower) Insider Ownership decreases (increases) firms' spending of excess cash on shareholder distributions

2.3.3 Does Insider Ownership Effect Capital Allocation in Low-Valued Firms?

Opler et al. (1999) show that firms with few investment opportunities consistently increase spending on acquisitions and capital expenditures when they access excess cash despite their inferior investment opportunities. They argue that these findings likely result from Jensen's (1986) concept of agency costs of free cash flow and empire-building theories. Although few researchers explicitly investigate how capital allocation is affected by insider ownership when investment opportunities are limited, both Harford et al. (2008) and Blanchard et al. (1994) support the notion that poorly governed managers are more likely to invest in unprofitable projects when investment opportunities are limited. Drawing upon the literature, the hypothesis posits that higher insider ownership, in the Nordic Corporate Governance model context, mitigates spending on acquisitions and capital expenditures when the firm has limited investment opportunities. The hypothesis is formulated accordingly:

Hypothesis 3.1$_0$: Insider Ownership doesn't affect firms' spending on acquisitions in low MTB firms when access excessing cash

Hypothesis 3.1$_1$: Higher (Lower) Insider Ownership decreases (increases) spending of excess cash on acquisitions in low MTB firms

Hypothesis 3.2$_0$: Insider Ownership doesn't affect firms' spending on CAPEX in low MTB firms when accessing excess cash

Hypothesis 3.2$_1$: Higher (Lower) Insider Ownership decreases (increases) spending of excess cash on CAPEX in low MTB firms

Hypothesis *2.3* suggests that given the strong shareholder protection on the Nordic stock exchanges, shareholders would be more inclined to allow management to retain accumulated cash if incentives are perceived to be aligned. However, when firms have limited investment opportunities, a higher degree of alignment of incentives should lead to higher shareholder distributions of excess cash. Opler et al. (1999) interpret their findings that payments to shareholders increase as much as capital expenditures and acquisitions when managers access excess cash as a sign of potential agency conflicts. According to Opler et al., firms with few investment opportunities should be more inclined to increase their dividends rather than spend them on capital expenditures or acquisitions. Therefore, consistent with Jensen (1986), aligned managers with excess cash and few profitable investment opportunities should distribute excess cash to shareholders. The following hypotheses are formulated:

Hypothesis 3.3$_0$: Insider Ownership doesn't affect firms' shareholder distributions of excess cash in low MTB firms

Hypothesis 3.3$_1$: Higher (Lower) Insider Ownership increases (decreases) shareholder distributions of excess cash in low MTB firms

3. Data and Descriptive Statistics

The following Chapter provides a sample description of the data, definitions of variables, and descriptive statistics. Lastly, the correlation matrix is discussed.

3.1 Sample Description

The sample in this study consists of firms listed on the Stockholm Stock Exchange, Copenhagen Stock Exchange, Oslo Børs, and Nasdaq Helsinki spanning from 2009 to 2023. Firms listed on smaller exchanges, e.g. First North, Aktietorget and NGM are not subject to the same regulations as those on the main lists (Lekvall, 2014). Including them in the sample would therefore lead to potentially biased estimates.

Ownership and financial data were collected from S&P Capital IQ[4]. Capital IQ was chosen due to its high accuracy and credibility. The dataset is constructed as unbalanced panel data containing time series and cross-sectional elements. The raw data contains 13,526 firm observations. This includes survivors and nonsurvivors who appeared in Capital IQ at any time in the sample period. However, delisted companies that did not appear in Capital IQ during the time period have been collected manually. Moreover, financial services and real estate firms have been excluded due to the regulatory landscape in which financial firms operate (Harford et al., 2008). Also, firms in the industry utilities have been excluded, following prior literature (Harford et al., 2008; Opler et al., 1999). Lastly, firms with missing key financial data have been excluded, resulting in a final sample size of 7 378 firm observations from 772 unique firms. The time frame of 2009-2023 was chosen primarily because all years include the financial data necessary to investigate the relationship. Moreover, the time period presents a comprehensive coverage of the firms on the Nordic Stock Exchanges, capturing both short-term fluctuations and long-term trends.

Appendix 1 provides the summary statistics by industry (ICB). To assert adequacy of accounting for industry-specific elements, it is required that at least 30 firms are present within the industry to incorporate it into the analysis (Harford et al., 2008). However, no industry exhibits less than 30 observations so no industry will be excluded from the analysis. Notably, industrials is the largest industry representative of this. Appendix 2 includes firm

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[4] Capital IQ is a market intelligence platform providing financial information from over 99 % of global financial markets.

observations by year. Firm observations increase for every year in the sample period. This is due to the availability of data and the fact that more firms have been added to the listing than removed during the time frame. Moreover, many firms were listed during 2020-2023, as shown in Appendix 2. Lastly, Appendix 3 provides an overview of the distributions of firms by country. Swedish firms constitute 44% of the data, while Denmark reports the fewest firms.

3.2 Variable Definition

3.2.1 Dependent variable

The dependent variable for Hypothesis *1* is **Cash Holdings**, defined as the ratio of total corporate cash and short-term liquid investments over total assets. There are various ways of defining cash holdings in prior literature. Opler et al. (1999) and Harford et al. (2008) define cash holdings as the logarithm of cash to net assets. They argue that the log of cash will reduce the skewness of the variable. More recent research has a more traditional measure of cash holdings: cash scaled by total assets (Bates, Kahle, and Stulz, 2009; Ozkan and Ozkan, 2004). We do not want to artificially manipulate the data, so this paper will employ the same definition as Ozkan and Ozkan (2004). By implementing this definition, the dependent variable can stay in its true form, albeit this may lead to skewness in the variable. A robustness test of logged cash holdings will be performed to ensure our results are robust to alternative definitions (see section 4.3).

Acquisition Intensity will be used as a dependent variable when testing Hypotheses *H:$_{2.1}$* and *H:$_{3.1}$*. In Hypothesis *H:$_{3.1}$*, acquisition activity will be tested in the context of low MTB. Acquisition activity will be defined as the annual change in acquisition, scaled by total assets. Harford et al. (2008) argue that there are several reasons to focus on the change in acquisition activity rather than using the actual ratio between acquisitions and total assets. First, firms tend to have predetermined investment ratios, leading to little variance in the acquisition over total assets ratio. Secondly, dependent variables such as acquisitions might be co-determined with corporate governance measures. To circumvent the co-determination, Harford et al. (2008) suggest that the annual change in investments relative to the lagged insider variable mitigates this problem. However, acquisition intensity will be included as a control variable in the first regression, expressed as the actual ratio between acquisitions and total assets similar to previous studies (Harford et al, 2008; Opler et al, 1999).

Capex Intensity will be used as a dependent variable when testing Hypotheses $H{:}_{2.2}$ and $H{:}_{3.2}$. Capex intensity will be defined as the annual change in cash outflow associated with capital expenditures divided by total assets. Following this paper's Hypothesis, firms with high insider ownership and poor growth opportunities are expected to invest less in capital expenditures. Again, Capex intensity will also be included as a control variable in the first regression in the actual ratio between capital expenditures and total assets (Harford et al, 2008; Opler et al, 1999).

Payments to shareholders will be used as a dependent variable when testing Hypotheses $H{:}_{2.3}$ and $H{:}_{3.3}$. Similar to Opler et al. (1999), we define Payments To Shareholders as the annual change in the sum of dividends, special dividends, and share repurchases during one year, scaled with total assets. We employ the annual change rather than absolute numbers for the above-mentioned reasons. For the first regression, payments to shareholders will not be subjected as a control variable, as it is substituted by dividends.

3.2.2 Main Explanatory Variable

The main explanatory variable in this study is **Insider Ownership**, measured as the total ownership ratio of the board and management of the firm at the end of each year in the sample period. This definition of insider ownership is commonly used in academic research (Opler et al., 1999; Ozkan and Ozkan, 2004; Anderson and Hamadi (2006); Drobertz and Grüninger (2007); Harford et al., 2008). Moreover, the paper uses annual panel data to capture potential variations in ownership and its effect on cash holdings and capital allocation. To investigate how managerial ownership affects cash holdings and capital allocation in the coming year, we employ lagged insider ownership (i.e. *t-1*).

Most previous scholars investigating insider ownership's effects segment the variable into thresholds (see Himmelberg and Hubbard, 1999; Harford et al., 2008; Opler et al., 2008). Morck, Schiefer, and Vischny (1987) argue that given that the insider variable is generally not normally distributed and distorted by outliers, dividing the variable into certain thresholds makes the results more interpretable and reduces the influence of outliers. Harford et al. (2008) utilize the bottom and top quartile of insider ownership variables to test if firms in the 1st (lowest) and 4th (highest) quartile of insider ownership influence how much cash the companies hold. Following Harford et al., we also segment insider ownership into quartiles[5].

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[5] See Appendix 4 for summary statistics of insider ownership segmented into quartiles.

Furthermore, following Harford et al. (2008), we include interaction terms as our main explanatory variables for Hypotheses 2_{1-3} and 3_{1-3}. These include the interaction between insider ownership (segmented into quartiles) and excess cash. The interaction terms we include are *Q1*CASH* and *Q4*CASH*, where the former is an interaction term between insider ownership in the 1st quartile multiplied with excess cash, and the latter is an interaction term between the 4th quartile of insider ownership and excess cash. Interaction terms have the advantage of capturing non-additive effects, i.e., they enable us to explore whether the effect of one variable on the dependent variable varies depending on a third variable. Moreover, including interaction terms can indirectly help address problems related to omitted variable bias (Bun and Harrison, 2019).

3.2.3 Financial Control Variables

The control variables collected for this study have been carefully selected following previous literature. The common denominator of these variables is that they have all been shown to greatly determine significant corporate cash holdings.

To proxy for **Size**, the natural logarithm of total assets is employed. It is believed that a firm's size will influence cash management, considering the implications firm size has on access to capital markets and economies of scale (Mulligan, 1997). Opler et al. (1999) find that larger firms are assumed to have better access to external financing and suffer from less information asymmetry. The transaction cost motive predicts that smaller firms would hold more cash to avoid transaction costs associated with raising new capital. **Leverage** is calculated by dividing the total book value of debt by the total assets. The metric reflects to which extent the firm relies on debt and equity and is an important determinator of cash holdings (Opler et al., 1999; Ozkan and Ozkan, 2004). Bates, Kahle, and Stulz (2009) suggest that firms will pay down debt when debt becomes too constraining, and the firm is too close to financial distress, hence finding that higher leverage is associated with lower cash holdings. However, Ozkan and Ozkan (2004) argue that a high debt ratio increases the risk of financial distress. Hence, firms would hold more cash to avoid financial distress.

Market-to-Book (hereafter MTB) ratio will be defined as the book value of assets and market value of equity, subtracted from the book value of equity, divided by total assets. This is the same definition used by Ozkan and Ozkan (2004) and Harford et al. (2008). MTB ratio is often considered a good proxy for future NPV-positive investment opportunities (Smith

and Watts, 1992; Jung et al., 1996; Barclay and Smith, 1995). In $H:3_{1-3}$, MTB will be divided into high MTB and low MTB to test whether low MTB firms with low/high insider ownership allocate their cash differently. The median MTB in our sample gives the threshold, following prior literature (Opler et al., 1999).

Another control variable used is **Cash Flow** over total assets. Opler et al. (1999) and Harford et al. (2008) find a positive relationship between cash flow and cash holdings. However, Ozkan and Ozkan (2004) found a negative relationship between cash flow and cash holdings, which did not align with their hypothesis. **Net Working Capital** is defined as current assets subtracted from current liabilities divided by total assets. Bates, Kahle and Stulz (2009) predict a negative relationship between net working capital and cash holdings. They argue that current assets can easily be substituted for cash. Thus, firms with higher net working capital will hold less capital.

Moreover, industry cash flow volatility is used as a control variable, defined as **Cash Flow Volatility**. Opler et al. (1999) and Harford et al. (2008) use each industry's average cash flow volatility to measure a firm's cash flow riskiness. They argue that firms in industries with large cash flow volatility are more likely to hold more cash due to a precautionary motive. However, implementing this definition would cause a static variable, which would be omitted in a Fixed-Effects model due to the absence of variability. To mitigate this problem, we take the average of the last four years of industry cash flow volatility and use this to estimate Cash Flow Volatility. Similar ways of measuring cash flow volatility have been employed by Minton and Schrand (1999) and Gkillas et al. (2020).

R&D intensity is defined as research & development expenditures scaled by sales. Bates, Kahle, and Stulz (2009) expect a positive relationship between R&D/sales and cash holdings, arguing that firms with high R&D/sales have more costs related to financial distress. The transaction cost motive is often pronounced in R&D-intensive firms. Opler et al. (1999) argue that R&D-intensive firms experience the most information asymmetry and expect a positive relationship. **Dividend Indicators** are also used as a control variable, defined as a dummy variable, which assumes the value one if the firm has paid dividends the given year, and otherwise 0. The transaction cost motive should dominate the precautionary motive, as firms that pay dividends are assumed to have better access to the capital market (Graham and Harvey, 2001).

3.2.4 Governance Control Variables

Several corporate governance variables are employed to proxy for the severity of agency costs within a firm. These measures include board size and ownership concentration (Institutional and Strategic Ownership). These variables are in accordance with previous literature (Ozkan and Ozkan, 2004; Harford et al., 2008).

A firm's **Board Size** is an important denominator of agency conflicts considering that the board composition often influences managerial incentives (Hermalin and Weisbach, 2003; Harford et al., 2008). Generally, the literature points to the fact that the degree of alignment between shareholders and managers varies with board composition and size. Harford argues that the high correlation between firm size and board size is problematic since larger companies naturally have larger boards, and the corporate governance perspective of board size is foreseen. Therefore, this study employs the same definition as Harford et al. (2008), which is board size scaled with the log of total assets.

To further control agency problems arising from ownership structure and concentration, we include **Institutional** and **Strategic ownership**. Institutional ownership is measured as the total number of shares institutions hold divided by the total number of shares outstanding. Ozkan and Ozkan (2004) argue that institutions often adopt passive forms of ownership with little interest in active governance, potentially allowing managers to hold more cash. Strategic owners are defined by CapitalIQ as owners with large holdings, long-term perspectives, and active governance. This includes family offices, sphere ownership, PE/VC firms (if ownership > 5%), and state-owned enterprises. This definition also includes insider ownership, but we manually subtract insider ownership from the variable. Shleifer and Vishny (1986) suggest that the presence of strategic shareholders mitigates agency problems related to free rider problems and managerial opportunism. However, Shleifer and Vishny argue that large shareholders can act out of self-interest, reduce managerial incentives, or suffer from poor diversification.

3.3 Summary Statistics

3.3.1 Descriptive statistics

Descriptive statistics are reported in Table 1, including all variables used in coming regressions. All continuing variables have been winsorized at the 1st and 99th percentile to reduce the distorting effect that outliers can have on the variable (Bell and Kokic, 1994). The dependent variable cash holdings report a mean value of 14.4 % and a median of 8.4 % cash to total assets. Although this indicates a slight skewness in the variable, the results are similar to what other authors with similar measurements of cash holdings have found (see e.g. Ozkan and Ozkan, 2004; Harford et al., 2008; Faleye, 2004). Furthermore, Insider ownership also indicates a skewness with a mean of 12.6% and a median of 5%. The standard deviation of 16% indicates that the data points are generally not clustered around the mean, which is also observed by the level of insider ownership ranging between 0.01% and 68%. However, these ownership statistics are in line with previous literature. For example, Ozkan and Ozkan (2004) report an insider ownership mean and median of 14.2% and 5.1%, respectively, which is very close to what we report. The MTB variable has a mean of 2.18 with a median of 1.47, which is similar to what Harford et al. (2008) reports.

Table 1: Descriptive Statistics

Variables	Mean	Median	Min	Max	SD	N
Cash Holdings	0.144	0.084	0.004	0.78	0.169	7378
Insider Ownership	0.126	0.05	0.001	0.68	0.167	7378
Size	21 148	2 321	0.673	1 647 217	74 681	7378
Net Working Capital	0.07	0.056	-0.223	0.433	0.14	7378
Cash Flow	0.04	0.072	-0.611	0.313	0.187	7378
Cash Flow Volatility	0.125	0.119	0.028	0.285	0.066	7378
R&D Intensity	0.041	0	0	0.924	0.15	7378
Market-To-Book	2.182	1.471	0.651	10.689	1.977	7378
Leverage	0.233	0.211	0	0.864	0.185	7378
Capex Intensity	0.033	0.019	0	0.191	0.039	7378
Acquisition Intensity	0.022	0	0	0.307	0.058	7378
Payments To Shareholders	0.027	0.01	0	0.201	0.04	7378
Dividend Indicator	0.569	1	0	1	0.495	7378
Board Size	6.874	6	3	14	2.455	7378
Institutional Ownership	0.301	0.277	0	0.786	0.216	7378
Strategic Ownership	0.236	0.189	0	0.851	0.221	7378

Note: The table above displays summary statistics for all the variables included in the study. While we report observations of 7378, only 6733 firm observations will be included in the first regression due to the implementation of lagged variables. The dependent variable is

3.3.2 Pearson Correlation Matrix

A Pearson correlation matrix is reported in Appendix 5. Most of the variables report the expected correlation sign. All variables are reported as they will be used in the coming regressions. One issue that could arise when there is too high a correlation between two variables is multicollinearity. For example, the variable Board size is scaled by total assets, which explains why board size and firm size are negatively correlated. A common threshold is proposed by Dormann et al. (2013), who argue that when the correlation surpasses 0.7, multicollinearity can severely distort a model's estimates. None of the variables report a correlation above 0.7, so no further tests are performed to detect or manage multicollinearity[6].

Moreover, the main explanatory variable shows a coefficient of -0.364, indicating that larger firms tend to have less insider ownership, measured as the total number of outstanding shares held by insiders. Appendix 6 shows this study's sample divided into size and insider ownership quartiles. The table confirms that larger companies have significantly less insider ownership than smaller firms. Harford et al. (2008) perform regressions where the top and lowest quartiles of insider ownership are adjusted for size to see if this affects the results. Following previous literature, this study will use size-adjusted quartiles as a robustness test, which will be further discussed in section 4.3.

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[6] Although not reported, we control the VIF values to detect multicollinearity. None of the VIF-values indicate multicollinearity.

4. Methodology

This Chapter overviews the methodology employed to fulfill the paper's purpose. We start with an overview of previous methodology for similar papers, followed by a motivation for the chosen regression technique. Lastly, we address problems related to endogeneity and heteroskedasticity under robustness.

4.1 Econometric Methodology

To carry out the tests for the Hypothesis, this study will employ various multiple regressions. Previous scholars have employed different regression models to investigate the relationship between insider ownership, cash holdings, and capital allocation. A recurring problem in previous scholars is the absence of reliable yearly insider ownership data. This has led many previous scholars to use a single year of insider ownership data and apply those data points to all of the observations (see e.g., Ozkan and Ozkan, 2004; Opler et al., 1999; Dittmar et al., 2003). Since this causes a static value for the insider ownership variable, previous research predominantly use Pooled OLS, Random Effects, and the Fama-Macbeth model as estimation models (see Opler et al., 1999; Dittmar et al., 2003; Drobertz and Grüninger, 2007; Harford et al., 2008) rather than for example the Fixed Effects models, since Fixed Effect require variation in the explanatory variable (Wooldridge, 2016).

Since this study utilizes panel data with annual observations of insider ownership, we do not have the same problem of static variables as previous scholars. Himmelberg and Hubbard (1999) argue that studies on managerial ownership tend to ignore the importance of unobserved firm heterogeneity. They suggest leveraging the panel data structure and implementing the firm Fixed-Effect model to reduce concerns relating to endogeneity issues in regression analysis when insider ownership is the main explanatory variable. Therefore, many previous scholars using panel data and insider ownership as their main explanatory variable have employed a fixed effect as their main model but also present a Pooled OLS (see Gkillas et al., 2020; Bhabra, 2007; Kaserer and Moldenhauer, 2008). We will consequently follow previous literature and present both estimation methods.

Moreover, Woolbridge (2016) argues that if results differ greatly between Pooled OLS and Fixed Effects estimations, this may indicate that regular POLS methods are affected by correlation with time-constant factors within the error term. Therefore, if results differ significantly between POLS and Fixed Effects, the Hypothesis formulated in section 2.3 will be evaluated on the results of the Fixed Effect model. Furthermore, previous researchers have hesitated to introduce an instrument variable to address endogeneity. Harford et al. (2008) argue that prior empirical literature leaves little insight into which instrument variable to use. Moreover, implementing a poor instrument variable may lead to less reliable results (Wooldridge, 2016), concluding that this paper will not include any instrument variables.

4.1.2 Pooled Ordinary-Least-Square and Fixed Effects Model

After careful consideration, in combination with this study's panel data structure, we employ both Pooled OLS and Fixed Effects models. Initially, Pooled OLS is employed, where the panel data is ignored. Instead, a Pooled OLS estimation model pools observations across cross-sectional units and time (Wooldridge, 2016). To accommodate the potential variations in the sample universe, year, country, and industry dummies are included to enable the variations to vary across the time periods. However, Pooled OLS may still suffer inefficiency and bias estimates if unobserved variables influence the dependent variable (Wooldridge, 2016).

The Fixed Effects model more accurately mitigates the risk of including unobserved heterogeneity and endogeneity. Therefore, to enhance the robustness of the regressions, the Fixed Effects model is employed alongside Pooled OLS. Unlike Pooled OLS regressions, the Fixed Effect model effectively controls for unbounded time-invariant factors, known as unobserved heterogeneity. The Fixed Effects model allows for correlation between unobserved heterogeneity and the independent variable by eliminating time-constant factors (Wooldridge, 2016). The model helps mitigate problems related to endogeneity, which results from heterogeneity bias. Thus, the Fixed Effects model produces unbiased estimators, which enhances robustness. The Hausman test reported in Appendix 7 supports using the fixed effects model, as it rejects the null hypothesis that the random effects model would be appropriate.

4.1.3 Regression models

4.1.3.1 Hypothesis 1

The first Hypothesis of this study aims to investigate how insider ownership affects cash holdings. The study employs lagged insider ownership divided by the total number of outstanding shares to test this. Control variables are described in Chapter 3 and summarized here as vectors. The first model, using Pooled OLS with controls for industry, year, and country effects, is formulated accordingly:

$$Cash\ Holdings_{i,t} = \beta_0 + \beta_1 Insider_{i,\ t-1} + \beta_2 \sum(Control\ Variables) + year,\ indu\ \&\ country + \varepsilon_{i,\ t}$$

Model (1)

To increase the interpretability of the impact of insider ownership, we re-estimate model (1) using insider ownership segmented into quartiles. Similarly to Harford et al. (2008), we include the 1st and 4th quartiles of insider ownership, coded one respectively zero if insider ownership is within or out of the quartiles. The model is formulated accordingly.

$$Cash\ Holdings_{i,t} = \beta_0 + \beta_1 InsiderQ1_{i,\ t-1} + \beta_2 InsiderQ4_{i,\ t-1} + \beta_3 \sum(Control\ Variables) + year,\ indu\ \&$$
$$country + \varepsilon_{i,\ t}$$

Model (2)

As previously mentioned, we re-estimate the Pooled OLS model using the Fixed Effects model to address potential endogeneity. These include the same variables as in Models (1) and (2) and are formulated accordingly. For brevity, only models using POLS will be explicitly included in the rest of the Chapter[7].

$$Cash\ Holdings_{i,t} = \beta_0 + \beta_1 Insider_{i,\ t-1} + \beta_2 \sum(Control\ Variables) + year,\ indu\ \&\ country.\ FE + \varepsilon_{i,\ t}$$

Model (3)

$$Cash\ Holdings_{i,t} = \beta_0 + \beta_1 InsiderQ1_{i,\ t-1} + \beta_2 InsiderQ4_{i,\ t-1} + \beta_3 \sum(Control\ Variables) + year,\ indu\ \&$$
$$country.\ FE + \varepsilon_{i,t}$$

Model (4)

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[7] See Appendix 11 for model (5)-(10) re-estimated with the Fixed Effects model.

The second Hypothesis of this paper aims to investigate if insider ownership affects how companies distribute excess cash. To accomplish this, an estimation of excess cash is necessary. Similar to Opler et al. (1999) and Harford et al. (2008), we define excess cash as the unexplained portion of cash holdings in the regressions in Hypothesis one. More precisely, all observations with positive residuals in Model (4) are saved. We save the residuals from the model (4), considering that coming regressions will use quartiles of insider ownership, similar to Harford et al. (2008). Moreover, excess cash is lagged by one year to investigate future capital allocation decisions.

To capture the joint effect of excess cash and insider ownership on capital allocation decisions, interaction terms are included with the first and fourth quartiles, respectively. This interaction term shows how insider ownership affects the spending of excess cash on capital allocation decisions, which is the aim of Hypotheses 2_{1-3} and 3_{1-3}. For example, a positive coefficient on the interaction term $InsiderQ4_{i,t-1}*ExcessCash_{i,t-1}$ indicates that high insider ownership increases the spending of excess cash on the dependent variable. Similarly to Harford et al. (2008), we drop cash flow volatility for the following models. The following models are therefore formulated accordingly:

$$\Delta ACQ\_TA_{i,\,t} = \beta_0 + \beta_1 ExcessCash_{i,\,t-1} + \beta_2 InsiderQ1_{i,\,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,\,t-1}*ExcessCash_{i,\,t-1} + \beta_5 InsiderQ4_{i,\,t-1}*ExcessCash_{i,\,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + \varepsilon_{i,\,t}$$
$$(Model\ 5)$$

$$\Delta CapEx\_TA_{i,\,t} = \beta_0 + \beta_1 ExcessCash_{i,\,t-1} + \beta_2 InsiderQ1_{i,\,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,\,t-1}*ExcessCash_{i,\,t-1} + \beta_5 InsiderQ4_{i,\,t-1}*ExcessCash_{i,\,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + \varepsilon_{i,\,t}$$
$$(Model\ 6)$$

$$\Delta Pay\_To\_Share\_TA_{i,\,t} = \beta_0 + \beta_1 ExcessCash_{i,\,t-1} + \beta_2 InsiderQ1_{i,\,-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{1i,t-1}*ExcessCash_{i,\,t-1} + \beta_5 InsiderQ4_{i,\,t-1}*ExcessCash_{i,\,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + \varepsilon_{i,\,t}$$
$$(Model\ 7)$$

4.1.3.3 Hypothesis 3

The third Hypothesis of this study investigates how insider ownership affects capital allocation decisions when investment opportunities are limited. To test this, we use the same models but only perform the regressions on observations from low-value firms. To determine a threshold for a low-valued company, we follow Opler et al. (1999) by acknowledging that companies with a MTB lower than the median in the sample are deemed firms with few investment opportunities. Firms with MTB higher than the median are dropped from the regression. The following models are formulated:

$$\Delta ACQ\_TA_{i,\,t} = \beta_0 + \beta_1 ExcessCash_{i,\,t-1} + \beta_2 InsiderQ1_{i,\,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,\,t-1} * ExcessCash_{i,\,t-1} + \beta_5 InsiderQ4_{i,\,t-1} * ExcessCash_{i,\,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + \varepsilon_{i,\,t}$$
$$(Model\ 8)$$

$$\Delta CapEx\_TA_{i,\,t} = \beta_0 + \beta_1 ExcessCash_{i,\,t-1} + \beta_2 InsiderQ1_{i,\,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,\,t-1} * ExcessCash_{i,\,t-1} + \beta_5 InsiderQ4_{i,\,t-1} * ExcessCash_{i,\,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + \varepsilon_{i,\,t}$$
$$(Model\ 9)$$

$$\Delta Pay\_To\_Share\_TA_{i,\,t} = \beta_0 + \beta_1 ExcessCash_{i,\,t-1} + \beta_2 InsiderQ1_{i,\,-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{1i,t-1} * ExcessCash_{i,\,t-1} + \beta_5 InsiderQ4_{i,\,t-1} * ExcessCash_{i,\,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + \varepsilon_{i,\,t}$$
$$(Model\ 10)$$

4.2 Statistical tests

4.2.1 Heteroscedasticity

Heteroscedasticity refers to a situation where the variance of a variable is not constant across the sample. It is an important assumption that heteroscedasticity holds, otherwise, we are exposed to risks related to biased standard errors, inefficient estimates, and invalid inference. To detect heteroscedasticity, we perform a White's test, which examines whether patterns in the independent variable correlate with the squared residuals. White's test is reported in Appendix 8. The results confirm that the data contains heteroscedasticity, and we reject the null Hypothesis of homoscedasticity. Given the panel data construction, where measured factors may be correlated over periods, clustered robust standard errors are employed in subsequent regressions. The approach to using the Fixed Effects model further addresses both

serial correlation and heteroskedasticity in the error term (Bailey, 2017). To further address problems related to heteroscedasticity, standard errors are clustered by firm following (Harford et al., 2008). Introducing clustering by firm helps to mitigate the innate correlation between firm-specific observations.

4.2.2 Endogeneity

Exogeneity is a fundamental important assumption in econometric analyses and refers to a situation where the independent variables and the error term are uncorrelated. This assumption needs to hold for the estimates to be unbiased and efficient. However, a common problem is that we often have endogeneity in regression models, which refers to a situation when there is a correlation between the error term and one or more explanatory variables (Wooldridge, 2016). There are several common sources where endogeneity arises, including omitted variables, simultaneity bias, and reverse causality. As discussed, we employ the Fixed Effects model to address endogeneity concerns since this estimation method removes time-invariant characteristics of our independent variables.

One could argue that cash holdings and governance are jointly determined, raising concerns about endogeneity (Harford et al., 2008). However, we refrain from using an instrument variable to handle endogeneity, as previously mentioned. Instead, along the same lines as researchers on optimal capital structure literature, we implement an alternative approach to investigate whether corporate governance measures are related to the change in corporate cash holdings. We implement lagged cash holdings, as well as lagged governance variables, in our regression models. By implementing lagged values, we provide evidence of the ability of firm-specific governance variables to predict future cash holdings (Harford et al., 2008).

4.3 Robustness

To ensure that the estimations are consistent and not sensitive to estimation choices, several robustness tests are carried out with alternative estimation methods in accordance with previous literature.

For the first Hypothesis, three robustness tests are employed. First, the quartiles of the insider ownership variable are adjusted for size. Harford et al. (2008) argue that smaller companies generally have larger insider ownership, and adjusting for size acts as a control to see if results are solely dependent on size differences. Although size is included as a control

variable in all regressions, we follow previous literature to ensure robustness. Secondly, some authors have chosen to log the dependent variable Cash Holdings since this variable tends to be skewed (see Harford et al., 2008; Opler et al., 1999), while others have chosen not to log cash holdings (see Ozkan and Ozkan, 2004; Dittmar et al. (2007). A regression with logged cash is performed as a robustness check to ensure that the estimation method does not influence the interpretation of the results. Lastly, Harford et al. (2008) introduce a lagged cash variable as an endogeneity control. They argue that lagged cash captures time-constant effects not captured by other control variables if such exists. Roberts and Whited (2013) argue that fixed-effects models are not appropriate when a lagged dependent variable is used as an explanatory variable since the deviations-from-means transformation made to remove the fixed effect will be correlated with the lagged variable used in the regression. Therefore, the robustness test using a lagged variable will use POLS rather than fixed-effect estimation.

For Hypotheses 2_{1-3} and 3_{1-3}, previous scholars have employed different measurements on how the dependent variable, i.e., the capital allocation decision, is measured. While this study mainly adopts the method of Harford et al. (2008), who used the annual change relative to total assets as the dependent variable, some scholars have opted to use alternative measures. For example, Opler et al. (1999) do not investigate the annual change but rather employ the total expenses on acquisitions, capital expenditures and shareholder distributions, scaled by total assets. Similar methods are employed by Grinstein and Michaely (2005) and Suh and Chey (2009). To ensure robustness, we re-estimate regressions using total capital allocation expenditures relative to total assets as our dependent variable.

5. Empirical Results

In this Chapter, we present the results for the regressions. First, we present the regression results relating to Hypothesis 1, including the Pooled OLS and Fixed Effect model results. Then we present the results relating to Hypotheses 2 and 3.

5.1 Regression Results Hypothesis 1

Table 2 reports the outcomes of Hypothesis 1, examining the relationship between insider ownership and corporate cash holdings. The Fixed Effects model and POLS are employed, clustered by firm, and controlled with industry, country, and year dummies.

Models (1) through (4) exhibit a significant negative relationship between insider ownership and cash holdings. Models (1) and (3) both exhibit statistical significance at the 1% and 10% level respectively for the variable *LagInsider*. Economically interpreting the magnitudes, each percentage unit insiders increase their ownership in the firm, the firm holds 0.068% and 0.045% less cash holdings, respectively. For models (2) and (4), showcasing the 1st (lowest) and 4th (highest) quartiles of insider ownership, *Q4Insider* exhibits the statistical significance of 1% and 5% in models (2) and (4), respectively. Interpreting the coefficient, firms in the Nordic market with high insider ownership, on average, have 2.5 and 1.6 percent units (depending on which model we use) lower cash holdings than firms not in the top quartile. Based on the results in Table 2, we observe a statistically significant negative relationship between insider ownership and corporate cash holdings. Consequently, the results show that higher insider ownership decreases firms' cash holdings, and the null Hypothesis is rejected. However, the Hypothesis formulated in section 2.3.1 predicted that higher insider ownership would lead to higher cash holdings. Therefore, we fail to find support for the alternative Hypothesis.

Most of the control variables are significant with their predicted sign. Notably, Cash flow changes direction when we re-estimate the model using Fixed Effects. This could be a result of heterogenetic or endogeneity bias, but considering that no statistical significance is lost in the FE model, we can conclude that the results are robust. Of the governance variables, only strategic ownership reports statistical significance and has a negative coefficient, indicating that a higher degree of strategic blockholders leads to less cash holdings.

Table 2: Regression results for Hypothesis 1

Model	(1)	(2)	(3)	(4)
Dependent Variable	Cash Holdings	Cash Holdings	Cash Holdings	Cash Holdings
Insider Ownership (lagged)	-0.068***		-0.045*	
	(0.022)		(0.025)	
Q1 Insider		0.003		-0.007
		(0.007)		(0.006)
Q4 Insider		-0.025***		-0.016**
		(0.008)		(0.007)
Size	-0.016***	-0.016***	-0.017***	-0.017***
	(0.002)	(0.002)	(0.006)	(0.006)
Net Working Capital	-0.165***	-0.167***	-0.240***	-0.241***
	(0.026)	(0.026)	(0.030)	(0.030)
Cash Flow	-0.153***	-0.153***	0.142***	0.142***
	(0.034)	(0.034)	(0.025)	(0.025)
Cash Flow Volatility	-0.531***	-0.521***	-0.625*	-0.190
	(1.249)	(1.296)	(0.346)	(0.440)
Leverage	-0.245***	-0.245***	-0.142***	-0.142***
	(0.020)	(0.020)	(0.021)	(0.021)
R&D Intensity	0.128***	0.127***	0.0410	0.042
	(0.042)	(0.042)	(0.070)	(0.070)
Market-To-Book	0.022***	0.023***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Dividend Indicator	-0.005	-0.0060	0.008*	0.008*
	(0.006)	(0.006)	(0.004)	(0.004)
Acquisitions Intensity	0.000	0.000	-0.003	-0.004
	(0.028)	(0.028)	(0.023)	(0.023)
Capex Intensity	-0.154**	-0.153**	-0.252***	-0.253***
	(0.075)	(0.075)	(0.054)	(0.054)
Board Size (lagged)	0.008	0.008	0.023	0.023
	(0.016)	(0.016)	(0.017)	(0.017)
Institutional Ownership (lagged)	-0.024	-0.020	-0.015	-0.012
	(0.017)	(0.016)	(0.014)	(0.015)
Strategic Ownership (lagged)	-0.041**	-0.038**	-0.0150	-0.014
	(0.017)	(0.016)	(0.016)	(0.015)
Constant	1.280***	1.240***	0.376***	0.316***
	(0.127)	(0.132)	(0.060)	(0.071)
Observations	6606	6606	6606	6606
Number of Firms	772	772	772	772
Country,, Industry & Year Controls	Yes	Yes	Yes	Yes

R-squared	0.52	0.521	0.148	0.149
Standard Errors (by firm)	Clustered	Clustered	Clustered	Clustered
Method	POLS	POLS	FE	FE

5.2 Regression Results Hypothesis 2

The findings relating to Hypothesis *2.1, 2.2 and 2.3* are detailed in Table 3. Due to minor differences between the POLS and Fixed Effects models, the latter will primarily be discussed, as the Fixed Effect model attends to endogeneity concerns, as discussed in Chapter 4.

Model (5b) employs ΔACQ_TA as the dependent variable. The variables of interest in Hypothesis *2.1* are *Q1*CASH* and *Q4*CASH*, respectively, displaying the joint effect of insider ownership and excess cash on capital allocation decisions. *Q4*CASH* exhibits no statistical significance, while *Q1*CASH* shows statistical significance at the 5% level, with a negative coefficient of -0.093. The economic interpretation is that an increase of one percentage unit in excess cash leads to 0.093 percentage units less increase in excess cash spent on acquisitions for firms in the lowest quartile compared to those in other quartiles. Furthermore, *Excess Cash (lagged)* shows a positive coefficient, albeit with weak statistical significance (10%), indicating that firms pursue more acquisitions when excess cash is available. Contrary to the predictions in Hypothesis *2.1*, our results indicate that firms in the lowest quartile of insider ownership are less likely to spend excess cash on acquisitions. Consequently, the null Hypothesis is rejected, but we fail to find support for H_1, given that the direction deviates from our predictions.

The results for Hypothesis *2.2* are shown in model (6b), where we employ $\Delta CAPEX\_TA$ as the dependent variable, and *Q1*CASH* and *Q4*CASH* as the main explanatory variables.

Q1*CASH variable is not statistically significant. *Q4*CASH* is significant at the 10% level, with a positive coefficient. The economic interpretation is that, for each percentage unit excess cash increases, being within the highest quartile of insider ownership increases the excess cash spent on capital expenditures by 0.03 percentage units more than other quartiles. However, interpretations should be done cautiously due to the weak significance level. Hypothesis *2.2* predicted that higher insider ownership would lead to lower spending on capital expenditures. Instead, at weak significance, we find the opposite relationship to be true. Again, the null Hypothesis is rejected, but we fail to find support for the alternative Hypothesis.

Lastly, model (7b) employs Δ*Pay_To_Share* as the dependent variable. *Q1*CASH* is statistically significant at a 5% level, exhibiting a positive coefficient of 0.03. The economic interpretation is that, for each percentage excess cash increases, being within the lowest quartile of insider ownership increases excess cash spent on shareholder distributions by 0.03 percentage units more than in other quartiles. *Excess Cash (lagged)* exhibits a strong and positive significant coefficient, indicating that Nordic firms increase their shareholder distribution when they access excess cash. Hypothesis *2.3* predicted that higher insider ownership would lead to lower dividend payments. We find this to be true and therefore reject the null Hypothesis in favor of the alternative Hypothesis.

Table 3: Regression results for Hypothesis 2

Model	(5a)	(6a)	(7a)	(5b)	(6b)	(7b)
Dependent Variable	ΔACQ_TA	ΔCAPEX_TA	ΔPay_To_Share	ΔACQ_TA	ΔCAPEX_TA	ΔPay_To_Share
Excess Cash (lagged)	0.02	0.009*	0.016***	0.053*	0.018*	0.024**
	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Q1 Insider	0.004	-0.002	0.001	0.014	-0.004	-0.001
	(0.005)	(0.002)	(0.002)	(0.010)	(0.004)	(0.003)
Q4 Insider	-0.004	-0.001	0.003	-0.01	-0.004	0.003
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
Q1*CASH	-0.053*	0.017	0.001	-0.093**	0.024	0.030**
	(0.03)	(0.01)	(0.01)	(0.05)	(0.02)	(0.02)
Q4*CASH	0.019	0.014	-0.007	0.052	0.030*	-0.016
	(0.03)	(0.01)	(0.01)	(0.06)	(0.02)	(0.02)
Size	-0.001	0.001	-0.001*	-0.004	-0.003**	-0.007***
	(0.00)	(0.001)	0.00	(0.01)	(0.00)	(0.00)
Net Working Capital	-0.01	0.001	-0.003	-0.002	-0.012	0.002

	(0.011)	(0.004)	(0.004)	(0.030)	(0.010)	(0.008)
Cash Flow	0.019***	0.005**	0.011***	0.034**	0.007**	0.019***
	(0.006)	(0.002)	(0.003)	(0.014)	(0.003)	(0.004)
Market-To-Book	-0.001	0.001	0.001	-0.002	0.001	0.001
	(0.001)	(0.000)	(0.000)	(0.002)	0.000	(0.001)
Board Size (lagged)	0.010**	-0.001	-0.001	-0.013	-0.002	-0.007*
	(0.004)	(0.001)	(0.001)	(0.024)	(0.004)	(0.004)
Institutional ownership (lagged)	0.007	-0.008**	0.000	-0.009	-0.01	-0.001
	(0.009)	(0.003)	(0.004)	(0.021)	(0.007)	(0.007)
Strategic Ownership (lagged)	-0.001	-0.005	0.001	-0.023	0.004	0.004
	(0.008)	(0.003)	(0.003)	(0.022)	(0.008)	(0.008)
Constant	0.001	0.001	-0.030***	0.057	0.023*	0.056***
	(0.01)	(0.01)	(0.01)	(0.06)	(0.01)	(0.02)
Observations	2215	2215	2215	2215	2215	2215
Number of Firms	469	469	469	469	469	469
Country, Industry & Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.02	0.032	0.064	0.017	0.023	0.063
Standard Errors (by firm)	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Method	POLS	POLS	POLS	FE	FE	FE

*Notes: This table shows the effects of insider ownership on capital allocation decisions. The dependent variables are ΔACQ_TA, ΔCAPEX_TA and ΔPay_To_Share. **Excess Cash** is the positive residuals from the cash holdings estimation in Model (4) in Hypothesis 1. **Q1** and **Q4** are dummy variables that indicate whether a firm is within the highest or lowest quartile of insider ownership. **Q1*CASH** and **Q4*CASH** are interaction terms representing the product of the insider quartile multiplicated with the excess cash variable. These interaction terms measure the joint effect of insider ownership and spending of excess cash. **Size** is proxied by each firm's natural logarithm of total assets. **Net Working Capital** is the Net Working Capital excluding cash over Total Assets. **Cash Flow** represents cash from operations divided by Total Assets. **Market to Book** is calculated by the book value of assets and market value of equity, subtracted from the book value of equity, divided by total assets. **Board Size** is the number of board members divided by the log of Total Assets. **Institutional** and **Strategic Ownership** represents the total number of shares held by institutions or strategic owners divided by the total number of outstanding shares. All regressions include dummy variables controlling for **Year, Industry,** and **Country** effects.*
*** p<0.01, ** p<0.05, * p<0.1

5.3 Regression Results Hypothesis 3

For Hypotheses *3.1, 3.2,* and *3.3*, we re-estimate the models from Hypothesis 2, including only firms with lower MTB than the sample median. The results are reported in Table 4. Once again, the results using POLS or fixed effects demonstrate comparable findings. Hence, the discussion will revolve around the results of the Fixed Effects model.

Models (8b) and (9b) show the regression results for annual change in acquisition and capital expenditure activity in firms with excess cash and limited investment opportunities. Both models show statistical insignificance for the main explanatory variables. Therefore, we can not conclude any systematic effect of insider ownership on the spending of excess cash on

capital expenditures and acquisitions in firms with low market valuations. Consequently, we find support for the null Hypothesis for Hypothesis *3.1* and *3.2*, which states that insider ownership does not affect the spending of excess cash on acquisitions and capital expenditures when the firm has limited investment opportunities.

Model (10b) exhibits statistical significance for both interaction terms. *Q1*CASH* shows a positive coefficient of 0.085, although at weak significance. This indicates that being within the lowest quartile of insider ownership, a one percentage unit increase of excess cash increases excess cash spent on shareholder distributions by 0.085 percentage units more than other quartiles. Interestingly, the variable *Q4*CASH* is also positive and statistically significant with a coefficient of 0.104. This indicates that being within the highest quartile of insider ownership, a one percentage unit increase in excess cash increases excess cash spent on shareholder distributions by 0.104 percentage units. Hypothesis *3.3* predicted that higher insider ownership would lead to higher shareholder distributions of excess cash when investment opportunities are limited. Despite the significance of the *Q4*CASH* variable, we fail to find support for the alternative hypothesis. Since the *Q1*CASH* also reports statistically significant results, the results indicate that lower insider ownership also increases shareholder distribution when investment opportunities are limited. Therefore, we cannot uncover a linear relationship between insider ownership and shareholder payments. Consequently, we reject the null hypothesis but fail to find support for the alternative hypothesis.

Table 4: Regression results for Hypothesis 3

Model	(8a)	(9a)	(10a)	(8b)	(9b)	(10b)
Dependent Variable	ΔACQ_TA	ΔCAPEX_TA	ΔPay_To_Share	ΔACQ_TA	ΔCAPEX_TA	ΔPay_To_Share
Excess Cash (lagged)	0.012	0.022	0.013	-0.031	0.04	-0.008
	(0.037)	(0.018)	(0.012)	(0.051)	(0.036)	(0.023)
Q1 Insider	0.006	-0.001	0	0.006	-0.003	-0.002
	(0.007)	(0.003)	(0.002)	(0.010)	(0.006)	(0.003)
Q4 Insider	0.006	0.002	-0.002	0.014	0.005	-0.006
	(0.008)	(0.003)	(0.003)	(0.013)	(0.009)	(0.006)
Q1*CASH	-0.031	0.014	-0.002	0.09	0.03	0.085*
	(0.052)	(0.027)	(0.024)	(0.067)	(0.067)	(0.049)
Q4*CASH	-0.002	-0.02	0.095***	-0.045	-0.024	0.104***
	(0.044)	(0.023)	(0.029)	(0.058)	(0.036)	(0.040)
Size	0.001	0	0	-0.004	-0.005**	-0.006**
	(0.001)	(0.001)	0.000	(0.005)	(0.002)	(0.003)

Net Working Capital	-0.028**	-0.007	0.004	-0.008	-0.021	0.007
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Cash Flow	0.039**	0.015**	0.020***	0.052	0.026**	0.030*
	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.02)
Market-To-Book	-0.013	0.005	0.006	-0.009	0.020***	0.014**
	(0.008)	(0.004)	(0.004)	(0.013)	(0.006)	(0.007)
Board Size (lagged)	0.024**	-0.004	-0.002	0.060*	0.001	0.002
	(0.010)	(0.003)	(0.003)	(0.034)	(0.010)	(0.009)
Institutional ownership (lagged)	0.003	-0.007	0.011**	-0.01	-0.008	0.015
	(0.013)	(0.006)	(0.006)	(0.025)	(0.014)	(0.011)
Strategic Ownership (lagged)	0.013	-0.007	0.006	0.006	0.003	0.021
	(0.010)	(0.005)	(0.005)	(0.022)	(0.012)	(0.013)
Constant	-0.03	-0.046***	-0.008	-0.011	0.019	0.028
	(0.021)	(0.010)	(0.009)	(0.068)	(0.024)	(0.034)
Observations	1108	1108	1108	1108	1108	1108
Number of firms	321	321	321	321	321	321
Country, Industry & Year control	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.075	0.065	0.115	0.034	0.047	0.109
Standard Errors (by firm)	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Method	POLS	POLS	POLS	FE	FE	FE

*Notes: This table shows the effects of insider ownership on capital allocation decisions. The dependent variables are ΔACQ_TA, ΔCAPEX_TA and ΔPay_To_Share.. **Excess Cash** is the positive residuals from the cash holdings estimation in Model (4) in Hypothesis 1. **Q1** and **Q4** are dummy variables that indicate whether a firm is within the highest or lowest quartile of insider ownership. **Q1*CASH** and **Q4*CASH** are interaction terms representing the product of the insider quartile multiplicated with the excess cash variable. These interaction terms measure the joint effect of insider ownership and spending of excess cash. **Size** is proxied by each firm's natural logarithm of total assets. **Net Working Capital** is the Net Working Capital excluding cash over Total Assets. **Cash Flow** represents cash from operations divided by Total Assets. **Market to Book** is calculated by the book value of assets and market value of equity, subtracted from the book value of equity, divided by total assets. **Board Size** is the number of board members divided by the log of Total Assets. **Institutional** and **Strategic Ownership** represents the total number of shares held by institutions or strategic owners divided by the total number of outstanding shares. All regressions include dummy variables controlling for **Year**, **Industry**, and **Country** effects.*
*** p<0.01, ** p<0.05, * p<0.1

5.4 Robustness Results

A series of robustness tests for Hypothesis 1 are attached in Appendix 9. For the first hypothesis, we check if the results are robust by employing (1) insider ownership in quartiles adjusted for size, (2) logged cash variable as our dependent variable, and (3) introducing lagCash to capture a firm's cash holdings the previous year[8]. Although the levels of statistical significance drop to weak significance in all robustness tests, all models are still significant

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[8] (1) insider ownership in quartiles adjusted for size corresponds to model (1R), (2) logged cash variable as our dependent variable corresponds with model (2R) and (3) introducing lagCash corresponds with model (3R) in Appendix 9.

with their alternative variable definition. This means that the results discussed in section 5.1 are not subject to the choice of variable definition, and we can ensure the robustness of these results.

For the second and third hypotheses, we re-estimate regression relating to these hypotheses, see Appendix 10. Similar to Opler et al. (1999), we re-estimate the model using the total expenses on acquisitions, capital expenditures, and dividend payments divided by total assets instead of the annual change. Model (4R) through (6R) in the Table corresponds to Hypothesis *2*, while model (7R) through (9R) corresponds to Hypothesis *3*. Overall, the robustness tests align with the results reported in sections 5.2 and 5.3. However, we lose significance for the interaction term *Q4*CASH* in the model (5R). Considering the weak statistical significance from the model (5b), the loss of significance shows the importance of interpreting weakly significant variables with caution since small adjustments in the model could alter the results. Furthermore, model (8R) exhibits significance when using robust tests and is not significant in the original model (see Table 4; Model 9b). Following the discussion of potential co-determination in section 3.2.1, we believe that our original tests deal with potential co-determination sufficiently. However, the model (8R) results show that hypothesis *2.2* might be subject to the choice of estimation methods. Other than these small deviations from our original tests, the robustness tests show similar patterns, and we conclude that our results are generally robust to alternative estimation methods.

6. Analysis of Results

The Following Chapter analyzes the results through the scope of theoretical foundations, the Nordic Governance Model, and previous empirical evidence.

6.1 How does Insider Ownership affect Cash Holdings?

In light of previous research, our findings provide a nuanced perspective on the relationship between cash holdings and insider ownership. Despite a robust Corporate Governance model, our results contradict our initial assumptions. Previous research on cash holdings and insider ownership argues that shareholder protection in different geographical regions significantly influences this relationship. Harford et al. (2008) conclude that their results show that in markets characterized by strong corporate governance, managers with high insider ownership will be rewarded by receiving shareholders' trust, ultimately enabling them to hold more cash. Consequently, shareholders will not enforce fiscal discipline to restrict management's access to cash. Moreover, Faleye (2004) and Pinkowitz (2002) argue that markets with strong corporate governance will see self-interested managers with low insider ownership reduce the level of excess cash, making themselves less attractive to takeover threats.

Our results show a potential non-linear relationship between insider ownership and cash holdings. Considering that only *Q4Insider* exhibits statistical significance, we unravel that the true relationship between insider ownership and cash holdings is asymmetric. That is, insider ownership, after a certain threshold (18.45 % insider ownership), corresponds with less cash holdings, while low insider ownership does not seem to affect cash holdings. The interferences from the linear coefficient could suggest that the results are inaccurate, potentially understating the effect of high insider ownership or overstating the effects of low insider ownership. Regardless, these results suggest that the alignment effect dominates the entrenchment effect at high levels of insider ownership. That is, management demonstrates alignment with shareholders by holding lower cash and retaining their trust, limiting their own ability to engage in empire-building. This observation indicates that the theory of agency cost of free cash flow presented by Jensen (1986) dominates the effect of insider ownership on cash holdings rather than the flexibility hypothesis suggested by Harford et al. (2008).

There are several explanations for why our results differ from our initial assumptions and what has been observed in the American market. One plausible explanation could be that the presence of large blockholders in the Nordic market forces firms with high insider ownership to hold lower cash levels to signal that accumulated funds will not be used for the exploitation of minority shareholders. As pointed out by Lekvall (2014), the minority protection regulation is generally strong in the Nordics but has also been subject to criticism. Ferinha and Foronda (2009) argue that the presence of large blockholders in the European markets explains how insider ownership affects capital decisions. They argue that, given the large blockholders' ability to exploit minority shareholders, firms with high insider ownership signal alignment with shareholders by holding less cash. Therefore, our counterintuitive findings could result from large controlling insiders' need to signal their alignment with their shareholders. By holding less cash reserves, firms with high insider ownership can signal that they are not accumulating funds for private benefits, thus reassuring minority shareholders that they will not exploit them.

Moreover, the fact that our results are more in line with the studies performed on European markets (see Ozkan and Ozkan, 2004; Dittmar et al., 2006) suggests that there might be other factors than regional shareholder rights that explain the contradicting findings. Previous literature provides little insight into cultural aspects and their influence on the relationship. While geographical shareholder protection rights may dominate as a key assumption in understanding the relationship between cash management and insider ownership, our results may indicate that other contextual factors, such as values and cultural norms, may be equally important. For instance, in countries and cultures where the trust in the management is inherently low, shareholders may exert more control over corporate assets to mitigate agency conflicts, regardless of the governance structure. Conversely, insider ownership may not be perceived as important in cultures with a strong tradition towards managerial discretion and autonomy as in other countries/cultures.

6.2 Does Insider Ownership Influence Capital allocation decisions?

We find that low insider ownership leads to lower spending of excess cash on acquisitions, while low insider ownership increases the distribution of excess cash to shareholders. Furthermore, high insider ownership increases excess cash spent on capital expenditures, although it exhibits weak statistical significance. While the results from the regressions for acquisitions and capital expenditures deviate from our predictions, the overall results from our second Hypothesis could be explained by what previous scholars have found regarding the alignment effect on strong corporate governance markets.

Our results indicate that if management is perceived not to be aligned with their shareholders, shareholders will exercise their power to limit managerial spending on acquisitions and force them to pay out residual cash to shareholders. These arguments closely align with those presented by Jensen (1986) concerning fiscal discipline and the necessity of limiting management's ability to engage in empire-building. The same reasoning applies to capital expenditures, where our results indicate that if the shareholders believe that management's motives are aligned with their own, managers are rewarded with trust to invest in value-adding investments rather than distributing excess cash back to the shareholders. Previous literature generally supports the notion that shareholders would reward management with the trust of stewardship of accumulated funds in firms with higher insider ownership. Ferrerira and Foronda (2009) and Harford et al. (2008) argue that markets with strong shareholder rights will allow management to accumulate more cash, hence reducing the need for fiscal discipline. Harford et al. (2008) find that higher insider ownership leads to increased dividends but extend the analysis and argue that their findings contradict the strong shareholder hypothesis. Following this, our results suggest that high insiders, perceived to be aligned with shareholders, should be rewarded with the flexibility to accumulate funds rather than distribute them to shareholders. On the other hand, low insider ownership increases the need for fiscal discipline since information asymmetry between agents and principles makes it difficult for shareholders to trust managers holding large amounts of cash. Given the transaction costs of raising cash, this might amplify the underinvestment problem (Keynes, 1936).

Furthermore, distributing excess cash may be a sign of alignment from management, even though other investments could be more value-adding. This could be explained by traditional

agency arguments resulting from asymmetric information. That is, the inherent asymmetry of information regarding potential value-adding investments may force management to distribute the excess cash to shareholders to retain their trust and demonstrate alignment. Again, this might cause management to underinvest in profitable projects due to the transaction costs of raising new capital.

Another possible explanation for why low insider firms increase dividend payments could be that firms with low insider ownership seek to reduce their cash position, making the firm less attractive for hostile takeovers. These arguments are presented by Faleye (2004) and Pinkowitz (2002), who both state that paying out large dividends is one way of minimizing takeover threats. Given the supposedly strong market discipline on the Nordic stock exchanges documented by Lekvall (2014) and Skog (2004), this could explain why firms with low insider ownership choose to distribute more excess cash through dividends.

6.3 Does Insider Ownership Affect Capital Allocation in Low-MTB?

For Capital Expenditures and Acquisitions, we fail to reach any significance in our regression. Hence, we find support for the null hypothesis that higher insider ownership does not increase spending of excess cash on capital expenditures and acquisitions. This means that we do not find support for Opler et al. (1999) notion that insider ownership would mitigate excess spending on acquisitions and capital expenditures when investment opportunities are limited.

However, it is worth noting that the excess cash variable is not statistically significant in any regression that uses acquisitions or capital expenditures as dependent variables in Table 4. This means we can not conclude that excess cash would significantly affect acquisitions or capital expenditures (regardless of high or low insider ownership) when investment opportunities are limited. These findings contradict Opler et al. (1999), who found that higher excess cash leads to more acquisitions and capital expenditures despite poor investment opportunities. When comparing our results in Hypothesis 3_{1-2} to those in Hypothesis 2_{1-2}, it is interesting that the statistical significance for both interaction terms with acquisitions and capital intensity as a dependent variable disappears. This suggests, contrary to what was shown in Hypothesis 2_{1-2}, that higher insider ownership does not increase investments in acquisitions and capital expenditures when firms with high MTB firms are removed. This

could indicate that the increased spending on acquisitions and capital expenditure in Hypothesis 2_{1-2} is not a sign of empire-building. Instead, it could be a sign that the increased acquisition and capital expenditure activity disappears once investment opportunities are limited.

However, for payments to shareholders, we find that both of the interaction variables *Q1*CASH* and *Q4*CASH* are statistically significant. This indicates that the effect of insider ownership on payments to shareholders is not linear since being in either the top or bottom quartile of insider ownership increases dividend payments when investment opportunities are limited. We interpret that shareholder distribution could substitute for active corporate governance if shareholders suspect managers are not aligned with shareholders. In contrast, aligned managers will increase dividends if no other profitable investment opportunities exist to maximize shareholder value. These findings are consistent with Officer (2006) and Ferreira and Foronda (2009), both of which show that the effect of insider ownership on dividend payments is non-linear. This non-linear relationship implies complexities in how insider ownership affects shareholder distributions. Moreover, La Porta (2000) suggests that these findings are consistent with Jensen's theory (1986), i.e., fiscal discipline can replace the need for active monitoring, which applies to our results. We unravel a nuanced interaction between the alignment effect in the presence of limited investment opportunities.

7. Conclusion

This Chapter concludes the paper and reviews the main contributions. We also suggest further research.

7.1 Summary and Conclusion

This study investigated Nordic firms and focused on the relationship between insider ownership and cash holdings and its effect on capital allocation decisions when excess cash is available. By employing a POLS and a Fixed-Effect model to address endogeneity concerns, this study shows that insider ownership significantly affects cash holdings and capital allocation decisions of excess cash.

Firstly, contrary to our expectations, we unravel a negative, potentially non-linear relationship between insider ownership and cash holdings. Despite a strong Corporate Governance model, Nordic firms with high insider holdings do not accumulate cash to maximize operational flexibility. These results shed new light on previous studies, which have mainly argued that in countries with strong shareholder rights, higher insider ownership will be rewarded with higher trust from shareholders to act as stewards for corporate assets. Our findings underscore the importance of evaluating alternative explanations to understand the relationship between insider ownership, cash holdings, and capital allocation.

Secondly, our results show that insider ownership significantly affects the allocation of excess cash. Firms with low insider ownership spend less of their excess cash on acquisitions and instead increase shareholder payments. Contrary, firms with high insider ownership increase spending of excess cash on capital expenditures. These results support the notion that higher insider ownership fosters shareholder trust in markets with strong regulation and enhances managerial flexibility, allowing them to invest in value-adding projects. Contrary, in firms with low insider ownership, dividends are used as a fiscal disciplining tool to limit managerial discretion. These results indicate that higher insider ownership allows for more efficient governance by evading transaction costs of fiscal discipline.

Lastly, we build upon previous researchers and investigate how insider ownership affects capital allocation of excess cash when investment opportunities are limited. For acquisitions and capital expenditures, we can not conclude that insider ownership would significantly

affect the spending of excess funds. However, for dividends, we find that both firms with low and high insider ownership increase their shareholder distributions, unraveling a non-linear relationship. The interpretation is that shareholder distribution could work as a disciplinary action to substitute for poor corporate governance but also as a sign of alignment between shareholders and management.

7.2 Limitations and Recommended Further Research

Despite several efforts to mitigate issues that we have encountered during the writing of this paper, we recognize some limitations. Although we study the years 2009-2023, a longer sample period would be preferred. While our sample size is relatively large for our first hypothesis, it is significantly reduced for Hypothesis *2* and then again for Hypothesis 3. This left us with only 1108 for our third hypothesis. Although the number of observations was deemed large enough to make reliable interpretations of the results, one could argue that the loss of significance in Hypotheses *3.1* and *3.2* potentially results from the reduced number of observations in these regressions rather than the exclusion of high MTB firms. Moreover, we use a fairly general definition of strategic ownership. While we control for large strategic blockholders, this study overlooks the differences between different strategic owners. One could argue that these have distinct characteristics, which should have implications for the outcome of the results. For example, given the large presence of sphere ownership in the Nordic market and their operational influence, one could extend the analysis, focusing more on Sphere Ownership and its characteristics.

Moreover, while this study has been limited to investigating one aspect of ownership concentration on the Nordic stock exchanges, potential research topics outside the immediate scope of this study have emerged during the process. Our study overlooks social or cultural aspects, which leaves us to encourage further research to extend these parameters. For example, by including the ratio of domestic vs foreign managers/board members, one could capture the dynamics of risk appetite and other cultural aspects not captured by our model. In studies on earnings management, for example (see Hooghiemstra et al., 2019; Du, Jian, and Lai, 2017), it is perceived that foreign managers/board members are more risk-seeking, which potentially could affect a firm's cash management and capital allocation decisions.

Attachments

Appendix 1: Descriptive Statistics by Industry

Industry name (ICB)	Number of observations	Proportion
Telecommunications	401	5,44%
Consumer Discretionary	858	11,63%
Consumer Staples	440	5,96%
Energy	545	7,39%
Health Care	1101	14,92%
Industrials	2380	32,26%
Technology	1191	16,14%
Basic Materials	462	6,26%
Total	**7378**	**100,00%**

Note: Appendix 1 displays industry statistics by industry. While some industries dominate the sample, no industry reports too few observations to be excluded from the analysis.

Appendix 2: Descriptive Statistics by Year

Year	Number of observations	Proportion
2009	N/A	
2010	354	4,80%
2011	416	5,64%
2012	425	5,76%
2013	390	5,29%
2014	459	6,22%
2015	487	6,60%
2016	513	6,95%
2017	548	7,43%
2018	576	7,81%
2019	580	7,86%
2020	620	8,40%
2021	681	9,23%
2022	678	9,19%
2023	651	8,82%
Total	**7378**	**100,00%**

Note: Appendix 2 provides descriptive statistics by year. 2009 is N/A since we only include this year to access lagged values for coming years.

Appendix 3: Descriptive Statistics by Country

Country	Number of observations	Proportion
Sweden	3244	43,97%
Denmark	914	12,39%
Norway	1848	25,05%
Finland	1372	18,60%
Total	**7378**	**100,00%**

Note: Appendix 3 shows the distribution of firms by country. Notably, Swedish firms dominate the sample. However, by including country dummies in all regressions, we can ensure that our results are not distorted depending on what country the firm is registered in.

Appendix 4: Insider Ownership Segmented into Quartiles

Quartiles	Mean	Median	Min	Max	N
1st Quartile	0.21	0.15	0.007	0.672	1844
2nd Quartile	2.48	2.33	0.673	5.31	1845
3rd Quartile	10.77	10.29	5.33	18.43	1845
4th Quartile	37.89	34.38	18.45	69.1	1844
Total	**12.84**	**5.33**	**0.07**	**69.1**	**7378**

*Note: Appendix 4 displays summary statistics of **Insider Ownership** segmented into quartiles.*

Appendix 5: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Cash Holdings	1.000														
(2) InsiderOwnerhsip	0.019	1.000													
(3) Size	-0.402***	-0.368***	1.000												
(4) Net Working Cap	-0.216***	0.102***	0.011	1.000											
(5) Cash Flow	-0.390***	-0.002	0.387***	0.121***	1.000										
(6) Cash Flow Vol	0.424***	-0.005	-0.294***	-0.091***	-0.355***	1.000									
(7) Leverage	-0.386***	-0.081***	0.234***	-0.002	0.038***	-0.251***	1.000								
(8) Market-to-Book	0.458***	0.043***	-0.255***	-0.063***	-0.127***	0.375***	-0.250***	1.000							
(9) RD Intensity	0.356***	-0.054***	-0.180***	-0.134***	-0.347***	0.342***	-0.128***	0.272***	1.000						
(10) Dividend indicator	-0.276***	-0.035***	0.426***	0.171***	0.418***	-0.271***	-0.031***	-0.075***	-0.200***	1.000					
(11) Acquisition Intents	0.018	-0.022*	0.016	-0.002	-0.008	0.046***	0.011	0.044***	0.098***	-0.006	1.000				
(12) Capex Intensity	-0.114***	-0.057***	0.152***	-0.043***	0.104***	-0.149***	0.144***	-0.096***	-0.083***	0.041***	-0.027**	1.000			
(13) Board Size	0.285***	0.089***	-0.328***	-0.079***	-0.301***	0.251***	-0.229***	0.231***	0.237***	-0.160***	-0.006	-0.107***	1.000		
(14) Institutional Own	-0.095***	-0.304***	0.365***	0.044***	0.179***	-0.030**	0.004	0.031***	-0.045***	0.210***	0.042***	-0.044***	-0.117***	1.000	
(15) Strat Ownership	-0.007	0.423***	-0.185***	0.017	-0.022*	-0.121***	0.092***	-0.060***	-0.057***	-0.067***	-0.031***	0.058***	-0.033***	-0.456***	1.000

Notes: Table 5 reports a correlation matrix. See table 1 for variable definition.
*** p<0.01, ** p<0.05, * p<0.1

Appendix 6: Insider Ownership Based on Firm Size

SIZE Quartiles	Mean	p25	Median	p75	N
1st Quartile	19.93	5.01	14.1	30.70	1844
2nd Quartile	16.10	3.03	9.85	23.54	1845
3rd Quartile	10.08	.813	3.46	11.68	1845
4th Quartile	3.93	.075	0.29	2.16	1844
Total	**12.59**	**0.67**	**5.04**	**17.84**	**7378**

Note: Appendix 6 provides Insider Ownership segmented into quartiles and adjusted for size. The first column displays that observations are divided into sizes based on their reported Total Assets.

Appendix 7: Hausman Test

X^2 (46)	Prob > X^2	Best fit
401,91	0,000	Fixed Effects

Note: Test to determine whether Firm Fixed Effect or Random Effects is most appropriate. Since the null hypothesis is rejected, Fixed-Effects is preferred for our regressions.

Appendix 8: Test for Heteroskedasticity

White test	H_0	X^2 Statistics	df	P-value
	Homoscedasticity	3379,31	63	0,000

Note: White's test for Heteroskedasticity in the sample

Appendix 9: Robustness Test Hypothesis 1

Model	(1R)	(2R)	(3R)
Dependent Variable	Cash Holdings	Log(Cash Holdings)	Cash Holdings
Q1 (Size-Adjusted)	-0.003		
	(0.005)		
Q4 (Size-Adjusted)	-0.011*		
	(0.007)		
Q1 Insider		-0.06	0.000
		(0.051)	(0.003)
Q4 Insider		-0.086*	-0.010***
		(0.051)	(0.004)
Cash Holdings (lagged)			0.698***
			(0.022)
Size	-0.016**	-0.085**	-0.006***
	(0.007)	(0.042)	(0.001)
Net Working Capital	-0.252***	-1.494***	-0.091***
	(0.029)	(0.202)	(0.013)
Cash Flow	0.069***	1.090***	0.064***
	(0.019)	(0.143)	(0.017)
Cash Flow Volatility	-0.526	-6.185*	-0.285
	(0.382)	(3.208)	(0.516)
Leverage	-0.144***	-1.074***	-0.074***
	(0.021)	(0.177)	(0.011)
R&D / sales	0.038	0.267	0.069***
	(0.069)	(0.33)	(0.019)
Market-To-Book	0.006***	0.039***	0.005***
	(0.002)	(0.012)	(0.001)
Dividend	0.009**	0.057	-0.008***
	(0.004)	(0.041)	(0.003)
Acquisitions Activity	-0.007	-0.001	-0.047**
	(0.023)	(0.141)	(0.022)
Capital Expenditures	-0.243***	-0.767	-0.272***
	(0.055)	(0.623)	(0.042)
Board Size (lagged)	0.022	0.048	0.009
	(0.017)	(0.086)	(0.007)
Institutional Ownership (lagged)	-0.011	-0.014	-0.005
	(0.015)	(0.114)	(0.008)
Strategic Ownership (lagged)	-0.01	0.148	-0.012*
	(0.015)	(0.118)	(0.007)
Constant	0.352***	-0.831	0.107***
	(0.07)	(0.54)	(0.031)

Observations	6606	6606	6606
Country, Industry & Year Controls	Yes	Yes	Yes
R-squared	0.141	0.108	0.761
Standard Errors (by firm)	Clustered	Clustered	Clustered
Method	FE	FE	POLS

Notes: This Table shows the effects of insider ownership on capital allocation decisions. **Excess Cash** is the positive residuals from the cash holdings estimation in Model (4) in Hypothesis 1. **Q1** and **Q4** are dummy variables that indicate if a firm is within the highest or lowest quartile of insider ownership, respectively. Model (1R)includes size-adjusted quartiles based on Appendix 6. Model (2R) uses the natural logarithm of Cash Holdings as its dependent variable. Model (3R) includes a lagged cash holdings variable as an independent to handle unobserved firm heterogeneity. **Size** is proxied by each firm's natural logarithm of total assets. **Net Working Capital** is Net Working Capital, excluding cash, over Total Assets. **Cash Flow** represents cash from operations divided by Total Assets. **Cash Flow Volatility** is the average industry cash flow volatility during the preceding four years. **Leverage** is total debt over Total Assets. **Market to Book** is calculated by the book value of assets and market value of equity, subtracted from the book value of equity, divided by total assets. **R&D Intensity** is measured as total R&D expenses divided by annual sales. The **Dividend Indicator** is a dummy variable that takes the value 1 if the firm paid a dividend during the last year and zero otherwise. **Acquisition** and **Capex Intensity** is capital spent on acquisition and capex divided by Total Assets. **Board Size** is the number of board members divided by the log of Total Assets. **Institutional** and **Strategic Ownership** represents the total number of shares held by institutions or strategic owners divided by the total number of outstanding shares. All regressions include dummy variables controlling for **Year, Industry,** and **Country** effects. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix 10: Robustness Tests Hypothesis 2 and 3

Model	(4R)	(5R)	(6R)	(7R)	(8R)	(9R)
Dependent Variable	ACQ_TA	CAPEX_TA	Pay_To_share	ACQ_TA	CAPEX_TA	Pay_To_share
Excess Cash (lagged)	0.069*	0.012	0.059***	-0.021	0.044	0.025
	(0.039)	(0.012)	(0.023)	(0.043)	(0.033)	(0.039)
Q1 Insider	0.011	-0.008	-0.007	0.001	-0.004	-0.005
	(0.011)	(0.006)	(0.005)	(0.008)	(0.006)	(0.004)
Q4 Insider	0.002	0.004	0.000	0.016	0.015	-0.007
	(0.012)	(0.006)	(0.007)	(0.014)	(0.010)	(0.006)
Q1*CASH	-0.080**	0.008	0.047*	0.057	-0.091	0.089*
	(0.040)	(0.031)	(0.025)	(0.053)	(0.072)	(0.053)
Q4*CASH	-0.022	-0.004	-0.007	0.017	-0.107**	0.120*
	(0.061)	(0.029)	(0.031)	(0.053)	(0.050)	(0.072)
Size	0.004	0.007***	-0.012***	-0.003	0.009**	0.000
	(0.006)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)
Net Working Capital	-0.029	0.005	0.022	0.004	-0.026	0.028
	(0.035)	(0.017)	(0.017)	(0.019)	(0.017)	(0.029)
Cash Flow	0.027**	(0.004)	0.034***	0.022	0.013	0.045**
	(0.013)	(0.004)	(0.007)	(0.024)	(0.013)	(0.020)
Market-To-Book	-0.002	0.001**	0.003***	0.000	0.009	0.031
	(0.002)	(0.001)	(0.001)	(0.009)	(0.007)	(0.090)
Board Size (lagged)	-0.001	-0.004	-0.016**	0.014	0.001	0.003
	(0.018)	(0.005)	(0.007)	(0.036)	(0.020)	(0.012)
Institutional ownership (lagged)	0.013	-0.011	0.010	0.019	-0.006	0.083
	(0.020)	(0.014)	(0.012)	(0.015)	(0.021)	(0.127)
Strategic Ownership (lagged)	0.001	0.006	0.008	0.007	0.008	0.028
	(0.026)	(0.012)	(0.012)	(0.014)	(0.157)	(0.019)
Constant	-0.001	-0.024	0.128***	0.034	-0.036	0.024
	(0.063)	(0.023)	(0.028)	(0.061)	(0.052)	(0.036)
Observations	2215	2215	2215	1107	1107	1107
Country, Industry & Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.017	0.036	0.115	0.026	0.084	0.137
Standard Errors (by firm)	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Method	FE	FE	FE	FE	FE	FE

Notes: This table shows the effects of insider ownership on capital allocation decisions. The dependent variables are **ACQ_TA, CAPEX_TA and Pay_To_Share**. **Excess Cash** is the positive residuals from the cash holdings estimation in Model (4) in Hypothesis 1. **Q1** and **Q4** are dummy variables that indicate whether a firm is within the highest or lowest quartile of insider ownership. **Q1*CASH** and **Q4*CASH** are interaction terms representing the product of the insider quartile multiplicated with the excess cash variable. These interaction terms measure the joint effect of insider ownership and spending of excess cash. **Size** is proxied by each firm's natural logarithm of total assets. **Net Working Capital** is the Net Working Capital excluding cash over Total Assets. **Cash Flow** represents cash from operations divided by Total Assets. **Market to Book** is calculated by the book value of assets and market value of equity, subtracted from the book value of equity, divided by total assets. **Board Size** is the number of board members divided by the

Appendix 11: Regression models re-estimated with Fixed Effect

The following models are re-estimations of models (5) through (10) with Fixed Effects model. All models using Fixed Effects for Hypothesis 2_{1-3} and 3_{1-3} are given by their respective numbers, followed by the letter *b*.

$$\Delta ACQ\_TA_{i,t} = \beta_0 + \beta_1 ExcessCash_{i,t-1} + \beta_2 InsiderQ1_{i,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,t-1}*ExcessCash_{i,t-1} + \beta_5 InsiderQ4_{i,t-1}*ExcessCash_{i,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + FE + \varepsilon_{i,t}$$

(Model 5b)

$$\Delta CapEx\_TA_{i,t} = \beta_0 + \beta_1 ExcessCash_{i,t-1} + \beta_2 InsiderQ1_{i,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,t-1}*ExcessCash_{i,t-1} + \beta_5 InsiderQ4_{i,t-1}*ExcessCash_{i,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + FE + \varepsilon_{i,t}$$

(Model 6b)

$$\Delta Pay\_To\_Share\_TA_{i,t} = \beta_0 + \beta_1 ExcessCash_{i,t-1} + \beta_2 InsiderQ1_{i,-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{1i,t-1}*ExcessCash_{i,t-1} + \beta_5 InsiderQ4_{i,t-1}*ExcessCash_{i,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + FE + \varepsilon_{i,t}$$

(Model 7b)

$$\Delta ACQ\_TA_{i,t} = \beta_0 + \beta_1 ExcessCash_{i,t-1} + \beta_2 InsiderQ1_{i,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,t-1}*ExcessCash_{i,t-1} + \beta_5 InsiderQ4_{i,t-1}*ExcessCash_{i,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + FE + \varepsilon_{i,t}$$

(Model 8b)

$$\Delta CapEx\_TA_{i,t} = \beta_0 + \beta_1 ExcessCash_{i,t-1} + \beta_2 InsiderQ1_{i,t-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{i,t-1}*ExcessCash_{i,t-1} + \beta_5 InsiderQ4_{i,t-1}*ExcessCash_{i,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + FE + \varepsilon_{i,t}$$

(Model 9b)

$$\Delta Pay\_To\_Share\_TA_{i,t} = \beta_0 + \beta_1 ExcessCash_{i,t-1} + \beta_2 InsiderQ1_{i,-1} + \beta_3 InsiderQ4_{i,t-1} +$$
$$\beta_4 InsiderQ1_{1i,t-1}*ExcessCash_{i,t-1} + \beta_5 InsiderQ4_{i,t-1}*ExcessCash_{i,t-1} + \beta_6 \sum(Control\ Variables) + year,$$
$$indu\ \&\ country + FE + \varepsilon_{i,t}$$

(Model 10b)

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