

BI Norwegian Business School

Master Thesis

Master of Science in Business, Major in Finance

Is Managerial Ownership a Determinant of Cash Holdings?
An Empirical Investigation of Corporations Listed at the
Oslo Stock Exchange.

Examination code and name:
GRA 19003 Master Thesis

Submission date:
19.08.2016

Supervisor:
Charlotte Østergaard

Name
Knut Erlend Malmin
Vegard Solberg

This thesis is a part of the MSc programme at BI Norwegian Business School. The school takes no responsibility for the methods used, results found, and conclusions drawn.

Abstract

In this master thesis, we investigate managerial ownership as a possible determinant of corporate cash holdings in a sample of Norwegian corporations listed at the Oslo Stock Exchange. We focus on the importance of managerial ownership as a disciplinary factor with respect to how companies deploy cash, in addition to interrelated factors such as corporate governance and controlling owners, leverage, and growth opportunities. We fail to find evidence in support of managerial ownership affecting cash holdings when we only control for general firm-specific characteristics. However, under some circumstances, i.e. when we interact managerial ownership with a proxy for growth opportunities (MKTBOOK), we find that managerial ownership has a significant negative effect on cash holdings. Given that our empirical findings, to a large extent, do not support a statistically significant relationship between managerial ownership and cash holdings, we cannot unambiguously motivate and recommend initiation of managerial ownership with the purpose of solving a potential agency conflict between shareholders and managers.

Table of Content

Abstract	1
1 Introduction and Problem Formulation	2
2 Background, Theoretical Framework, and Hypotheses	4
2.1 <i>Background and Theoretical Framework</i>	4
2.1.1 Managerial Ownership – Incentive Alignment Effect	4
2.1.2 Managerial Ownership – Managerial Risk Aversion Effect	6
2.1.3 Corporate Governance and Controlling Owners	7
2.1.4 Leverage	9
2.1.5 Growth Opportunities	9
2.1.6 Other Determinants of Cash Holdings	10
2.2 <i>Hypotheses</i>	11
3 Data	12
3.1 <i>Description of Data</i>	12
3.2 <i>Overall Filtering of Data</i>	13
3.3 <i>Specific Filtering of Data</i>	13
3.4 <i>Descriptive Statistics</i>	15
3.5 <i>Variables</i>	16
3.5.1 Variables in the main Empirical Investigation	16
3.5.2 Additional Variables in the Extended Empirical Investigations	19
4 Empirical Methodology and Models	20
4.1 <i>Methodology</i>	20
4.1.1 Overall Methodology	20
4.1.2 Statistical Validity Checks	20
4.2 <i>Models</i>	22
5 Empirical Results	23
6 Conclusion	34
7 References	36
8 Appendices	39
9 Preliminary Thesis Report	43

1 Introduction and Problem Formulation

Already in the 17th century, Adam Smith warned contemporary investors about the risks involved with investing in the new organizational form, the corporation. Because those investing in the corporation and those managing the corporation often were different people with different interests, Smith argued that if there were no established mechanisms of control, the managers could follow their own self-interest in order to enrich themselves at the expense of the owners.

The management of excess cash (cash holdings over and above the needed level of cash to finance positive NPV projects) is typically one source of conflict of interest between shareholders and managers. Jensen (1986) describes how the decisions of how to deploy cash are central to the conflict of interest. In particular, Jensen states that managers have incentives to cause their firms to grow beyond the optimal size, as growth increases the available resources under the managers' control. Hence, managers might prioritise accumulation of excess cash for pure growth purposes rather than distributing it as dividends to the shareholders.

To solve the explained agency conflict between shareholders and managers with respect to cash holdings, managerial ownership, as a corporate governance mechanism, is suggested both theoretically and empirically to be an effective tool. Recent empirical research, such as Ozkan and Ozkan's (2004) study on UK firms indicates that managerial ownership exerts influence on corporate cash holdings. The shareholders' and the managers' interests are assumed to be more aligned as managerial ownership increase, and hence, distribution of excess cash as dividends is assumed to be prioritised to accumulation of excess cash for other purposes, such as value decreasing acquisitions to achieve growth.

In recent years, the empirical literature on the determinants of cash holdings has grown in size. However, only some, such as Ozkan and Ozkan (2004) and Opler et al. (1999), have explicitly investigated the effect of managerial ownership as a determinant of cash holdings. From our point of view, a research to reveal whether or not managerial ownership aligns the interests of shareholders and managers, with respect to cash holdings, is important. Cash holdings represent a considerable fraction of a corporation's total asset base (in listed Norwegian corporations about an average of 13 %) and in that sense, determinants of cash

holdings are important. The fact that the average cash-to-assets ratio for US industrial firms more than doubled from 1980 to 2006, as documented by Bates, Kahle, and Stulz (2009), do also motivate further investigations of determinants of cash holdings. If managerial ownership motivates distribution of excess cash and free cash flows after investments in positive NPV projects, corporations have a basis for solving the agency conflict, for example through initiating and motivating managerial ownership, and introducing bonus- and option programmes in management compensation.

In this master thesis, we empirically investigate whether or not managerial ownership influence cash holdings in corporations listed at the Oslo Stock Exchange, primarily Norwegian corporations. To our knowledge, there has not been done such a focused study of the relationship between managerial ownership and cash holdings in corporations listed at the Oslo Stock Exchange before. Our aim is therefore to contribute to the literature by analysing these corporations. Because of institutional and regulatory differences between Norway, the UK and other countries, such as different corporate governance structures, it is not given that results from previous studies carry over to Norwegian corporations. We apply the empirical methods of Ozkan and Ozkan (2004), and estimate multiple cross-sectional regressions using cash holdings as our dependent variable and managerial ownership as our independent variable. A detailed explanation of the variables, including the control variables, is provided in Section 3. A detailed explanation of the empirical methods and models is provided in Section 4.

In addition to investigating and analysing the specific relationship between managerial ownership and cash holdings, we also investigate and analyse this relationship controlling for corporate governance and controlling owners, leverage, and growth opportunities. These three factors are particularly relevant because of their interrelated relationship with managerial ownership and cash holdings. Controlling owners may discipline managers by using their own power to distribute dividends. Leverage may discipline managers in terms of obligated interest payments, and growth opportunities may better align the interests of shareholders and managers with the respect to growth.

In the empirical investigation performed in this thesis, we fail to find evidence in support of managerial ownership affecting cash holdings when we only control for general firm-specific characteristics. However, under some circumstances we find a significant relationship. When we interact managerial ownership with a proxy for growth opportunities (MKTBOOK), we find that managerial ownership has a negative and significant relationship with cash holdings. Given that our empirical findings, to a large extent, do not support a statistically significant relationship between managerial ownership and cash holdings, we cannot, on an unambiguous basis, recommend initiation of managerial ownership as means to mitigate the potential agency conflict between shareholders and managers.

The rest of thesis is organized as follows. Section 2 outlines the background, theoretical and empirical framework, and hypotheses that form the basis of the investigation. Section 3 presents the data gathered and used in the investigation together with a detailed explanation of the variables. Section 4 describes the methodology for the investigation. Section 5 outlines the empirical results. Section 6 concludes upon the empirical results. Finally, Section 7 and 8 provides references and appendices.

2 Background, Theoretical Framework, and Hypotheses

2.1 Background and Theoretical Framework

2.1.1 Managerial Ownership – Incentive Alignment Effect

Agency theory, and in particular the agency conflict between shareholders and managers with respect to how to deploy cash, forms the fundamental basis for the investigation performed in this thesis. Agency theory is often used to describe the relationship between shareholders and managers. The interests of the shareholders (principals) may include increasing the distribution of dividends, increasing the share price (firm value), and increasing the price-earnings ratio. In contrast, the managers (agents) may have, among others, incentives to increase the size of the firm.

In his seminal paper, Jensen (1986) argues that managers have incentives to follow their own self-interest at the expense of shareholders. Jensen argues that managers have incentives to accumulate excess cash in order to increase their own

power by growing the size of the firm, and hence, control more resources. The larger the size of the firm, the more resources the managers control, and also the better their performance may be perceived externally.

Furthermore, following Jensen's (1986, 2) definition of free cash flow "*...cash flow in excess of that required to fund all projects that have positive net present value when discounted at the relevant cost of capital*", Jensen suggests that investments using free cash flows results in negative NPV investments. Hence, if managers are free to invest the free cash flows generated at a firm, it will be at the expense of the shareholders.

In addition to the motive of increased firm size, managers may also have incentives to accumulate excess cash in order to increase their personal wealth, for example by paying themselves higher salaries, buying expensive company cars, only buying business class airplane tickets, and similar.

If we assume that both the principals and the agents act as utility maximizers, it is likely that the agents will not always act in the best interest of the principals. With respect to the relationship between managerial ownership and cash holdings, our primary expectation is that managerial ownership is an aligning factor in the agency conflict. Following Jensen's Free Cash Flow Hypothesis, and empirical research such as Chen (2008), we expect a lower level of cash holdings with increased managerial ownership, i.e. a negative relationship when holding other factors constant.

Among other factors, we hold the general debt level constant. The shareholders may adjust the debt level such that there won't be any excess cash available for use. However, there may be factors such as bankruptcy costs and a wish for dividend yield to shareholders that lower the debt level from an optimal level considering handling the agency conflict.

Our primary expectation of negative correlation between managerial ownership and cash holdings is mainly due to the expectation of increased wishes of the management to distribute dividends and perform other efficient and value creating activities, instead of accumulating cash for their own benefits.

According to Jensen and Meckling (1976), as managerial ownership increase the manager's incentives are more likely to be aligned with that of shareholders, because the managers now bear part of the costs related to unproductive use and value decreasing activities. Furthermore, the expectation of lower agency costs due to the alignment of interests are also likely to increase the firm's ability to raise external capital at a lower cost. This will further reduce the firms' incentives to accumulate cash internally. This hypothesis will be discussed in more depth when we explain the Trade-Off Model and The Pecking Order Theory.

To sum up, managerial ownership can be a relevant corporate governance mechanism in order to align the interests of shareholders and managers, in particular with respect to the management of excess cash.

2.1.2 Managerial Ownership – Managerial Risk Aversion Effect

In contrast to the expected incentive alignment effect, it is possible that managerial ownership can affect cash holdings positively. One possible reason for that is managerial risk aversion. Increased managerial ownership can imply that a manager will hold a less diversified portfolio where his wealth and the return on that wealth are explicitly tied to the firm. This may cause the manager to be more risk averse than the other shareholders, provided the assumption that the other shareholders are well diversified, and hence, the manager will like the company to invest in assets with low risk such as cash. Dimitris Papanikolaou with the Kellogg School of Management, and Vasia Panousi with the Federal Reserve Board (2012), documented that when the idiosyncratic risk of a firm rises, investment falls, and more so when the managers owns a larger fraction of the firm. They further documented that firms with a higher level of managerial ownership holds a higher level of cash relative to the firms' total book value of assets.

The net effect of the two effects, the incentive alignment effect and the managerial risk aversion effect, is expected to impact the possible relationship between managerial ownership and cash holdings.

As evident from Ozkan and Ozkan's (2004) study of UK firms, the relationship between managerial ownership and cash holdings can be non-monotonic.

This means that whether the relationship is negative or positive depends on the current level of managerial ownership. Ozkan and Ozkan find that if the level of managerial ownership is low, the incentive alignment effect is valid. When the level of managerial ownership is already at a high level, Ozkan and Ozkan find that a further increase might result in more cash being held, i.e. there might be a positive relationship. The authors call this effect the entrenchment effect. The authors suggest that one argument for this effect could be that when managerial ownership is high, the managers' ability to resist outside pressure increase, and hence, they hold more cash given that they want to obtain private benefits and follow their own self-interest. That said, Ozkan and Ozkan do not present any theoretical basis for the entrenchment effect and further they do not conclude upon this effect. From our perspective, it could be the case that such non-monotonic relationship is due to a change in the net effect of the incentive alignment effect and the managerial risk aversion effect, i.e. that the managerial risk aversion effect starts to dominate the incentive alignment effect when managerial ownership reach a certain level. In the empirical investigation performed in this thesis, we analyse the possibility of a non-monotonic relationship between managerial ownership and cash holdings.

2.1.3 Corporate Governance and Controlling Owners

Previous studies have provided some evidence of the relationship between corporate governance and cash holdings. Corporate governance is a broad topic, but in our, more narrow perspective, we focus on the part of corporate governance that considers mechanisms by which the managers are monitored and controlled to act in line with their shareholders interests. In a study on US firms by Harford et al. (2008), there is evidence that firms with weak corporate governance structures tend to hold lower cash reserves. Harford et al. define firms with weak corporate governance structures as firms with few controlling shareholders, few insiders with ownership, and several independent board members, among others. Their explanation for the found relationship is that managers that operate within weak governance structures choose to spend cash quickly on growth opportunities, especially acquisitions, instead of hoarding the cash. In contrast, Kusnadi's (2003) study of firms in Singapore finds evidence that firms with weak corporate governance structures tend to hold higher cash reserves. The author suggest that within weak governance structures, the shareholders lack power in

forcing managers to distribute excess cash as dividends. This is supported by Dittmar, Mahrt-Smith, and Servaes (2003) who finds evidence that investors in countries with poor shareholder protection – weak corporate governance structures – cannot force managers to disgorge excessive cash, and thus, such firms hold more cash. The authors investigated firms in a sample of 11 000 firms across 45 countries. The conflicting documented evidence suggests that there might be a trade-off regarding corporate governance and cash holdings that depends on the benefits for managers of excess spending of cash today versus the benefits of excess spending of cash in the future.

Another factor linked to the relationship between corporate governance and cash holdings is that modern shareholders typically are well diversified where each of their investments only represent a fraction of their total investments. This implies that some investors may lack incentives to monitor the performance of the specific firms they are invested in. This makes it easier for managers to pursue their own interests through opportunistic behaviour, which again may have an impact on cash holdings. The globalisation of capital markets, where shareholders have different owner interests across borders could also devote less focus on monitoring managers. Given these trends, increased managerial ownership could be a relevant element for solving the agency conflict, and increase the effectiveness and value creation in firms without having to introduce other monitoring structures and activities.

In our empirical investigation, we investigate the impact of one particular proxy for corporate governance, namely controlling owners. The costs of a possible conflict of interest between shareholders and managers with respect to cash holdings might be reduced if a firm has powerful and active shareholders with high incentives to perform close monitoring of managers. It is easier for few large shareholders to control managers than it is for many relatively smaller shareholders. Hence, the shareholders can exercise more control over the managers who would like to retain cash, and force them to distribute the cash as dividends. Therefore, powerful and active shareholders could lead to a lower impact of managerial ownership on cash holdings.

That said, a concentrated ownership structure with a few controlling owners may also affect cash holdings positively. Demsetz and Lehn (1985) argue that a higher ownership concentration in a corporation will imply that the investors who own high proportions of the total outstanding shares are likely to hold less diversified portfolios where their wealth and the return on that wealth are explicitly tied to the firm. This may lead to a more risk-averse behaviour. In other words, there might be a risk aversion effect affecting cash holdings similar to the managerial risk aversion effect as explained in Section 2.1.2.

2.1.4 Leverage

Similar to the effect of controlling owners, a proxy for corporate governance, leverage may also act as a disciplinarian factor with respect to how managers deploy cash. Higher leverage implies that managers are less able to deploy cash for personal usage and investments in growth opportunities. This is due to the increased obligated interest payments and repayments to creditors. The managers have to focus on generating cash flows to prevent illiquidity and threat of bankruptcy. Therefore, increased managerial ownership might be a factor reducing leverage as the managers now have more power in order to reduce the general debt level and thereby release cash to follow their own self-interest.

2.1.5 Growth Opportunities

The last factor that we will investigate is whether or not growth opportunities affect the relationship between managerial ownership and cash. It might be the case that managerial ownership has positive effect on cash holdings in corporations with high growth opportunities. The reason for that is that now both shareholders and managers have an incentive - a value-increasing incentive - to accumulate cash with the purpose of financing future projects. In addition, with higher growth opportunities, the costs of external financing – debt and equity – may become more expensive given higher asymmetric information costs and higher risk. Increased costs of external financing will further strengthen the incentive to accumulate cash internally with the purpose of financing new projects at a reasonable cost of capital.

2.1.6 Other Determinants of Cash Holdings

In the empirical literature on determinants of cash holdings there are typically three main theoretical frameworks underlying the investigation. These are the Trade-Off Model, the Pecking Order Theory, and the Jensen's Free Cash Flow Hypothesis. In light of our defined topic, the relationship between managerial ownership and cash holdings, the explained Jensen's Free Cash Flow Hypothesis is the more relevant of these. However, all of the three main theoretical frameworks are important, especially with respect to the other determinants of cash holdings, such as those used as control variables in our empirical investigation.

Trade-Off Model

The Trade-Off Model postulates that firms identify their optimal level of cash holdings by weighting the marginal costs and marginal benefits of holding cash (Ferreira and Vilela, 2004). The main benefits of holding cash are the reduced likelihood of financial distress, the reduced need of accessing capital markets, and hence, the reduced transaction costs of raising capital (the transaction costs motive), and the availability of capital to finance new projects even when market conditions are unfavourable (the precautionary motive). The two main costs of holding cash are the opportunity cost of capital invested in liquid assets, and the tax disadvantage - that the interest income on cash is taxable and that it is taxed twice from a shareholder perspective through the tax on the interest income itself and the tax on the dividends distributed to the shareholders.

Pecking Order Theory

The Pecking Order Theory, introduced by Myers (1984) and supported by the theoretical framework of Myers and Majluf (1984), states that firms finance their investments following a given order. This theory, also called the financing order theory, states that firms finance their investments first with internal funds, then with safe debt and risky debt, and finally with equity. The order of financing is in particular based on firms' wishes to minimise asymmetric information costs related to financing. Myers and Majluf (1984) find that asymmetric information between managers and investors leads to external financing being more costly. This is because outsiders do not have the same information about the firms' financial positions and future investment opportunities compared with what the

managers know about the firms and their prospects. Therefore, investors discount the provided financing sufficiently to compensate for the information asymmetry.

In Section 3 (Data), we provide the underlying theoretical basis for the control variables in our empirical investigation. We relate this to the theoretical frameworks explained above.

2.2 Hypotheses

Based on the theories discussed regarding the possible implications of managerial ownership on cash holdings and the possible interrelated factors to the relationship, we empirically investigate the following hypotheses:

Incentive Alignment Effect of Managerial Ownership on Cash Holdings:

- Hypothesis 1
 - We expect a *negative* relationship between managerial ownership and cash holdings (increased managerial ownership, less cash holdings)

Managerial Risk Aversion Effect of Managerial Ownership on Cash Holdings:

- Hypothesis 2
 - We expect a *positive* relationship between managerial ownership and cash holdings (increased managerial ownership, more cash holdings)

Non-Monotonic Relationship Between Managerial Ownership and Cash Holdings:

- Hypothesis 3
 - We expect a non-linear relationship between managerial ownership and cash holdings. At a low level of managerial ownership, we expect a negative relationship. At a higher level of managerial ownership, we expect a positive relationship.

Effect of Controlling Owners on the Relationship Between Managerial Ownership and Cash Holdings:

- Hypothesis 4
 - We expect a negative relationship between concentrated ownership (controlling owners) and cash holdings

Effect of Leverage on the Relationship Between Managerial Ownership and Cash Holdings:

- Hypothesis 5
 - We expect a negative relationship between managerial ownership and leverage, which in turn affect cash holdings

Effect of Growth Opportunities on the Relationship Between Managerial Ownership and Cash Holdings:

- Hypothesis 6
 - We expect a positive relationship between managerial ownership and cash holdings when we control for growth opportunities, i.e. we expect a positive interaction term coefficient

3 Data

3.1 Description of Data

For our empirical investigation and analysis, we use data provided by the Centre for Corporate Governance Research (CCGR) at BI Norwegian Business School. The dataset includes financial data on corporations listed at the Oslo Stock Exchange. Because the data on market value of equity, dividend payments, and managerial ownership was incomplete or missing, we have collected this data from other sources. The data on market value of equity is obtained from Datastream, the data on dividend payments is obtained from the Oslo Stock Exchange, and the managerial ownership data is manually collected from each of the companies' annual reports.

Following the likes of Ozkan and Ozkan (2004) and La Porta, Silanes and Shleifer (1999), which argue that because ownership structures tends to be relatively stable

over a certain period of time, we only obtain data on managerial ownership for one year.

3.2 Overall Filtering of Data

To improve the quality of our data, we apply several filters in line with that of previous empirical research. Firstly, we exclude certain firms according to their two-digit Standard Industrial Classification (SIC) code (Appendix 4). We exclude firms that operates within the financial sector (SIC code 64, 65, and 66), because of reasons such as different regulations and requirements to cash holdings, e.g., to ensure liquidity. Also, we exclude utility- and real estate firms (SIC code 35, 36, 37, 38, 39, and 68, respectively), because the cash holdings of these firms can be subject to specific statutory- and capital requirements. Secondly, we delete firm year observation where we are unable to identify the firm by name or other means of identification, because this prevents us from collecting managerial ownership data. Thirdly, to avoid non-operating and pure holding companies, we delete companies with operating revenue below 1 million and total assets equal to zero. Lastly, we only keep companies that have 5 consecutive firm year observations.

Main Sample

After the overall filtering, we arrive at our main sample consisting of 88 firms for the chosen years, 2009 to 2013.

3.3 Specific Filtering of Data

Our main sample is relatively small compared to that of previous studies. For example, Ozkan and Ozkan (2004) have 839 listed UK firms in their sample compared to our 88 listed Norwegian firms. Furthermore, the Oslo Stock Exchange is to a large extent dominated by shipping firms (SIC code 50). As we will see in later detail, this might affect the regression results. We therefore construct two additional samples to try and take this into account. In addition, we construct a fourth sample where leverage act as the dependent variable.

Large Sample

A small sample, such as our main sample, can contribute to statically regressions not being very robust. In a small sample, there might be lack of variations between some of the variables that do not reflect the true population.

For example, from investigating a scatterplot of our cash holdings variable and our managerial ownership variable – see Figure 1 in Section 5 - we see that there is little cross-sectional variation between the two. To try and cope with this, we create a larger sample. Here we deviate from the methodology of Ozkan and Ozkan by removing the requirement that every company must have continuous data for 2009 through 2013. This results in an additional 12 firms and a total sample size of 100 firms for our large sample.

Sample Without Shipping Firms

The Oslo Stock Exchange is to a large extent dominated by one industry, the shipping industry (SIC code 50). In our large sample there are a total of 17 shipping firms. The shipping industry was a booming industry up until the recent financial crisis. In the years following 2007/2008, shipping firms have performed poorly relative to the other firms operating in the other industries represented on the Oslo Stock Exchange. In addition, we see from the dataset that there is limited managerial ownership in the shipping industry. For these reasons, we create a sample without shipping firms by deleting all 17 shipping firms from the large sample. This results in a sample without shipping firms that consist of 80 firms.

Leverage Sample

To investigate whether or not leverage can be used to discipline managers, we construct a fourth sample where we measure leverage in 2014 and the independent variables, now including cash holdings, as the average over the period 2009 to 2012.

The described filtering gives us four different samples that we conduct regression analysis on. These are our main sample, large sample, sample without shipping firms, and leverage sample.

3.4 Descriptive Statistics

Table 1

Descriptive statistics for our main sample.

	Mean	Min	25%	Median	75%	Max
CASH	0.130	0.010	0.048	0.080	0.166	0.697
DIVIDEND	0.031	0.000	0.000	0.010	0.030	0.526
LEVERAGE	0.557	0.114	0.473	0.584	0.674	0.900
NON-CASH LIQUIDITY	0.004	-0.421	-0.071	-0.030	0.109	0.290
MKTBOOK	1.873	0.737	0.944	1.166	1.690	32.418
SIZE	21.560	17.791	20.200	21.661	22.980	27.250
MANAGERIAL OWNERSHIP	0.034	0.000	0.001	0.003	0.012	0.629

This table presents sample characteristics for 88 firms over the period 2009-2014. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. LEVERAGE is the ratio of total debt to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding.

In Table 1, we present the relevant descriptive statistics for our main sample. For the sake of brevity, we include the relevant descriptive statistics for our large sample, the sample without shipping firms, and the leverage sample in Appendix 1 (Table 7, 8, and 9, respectively).

The mean cash ratio is 13 % and the median cash ratio is 8 %. These results are to a large extent similar to that reported in similar studies from other countries. Ozkan and Ozkan (2004) report a mean cash ratio of 9,9 % and a median cash ratio of 5,9 % for UK listed firms. Opler et al. (1999) report a mean cash ratio of 17 % and a median cash ratio of 6,5 % for US firms. As argued by Ozkan and Ozkan, the relatively high reported mean cash ratio of Opler et al. is likely due to subtraction of cash from total assets in the denominator of the ratio, which in turn inflates the ratio.

On average, the firms in our sample appear to a large extent to hold similar, but slightly higher cash holdings relative to that of UK and US firms. The slightly higher cash ratios in our sample might be due to the investigation period, which is right after the financial crisis. It can be that the firms, on average, hold more cash after the financial crisis to avoid future financial distress and reduce bankruptcy costs. It can also be that the higher cash ratios are due to a lower valuation of the firms' total book value of assets. Likely it is a combination of both. In addition, our sample size is relatively small and there are large variations in terms of cash ratios within the sample. This implies that firms with very high cash ratios affect the mean upwards. However, also the median, a more robust measure of the

central tendency is slightly higher in our sample compared to the samples in the other studies.

With respect to managerial ownership, we report a mean of 3,4 % and a median of 0,03 %. The minimum and maximum managerial ownership is equal to 0 % and 62,9 %. We note that there are some differences with respect to managerial ownership in the sample, but for most of the firms the managerial ownership level is low. Compared to the findings of Ozkan and Ozkan, the equity ownership held by the managers in our sample is significantly lower. Ozkan and Ozkan report a mean managerial ownership of 14.1 % and a median 5.1 %. A possible reason for the noted deviation can be that the general ownership structure in Norway differs from that in the UK, especially in terms of ownership concentration and controlling owners. Bøhren and Ødegaard (2000) document that the average fraction of the firms' total outstanding voting equity that is held by the largest, second largest, and third largest owners, is higher in Norway compared to the UK.

3.5 Variables

3.5.1 Variables in the main Empirical Investigation

Dependent Variable

Cash Holdings

Cash holdings serves as our dependent variable, and in order to compare our results with previous research, we follow Ozkan and Ozkan (2004), and define cash holdings as:

$$\text{Cash} = \frac{\text{Cash and Cash Equivalents}}{\text{Total Assets}}$$

Independent Variable

Managerial Ownership

We follow Ozkan and Ozkan (2004), and define managerial ownership as:

$$\text{Managerial Ownership} = \frac{\text{Number of Shares Held by the Managers}}{\text{Total Outstanding Shares}}$$

We expect the incentive alignment effect to dominate the managerial risk aversion effect, and hence, we expect a negative relationship between managerial ownership and cash holdings. That said we do recognise that the relationship

might be positive as a consequence of a dominating managerial risk aversion effect.

Predicted sign = - (+)

Control Variables

Among others, we follow Niskanen and Steijvers (2011), Ozkan and Ozkan (2004), and Opler et al. (1999), and include firm-specific characteristics that in theory and previous empirical research have explained corporate cash holdings. This enables us to test the relative impact of managerial ownership on cash holdings by controlling for other factors that are suggested to determine cash holdings. For estimation purposes and reasons to be discussed in Section 4, among others a small sample size, we limit our selection of control variables to a limited number.

Dividend

We follow Ozkan and Ozkan (2004), and define dividend as:

$$\text{Dividend} = \frac{\text{Dividend Payments}}{\text{Total Assets}}$$

In line with Ozkan and Ozkan (2004) and Opler et al. (1999), we expect corporations that pay dividends to hold less cash, as they are more capable of raising funds when needed by cutting dividends. A corporation that currently pays dividends can raise funds at lower cost by reducing its dividend payments, in contrast to a corporation that does not pay dividends which has to use the capital markets to raise funds. Hence, we expect a negative relationship between dividend and cash holdings. We expect the explained effect, related to the transaction cost motive of cash holdings, to dominate the effect that dividend paying corporations will hold more cash than non-dividend paying corporations to avoid situations in which they are short of cash to support their dividend payments. Brav et al. (2005) document that CFO's are reluctant to cut dividends.

Predicted sign = -

Leverage

We follow Ozkan and Ozkan (2004), and define leverage as:

$$\text{Leverage} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

In line with Ozkan and Ozkan (2004), we expect the Pecking-Order Theory and the increased monitoring of management to dominate the increased probability of financial distress. Hence, we expect a negative relationship between leverage and cash holdings. We expect less cash holdings in higher leveraged corporations, according to the Pecking-Order Theory, simply due to the logic that the corporations will spend their cash prior to taking on new debt. The fact that higher leverage implies higher obligated interest payments do also support a negative relationship.

Predicted sign = -

Non-Cash Liquidity

We follow Ozkan and Ozkan (2004), and define Non-Cash Liquidity as:

$$\text{Non - Cash Liquidity} = \frac{\text{Net Working Capital} - \text{Cash}}{\text{Total Assets}}$$

In line with Ferreira and Vilela (2004), we expect that corporations can use their non-cash liquid assets, defined as net working capital minus cash, as a substitute for cash holdings. Hence, we expect a negative relationship between non-cash liquidity and cash holdings.

Predicted sign = -

Growth Opportunities (MKTBOOK)

We follow Ozkan and Ozkan (2004), and define growth opportunities (MKTBOOK) as:

$$\text{Growth} = \frac{\text{Book Value of Assets} - \text{Book Value of Equity} + \text{Market Value of Equity}}{\text{Total Book Value of Assets}}$$

As growth opportunities increases, we expect increased cost of bankruptcy, increased cost of external capital because of greater information asymmetry, and increased precautionary motive for holding cash, according to the Trade-Off Model. Hence, we expect a positive relationship between growth opportunities and cash holdings.

Predicted sign = +

Size

We follow Ozkan and Ozkan (2004), and define firm size as:

$$\text{Size} = \ln(\text{Total Assets})$$

In line with a wide range of previous empirical studies, we expect economies of scale with respect to the transaction cost motive for holding cash (the Trade-Off Model). We expect larger corporations to have greater access to external capital and a lower cost of external capital. Hence, we expect a negative relationship between firm size and cash holdings.

Predicted sign = -

Industry Dummies

We include industry dummies to allow the estimated intercept to vary between industry groups. This ensures that our estimation accounts for industry specific factors that could otherwise bias our results. We include six industry group dummies, given in Appendix 4.

$$ID_i = \text{ID equal to one for industry group } i \text{ and zero otherwise. } i = 1, 2, \dots, 6$$

3.5.2 Additional Variables in the Extended Empirical Investigations

Corporate Governance and Controlling Owners

Ownership Share

= the percentage of total outstanding equity held by shareholders that own more than 10 % of total outstanding equity each

Level of Growth Opportunities

$$\text{Level of Growth Opportunities} = \text{Managerial Ownership} \times \text{MKTBOOK}$$

4 Empirical Methodology and Models

4.1 Methodology

4.1.1 Overall Methodology

Given the obtained focused and complete dataset, we have the opportunity to investigate our primary research question – whether or not managerial ownership is a determinant of cash holdings. In addition we investigate the relative impact of corporate governance and controlling owners, leverage, and growth opportunities related to the primary relationship.

In order to investigate our primary research question, we adopt the empirical methods of Ozkan and Ozkan (2004) to create our main regressions. That is, we estimate multiple cross-sectional regressions using data from 2009 to 2013. For our control variables, which we defined in Section 3, we use average values over 4 years (2009 to 2012) in an attempt to mitigate problems with short-term fluctuations and extreme values. We measure cash holdings in 2013 to account for the fact that the independent variables are likely to not have an immediate effect on cash holdings. Managerial ownership data is collected only in 2012 as Ozkan and Ozkan (2004) and La Porta et al. (2002), among others, argue that it is reasonable to assume that the managerial equity ownership structure is relatively stable over a certain time period. Therefore, measuring managerial ownership only in 2012 will, with a high probability, not yield significant bias in our results. To account for industry effects, we conduct all of our regressions with industry dummies. We utilize EViews for our empirical investigation.

4.1.2 Statistical Validity Checks

Heteroscedasticity

The presence of heteroscedasticity can affect standard errors, resulting in misleading statistical inference (Brooks, 2004).

To test for this, Brooks suggests conducting the White's test, integrated in the EViews software. We do so, and test the following hypothesis:

H_0 : Homoscedasticity vs. H_1 : Heteroscedasticity

If we detect heteroscedasticity, we utilize White's heteroscedasticity robust standard errors to correct for this.

Endogeneity

With our regression model, we assume that the independent variables explain the variation in the dependent variable, cash holdings. However, it is also possible that cash holdings explain some of the variation in one or more of the independent variables. One reason for this could be that investment policy and financial decisions are decided simultaneously. We therefore run reduced form regressions for all our samples where we leave out the dividend and leverage variables, as suggested by Opler et al. (1999). Because there are no significant differences in these regressions we do not report the results. That said, considering the amount of previous empirical literature that follows similar methodologies to ours, we proceed with our methodology.

Multicollinearity

To check for multicollinearity in the data, we investigate the degree of correlation between the independent variables. If the correlation between one or more variables is above a certain threshold, multicollinearity might be a problem. The literature suggests different thresholds with no clear-cut answer as to when this might be a problem. In our primary sample, the highest correlation reported is 0.746. This is the correlation between the dividend variable and the MKTBOOK variable. The correlations between the other variables are at lower levels, and thus, we do not consider multicollinearity to be a problem in our sample. Correlation matrices for each sample are reported in Table 10, 11, 12 and 13, presented in Appendix 2.

4.2 Models

Below we present an overview of the different regression models we run.

Model 1 and 2 are run on the main sample, large sample and the sample without shipping firms, while Model 3 is run only on the main sample and the large sample. The reason for the latter, as mentioned, is because the sample without shipping firms only consists of 80 firms. Detailed explanations of the models are provided in Section 5.

Model 1 (Regression (2.1), (3.1), and (4.1)):

$$\begin{aligned} \text{Cash}_i = & \beta_0 + \beta_1 \text{Managerial Ownership}_i + \beta_2 \text{Dividend}_i + \beta_3 \text{Leverage} \\ & + \beta_4 \text{Non - Cash Liquidity}_i + \beta_5 \text{MKTBOOK}_i + \beta_6 \text{Firm Size}_i \\ & + \beta_7 \text{Industry Dummies}_i + \varepsilon_i \end{aligned}$$

Model 2 (Regression (2.2), (3.2), and (4.2)):

$$\begin{aligned} \text{Cash}_i = & \beta_0 + \beta_1 \text{Managerial Ownership}_i + \beta_2 \text{Dividend}_i + \beta_3 \text{Leverage}_i \\ & + \beta_4 \text{Non - Cash Liquidity}_i + \beta_5 \text{MKTBOOK}_i + \beta_6 \text{Firm Size}_i \\ & + \beta_6 \text{Managerial Ownership} * \text{MKTBOOK} \\ & + \beta_7 \text{Industry Dummies}_i + \varepsilon_i \end{aligned}$$

Model 3 (Regression (2.3) and (3.3)):

$$\begin{aligned} \text{Cash}_i = & \beta_0 + \beta_1 \text{Managerial Ownership}_i + \beta_2 \text{Dividend}_i + \beta_3 \text{Leverage}_i \\ & + \beta_4 \text{Non - Cash Liquidity}_i + \beta_5 \text{MKTBOOK}_i + \beta_6 \text{Firm Size}_i \\ & + \beta_7 \text{Managerial Ownership}^2 + \beta_8 \text{Managerial Ownership}^3 \\ & + \beta_9 \text{Industry Dummies}_i + \varepsilon_i \end{aligned}$$

Model 4 (Regression (4.3)):

$$\begin{aligned} \text{Cash}_i = & \beta_0 + \beta_1 \text{Managerial Ownership}_i + \beta_3 \text{Leverage}_i \\ & + \beta_4 \text{Non - Cash Liquidity}_i + \beta_5 \text{Firm Size}_i + \varepsilon_i \end{aligned}$$

Model 5 (Regression (5.1)):

$$\begin{aligned} \text{Leverage}_i = & \beta_0 + \beta_1 \text{Managerial Ownership}_i + \beta_2 \text{Dividend}_i \\ & + \beta_3 \text{Cash Holdings}_i + \beta_4 \text{Non - Cash Liquidity}_i + \beta_5 \text{MKTBOOK}_i \\ & + \beta_6 \text{Firm Size}_i + \beta_7 \text{Industry Dummies}_i + \varepsilon_i \end{aligned}$$

Model 6 (Regression (6.2)):

$$\begin{aligned} \text{Cash}_i = & \beta_0 + \beta_1 \text{Managerial Ownership}_i + \beta_2 \text{Dividend}_i + \beta_3 \text{Leverage}_i \\ & + \beta_4 \text{Non - Cash Liquidity}_i + \beta_5 \text{MKTBOOK}_i + \beta_6 \text{Firm Size}_i \\ & + \beta_7 \text{Ownership Share} + \beta_8 \text{Industry Dummies}_i + \varepsilon_i \end{aligned}$$

5 Empirical Results

In this section, we present the results for the different cross-sectional regressions. Table 2 and 6 report the results using our main sample, and Table 3, 4, and 5, report the results using the large sample, sample without shipping firms, and the leverage sample, respectively. For our main regression – reported in Table 2 – we discuss each result in detail, while we for the other regressions focus on the economically and statistically significant results.

With an R^2 ranging from 0.278 to 0.387, our models explains at most 38,7 % of the variation in cash holdings. This result is similar to that of comparable studies.

In Table 2, 3, 4, and 5, we find no evidence of heteroscedasticity. In Table 6, we find evidence of heteroscedasticity at a 5% level, and we therefore adjust standard errors in this model using White's correction.

Main regression model

Main Sample – Sample that strictly follows the methodology of Ozkan and Ozkan (2004)

Table 2

Cross-sectional regressions of cash holdings on managerial ownership and other firm characteristics on our main sample. No heteroscedasticity detected.

Independent variables	Predicted Sign	(2.1)	(2.2)	(2.3)
Dividend	-	-0.384 (0.181)	-0.427 (0.147)	-0.387 (0.183)
Leverage	-	-0.260*** (0.010)	-0.262*** (0.010)	-0.258** (0.012)
Non-Cash Liquidity	-	-0.341** (0.016)	-0.348** (0.015)	-0.347** (0.016)
MKTBOOK	+	0.009 (0.135)	0.003 (0.814)	0.009 (0.133)
Size	-	-0.018** (0.021)	-0.018** (0.022)	-0.017 (0.025)
Managerial Ownership	+ -	-0.114 (0.417)	-0.456 (0.363)	-0.211 (0.804)
Managerial Ownership ²	+ -			1.264 (0.774)
Managerial Ownership ³	+ -			-1.996 (0.700)
Mananagerial Ownership*MKTBOOK			0.320 (0.476)	
Intercept		0.664*** (0.000)	0.674*** (0.000)	0.656*** (0.000)
R^2		0.326	0.331	0.330
N		88	88	88

This table presents three cross-sectional regressions predicting cash holdings. The dependent variable is CASH, measured as the ratio of total cash and cash equivalents to total assets. LEVERAGE is the ratio of total debt to total assets. DIVIDEND is the ratio of dividend payments to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. MANAGERIAL OWNERSHIP² and MANAGERIAL OWNERSHIP³ are the square and cube of the ratio of number of shares held by managers to total number of shares outstanding. All regressions include industry dummies defined by their 2-digit SIC code. P-values are reported in parentheses. ***, ** and * indicate coefficient significant at the 1%, 5% and 10% level, respectively.

Table 2 presents the estimation results for our cross-sectional regression model using our main sample. Regression (2.1) reports the regression results for the basic model, testing Hypothesis 1 and 2. In regression (2.2), we interact managerial ownership with growth opportunities (MKTBOOK) to test Hypothesis 1, 2, and 6. In regression (2.3), we include the squared and cubed managerial ownership variable in order to test Hypothesis 1, 2, and 3.

From regression (2.1), we see that leverage, non-cash liquidity, and firm size are all statistically significant at a 5 % level. Dividend, MKTBOOK, and managerial ownership are all statistically insignificant at all levels, but have the hypothesized sign.

As expected, increased leverage implies decreased cash holdings. Taking on more debt strengthen the implications of the Pecking Order Theory, it discipline managers, and it increases the obligated interest payments, directly affecting the cash available to hoard. Furthermore, it enables the debt issuers, e.g. banks, to engage in more active monitoring of the firms' investment policies which includes restricting the managers' ability to spend cash, e.g. through covenants.

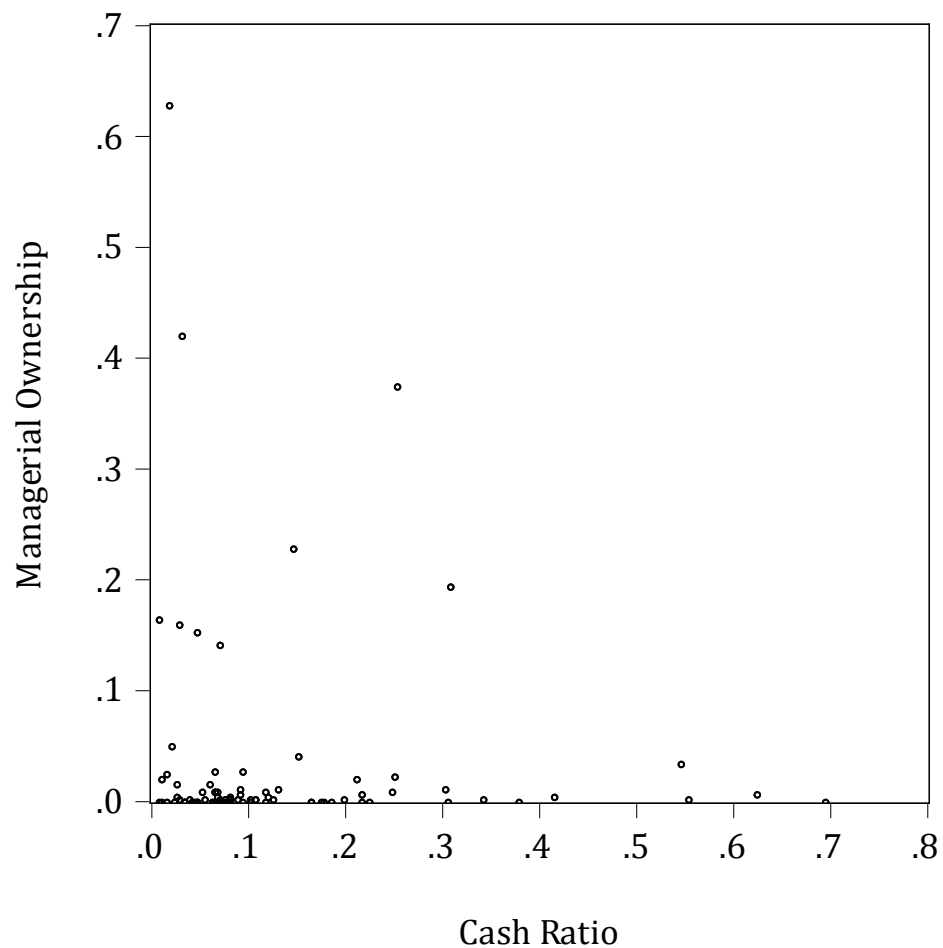
Our second significant result is that corporations use their non-cash liquid assets (net working capital less cash), as substitute for cash holdings. Increased non-cash liquid assets decrease cash holdings. This result is both in line with Ferreira and Vilela (2004) and Ozkan and Ozkan (2004).

Our third, and last significant result is that increased firm size decrease cash holdings. Large firms tend to be able to access external capital at a lower cost, as previously explained. Our result is further consistent with the significant findings in US firms by Opler et al. (1999), but not with that of the findings in UK firms by Ozkan and Ozkan (2004).

For our main variable, managerial ownership, we find a negative relationship in support of Hypothesis 1, the incentive alignment effect. However, the result is highly insignificant, and there are several possible reasons for this. One reason is that managerial ownership simply does not have a significant effect on cash holdings in firms listed at the Oslo Stock Exchange. However, as previously discussed, our small sample size with little cross-sectional variation might be a contributing factor to the insignificant relationship. Manual inspection of our data shows that more than half of the firms in our sample have a managerial ownership level below 1 %. Furthermore, approximately 70 % of the firms have a cash ratio below the mean. This relationship is visualized in Figure 1 below. In contrast to our insignificant relationship, both Opler et al. (1999) and Ozkan and Ozkan (2004) find a significant relationship between managerial ownership and cash

holdings. The former finds a significant positive relationship in US firms for managerial ownership below 5 %, and an insignificant negative relationship for managerial ownership above 5 %. The latter finds a significant non-monotonic relationship in UK firms, where for lower levels of managerial ownership (0 % to 24 %) the relationship is negative and for higher levels of managerial ownership (24 % to 64 %) the relationship is positive. Both papers use significantly larger samples with 2 400 and 839 firms, respectively. Also, the descriptive statistics reported by Ozkan and Ozkan shows that they have much more cross-sectional variation between managerial ownership and cash in their data.

Figure 1 – Scatterplot of Managerial Ownership and Cash



Lastly, looking at the remaining variables, we see that both the dividend variable and MKTBOOK variable are in line with the economic effect explained in Section 3. However, neither of them is statistically significant. The insignificant dividend variable is consistent with the findings for UK listed firms; however, it is not

consistent with the findings of US firms, where it is found to be a significant determinant of cash holdings.

From our second regression, regression (2.2), we find no evidence that support Hypothesis 1, 2, or 6. Interacting managerial ownership with MKTBOOK does not lead to any significant changes. Leverage, non-cash liquidity, and firm size are still economically and statistically significant, while managerial ownership and the new interaction variable are both highly insignificant.

From regression (2.3), we get similar results to regression (2.2). The effect of the control variables stays the same and we find no evidence in support of Hypothesis 3, that is that there is a non-linear relationship between cash holdings and managerial ownership.

Regressions using additional samples

As described in Section 3, we construct and apply additional samples to investigate whether or not this changes any of our results. In Table 3 we present regression results using the larger sample, and in Table 4 we present results using the sample without shipping firms. In Table 5 we present results using the leverage sample. In Table 6 we test whether or not cash holdings is affected by ownership concentration using our main sample

Large Sample – Extended sample that includes firms being listed in the period 2009 to 2013

From regression (3.1), (3.2), and (3.3), presented in Table 3 below, we see that also for this sample leverage, non-cash liquidity, and firm size are highly significant with the same economic effect. Dividend and MKTBOOK continue to have no significant effect. In regression (3.1) and (3.3), all of the tested hypotheses are rejected.

However, from regression (3.2), we find that managerial ownership is a negative and significant determinant of cash holdings at the 10 % level. Further, we see that the interaction term of managerial ownership and MKTBOOK is positive and also significant at the 10 % level. This suggests that the effect of managerial ownership determining cash holdings changes in the presence of growth

opportunities. The sole effect of managerial ownership, i.e. if growth opportunities are equal to zero and other factors are kept constant, is negative. However, as evident from the positive interaction term coefficient, the effect of managerial ownership on cash holdings is more positive in firms with higher growth opportunities. This is in line with Hypothesis 6, which states that growth opportunities should align the incentives between managers and shareholders with respect to cash holdings.

Table 3

Cross-sectional regressions of cash holdings on managerial ownership and other firm characteristics on our large sample. No heteroscedasticity detected.

Independent variables	Predicted Sign	(3.1)	(3.2)	(3.3)
Dividend	-	-0.124 (0.603)	-0.168 (0.479)	-0.125 (0.605)
Leverage	-	-0.283*** (0.003)	-0.289*** (0.002)	-0.282*** (0.003)
Non-Cash Liquidity	-	-0.250** (0.020)	-0.274** (0.011)	-0.253** (0.020)
MKTBOOK	+	0.003 (0.609)	-0.008 (0.355)	0.003 (0.600)
Size	-	-0.015** (0.041)	-0.015** (0.043)	-0.016** (0.047)
Managerial Ownership	+ -	-0.077 (0.571)	-0.662* (0.080)	-0.126 (0.875)
Managerial Ownership ²	+ -			1.074 (0.796)
Managerial Ownership ³	+ -			-1.833 (0.709)
Mananagerial Ownership*MKTBOOK			0.543* (0.097)	
Intercept		0.610*** (0.000)	0.630*** (0.000)	0.602*** (0.000)
R^2		0.278	0.297	0.278
N		100	100	100

This table presents three cross-sectional regressions predicting cash holdings. The dependent variable is CASH, measured as the ratio of total cash and cash equivalents to total assets. LEVERAGE is the ratio of total debt to total assets. DIVIDEND is the ratio of dividend payments to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. MANAGERIAL OWNERSHIP² and MANAGERIAL OWNERSHIP³ are the square and cube of the ratio of number of shares held by managers to total number of shares outstanding. All regressions include industry dummies defined by their 2-digit SIC code. P-values are reported in parentheses. ***, ** and * indicate coefficient significant at the 1%, 5% and 10% level, respectively.

Sample Without Shipping Firms

Again, from Table 4 below we see that leverage, non-cash liquidity, and firm size continue to be highly significant determinants of cash holdings across samples. Furthermore, from regression (4.2) we see that after removing shipping firms, managerial ownership as a determinant of cash holdings is still significant at the 10 % level, but now the interaction term is no longer significant. In regression (4.3), because of the smaller sample size used, and the fact all of the previous investigations of a non-linear relationship was highly insignificant, we try to remove the previously used control variables that have been consistently insignificant (Dividend and MKTBOOK) to allow for more degrees of freedom. As Table 4 reports, this does not result in any significant changes.

Table 4

Cross-sectional regressions of cash holdings on managerial ownership and other firm characteristics on our sample without shipping firms. No heteroscedasticity detected.

Independent variables	Predicted Sign	(4.1)	(4.2)	(4.3)
Dividend	-	-0.094 (0.713)	-0.140 (0.583)	
Leverage	-	-0.398*** (0.001)	-0.410*** (0.001)	-0.392*** (0.001)
Non-Cash Liquidity	-	-0.345** (0.010)	-0.376*** (0.003)	-0.341*** (0.005)
MKTBOOK	+	0.001 (0.890)	-0.010 (0.264)	
Size	-	-0.018** (0.039)	-0.0170** (0.044)	-0.017** (0.029)
Managerial Ownership	+ -	-0.182 (0.266)	-0.780* (0.060)	-0.180 (0.263)
Mananagerial Ownership*MKTBOOK			0.563 (0.115)	
Intercept		0.723*** (0.000)	0.741*** (0.000)	0.715*** (0.000)
R^2		0.331	0.356	0.330
N		80	80	80

This table presents three cross-sectional regressions predicting cash holdings. The dependent variable is CASH, measured as the ratio of total cash and cash equivalents to total assets. LEVERAGE is the ratio of total debt to total assets. DIVIDEND is the ratio of dividend payments to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. All regressions include industry dummies defined by their 2-digit SIC code. P-values are reported in parentheses. ***, ** and * indicate coefficient significant at the 1%, 5% and 10% level, respectively.

Leverage Sample – Sample that follows the methodology of Ozkan and Ozkan (2004), but with leverage as the dependent variable

In addition to the main regressions, we investigate managerial ownership as a determinant of leverage to see if managerial ownership decrease leverage as explained in Section 2.1.4 and expressed in Hypothesis 5.

Table 5

Cross-sectional regressions of leverage on managerial ownership and other firm characteristics on our leverage sample. No heteroscedasticity detected.

Independent variables	(5.1)
Cash	-0.639*** (0.000)
Dividend	0.046 (0.904)
Non-Cash Liquidity	-1.019*** (0.000)
MKTBOOK	-0.001 (0.899)
Size	-0.004 (0.730)
Managerial Ownership	0.088 (0.636)
Intercept	0.677*** (0.005)
R^2	0.434
N	88

This table presents one cross-sectional regression predicting leverage. The dependent variable is LEVERAGE measured as the ratio of total debt to total assets. CASH is the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. All regressions include industry dummies defined by their 2-digit SIC code. P-values are reported in parentheses. ***, ** and * indicate coefficient significant at the 1%, 5% and 10% level, respectively.

From Table 5, we see that managerial ownership is a positive and insignificant determinant of leverage. Based on this, we reject Hypothesis 5, concluding that managerial ownership does not have a significant negative effect on leverage. Further, more specifically with respect to cash holdings we cannot conclude that managers with increased managerial power adjust the general debt level with the purpose of increasing cash flows in order to follow their own self-interests. However, one could argue that given the large and negative cash variable being highly significant, it is possible that managerial ownership has an effect on

leverage through cash holdings. That is, if managerial ownership affects cash holdings, it is likely that it affects leverage through its effect on cash holdings.

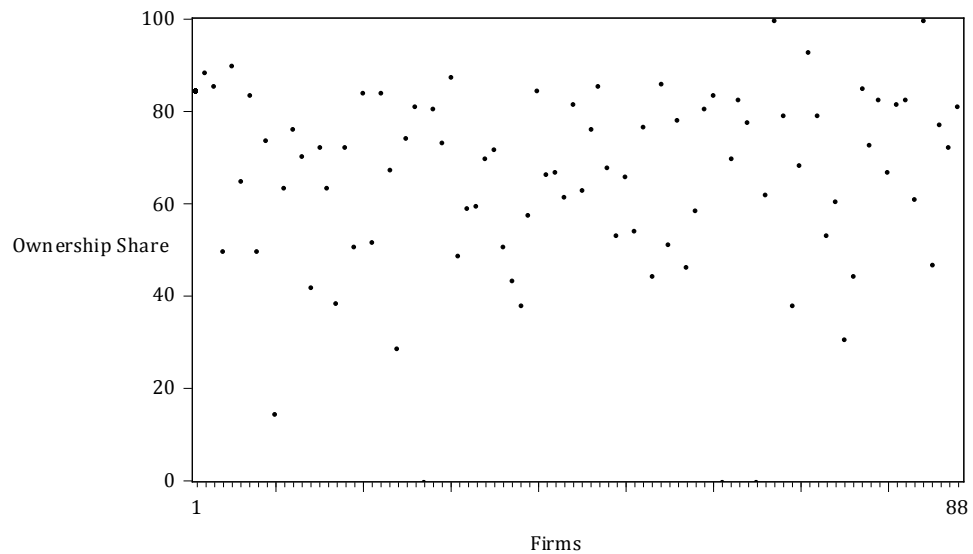
Controlling Owners

As described in Section 2, the costs of a possible conflict of interest between shareholders and managers with respect to cash holdings might be reduced if a firm has powerful and active shareholders, and hence, the relative impact of managerial ownership as a determinant of cash holdings might be reduced.

In order to investigate the effect of ownership structure and controlling owners, and test Hypothesis 4, we estimate two additional regressions using our main sample. The results from these regressions are reported in Table 6 below.

The ownership share variable is obtained directly from CCGR, and represents the percentage of the total outstanding shares held by shareholders that own more than 10 % each. This variable is measured in 2013. The variable has a mean of 0.65 and a median equal to 0.69, which indicates that a few large owners largely dominate the firms in our sample. This is visualized in Figure 2 below. However, a problem with this variable is that it does not account for the distribution between each of the shareholders that own more than 10 % of a firm. For example, it can be that between two owners that own more than 10 % of the shares, one owns 70 % while the other only owns 15 %. For this reason, the results must be evaluated with care, keeping in mind that the variable might be, to some degree, an inaccurate proxy for ownership concentration and controlling owners.

Figure 2 – Percentage Of Total Outstanding Equity Owned By Shareholders That Own More Than 10% Of The Total Outstanding Equity Each For Firms In Our Main Sample



From regression (6.1) and (6.2), we see that the same significant variables as before continue to be significant, however, now the MKTBOOK variable is also significant at the 5 % level. In addition, from (6.2) we see that when including ownership share, dividend become significant at the 10 % level together with a slight increase in R^2 . Managerial ownership is negative and insignificant. The proxy for concentrated ownership/controlling owners is negative and significant at the 10 % level. Holding other factors constant, this indicates that in firms where there are shareholders that own more than 10 % each, and where these shareholders own a large percentage of the total outstanding equity, the firms hold less cash. A possible reason for this is that in these firms the shareholders take a more active role in monitoring and disciplining managers, resulting in less freedom for managers to take actions motivated by their own self-interest. This may ensure a more value creating use of cash. We find evidence supporting Hypothesis 4, supporting the notion that the ownership structure of firms listed on the Oslo Stock Exchange may affect the relationship between managerial ownership and cash holdings.

Table 6

Cross-sectional regressions of cash holdings on managerial ownership, other firm characteristics and ownership concentration on our main sample. Heteroscedasticity detected.

Independent variables	Predicted Sign	(6.1)	(6.2)
Dividend	-	-0.384 (0.136)	-0.524* (0.056)
Leverage	-	-0.260** (0.045)	-0.250** (0.044)
Non-Cash Liquidity	-	-0.341* (0.096)	-0.349* (0.064)
MKTBOOK	+	0.009** (0.047)	0.011** (0.020)
Size	-	-0.018** (0.012)	-0.017** (0.012)
Managerial Ownership	+ -	-0.114 (0.311)	-0.107 (0.351)
Ownership Share	-		-0.177* (0.077)
Intercept		0.664*** (0.000)	0.750*** (0.000)
R^2		0.326	0.387
N		88	88

This table presents two cross-sectional regressions predicting cash holdings. The dependent variable is CASH, measured as the ratio of total cash and cash equivalents to total assets. LEVERAGE is the ratio of total debt to total assets. DIVIDEND is the ratio of dividend payments to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. OWNERSHIP SHARE is a measure of the percentage equity owned by each shareholder that own more than 10% each. All regressions include industry dummies defined by their 2-digit SIC code. P-values are reported in parentheses. ***, ** and * indicate coefficient significant at the 1%, 5% and 10% level, respectively.

Summary and initial conclusion of the empirical investigations

Overall, the results from our empirical investigation are mixed, especially regarding managerial ownership as a determinant of cash holdings. In Table 14, presented in Appendix 3, we provide a summary and comparison of our main results to that of Ozkan and Ozkan (2004) and Opler et al. (1999).

Referring to regression (3.2) and (4.2), we see that for the sample where we allow more firms to be included, as well for the sample where we delete shipping companies, and when we interact growth opportunities with managerial ownership, the latter becomes significant at the 10 % level. However, because all our samples are small in general, and the fact that the results from the different model specifications are mixed and mostly not significant, we cannot conclude that managerial ownership exerts a significant effect, in one way or another, on

cash holdings for Norwegian firms listed on the Oslo Stock Exchange. One possible reason for the lack of significant managerial ownership variables are the results presented in Figure 2 above. The ownership structure in firms listed on the Oslo Stock Exchange appears to be more concentrated in terms of controlling owners compared to that of the US and UK.

6 Conclusion

In this master thesis, we set out to answer whether or not managerial ownership is a determinant of cash holdings in Norwegian corporations listed at the Oslo Stock Exchange. In addition to controlling for several firm-specific characteristics, we investigated the effect of growth opportunities, leverage, and ownership concentration (controlling owners) on the relationship between managerial ownership and cash holdings.

We fail to find evidence in support of managerial ownership affecting cash holdings when we only control for general firm-specific characteristics. However, we find under some circumstances, i.e. when we interact managerial ownership with a proxy for growth opportunities (MKTBOOK), that managerial ownership has a significant effect on cash holdings. Given that our empirical findings, to a large extent, do not support a statistically significant relationship between managerial ownership and cash holdings, we cannot, on an unambiguous basis, recommend initiation and motivation of managerial ownership with the purpose of solving a potential agency conflict between shareholders and managers.

Considering growth opportunities as an aligning factor in the agency conflict, we find evidence of incentive alignment. In our large sample, we find evidence of the effect of managerial ownership being more positive in firms with higher growth opportunities. In the other samples, we fail to find such a significant relationship.

Considering managerial ownership as a determinant of leverage, we do not find evidence of increased managerial power being used to reduce leverage with the purpose of increasing cash flows, and in turn cash holdings.

When we include ownership concentration (controlling owners) as a determinant of cash holdings in our regression, we find evidence suggesting that managers are to a larger degree monitored when there are shareholders that own more than 10 % of the total outstanding shares each, and where these shareholders own a large fraction of the total outstanding shares.

As previously discussed, there can be several factors explaining our results. One possibility is that managerial ownership simply does not have a significant effect on cash holdings. This is supported by the significant and negative ownership share variable, suggesting a high concentration of ownership for firms in our sample. The fact that a few large owners dominate most of the firms in our sample enables these owners to actively monitor and discipline managers. This restricts the managers' ability to go on unmonitored spending sprees. However, because our dataset fails to meet the standards of comparable research in terms of sample size, we believe that this also likely affects our empirical analysis. Therefore, we do not consider our results exhaustive, and thus, they must be interpreted with care.

We believe that our investigation form a sound basis for further studies regarding the various effects of managerial ownership. For this reason, it would be interesting to see results of a study adopting more advanced econometric techniques, e.g. a time series specification with managerial ownership data collected over several years. It would also be interesting to investigate an extended relationship between managerial ownership, cash holdings, and firm performance/firm value.

7 References

Bates, Thomas W., Kathleen M. Kahle, and Rene Stulz. 2009. "Why Do U.S. Firms Hold So Much More Cash than They Used To?" *Journal of Finance* 64: 1985-2021.

Bøhren, Øyvind and Bernt Arne Ødegaard. 2000. "The ownership structure of Norwegian firms: Characteristics of an outlier". Norwegian School of Management BI.

Brav, Alon, John R. Graham, Campbell R. Harvey, and Roni Michaely. 2005. "Payout policy in the 21st century". *Journal of Financial Economics* 77 (3): 483-527.

Brooks, Chris. 2004. *Introductory Econometrics for Finance*. The ISMA Centre, University of Reading.

Chen, Yenn-Ru. 2008. "Corporate Governance and Cash Holdings: Listed New Economy versus Old Economy Firms". *Corporate Governance: An International Review* 16 (5): 430-442.

Demsetz, Harold and Kenneth Lehn. 1985. "The Structure of Corporate Ownership: Causes and Consequences". *The Journal of Political Economy* 93 (6): 1155-1177.

Dittmar, Amy, Jan Mahrt-Smith, and Henri Servaes. 2003. "International Corporate Governance and Corporate Cash Holdings". *Journal of Financial and Quantitative Analysis* 38 (1): 111-133.

Fahlenbrach, Rüdiger and Rene Stulz. 2009. "Managerial ownership dynamics and firm value". *Journal of Financial Economics* 92 (3): 342-361.

Ferreira, Miguel A. and Antonio S. Vilela. 2004. "Why Do Firms Hold Cash? Evidence from EMU Countries". *European Financial Management* 10 (2): 295-319.

Harford, Jarrad, Sattar A. Mansi, and William F. Maxwell. 2008. "Corporate governance and firm cash holdings in the US". *Journal of Financial Economics*, 87 (3): 535-555.

Jensen, Michael C. 1986. "Agency Costs of Free Cash Flow, Corporate Finance and Takeovers". *American Economic Review* 76 (2): 323-329.

Jensen, Michael C. and William H. Meckling. 1976. "Theory of the firm: Managerial Behaviour, Agency Costs and Ownership Structure". *Journal of Financial Economics* (3): 305-360.

Kusnadi, Yuanto. 2003. "Corporate Cash Holdings, Board Structure, and Ownership Concentration: Evidence from Singapore". Hong Kong University of Science and Technology.

La Porta, Rafael, Florencio Lopez-de-Silanes and Andrei Shleifer. 1999. "Corporate Ownership Around the World". *Journal of Finance* 54 (2): 471- 517.

Martínez-Sola, Cristina, Pedro J. García-Teruel, and Pedro Martínez-Solano. 2013. "Corporate cash holding and firm value". *Applied Economics* 45 (2): 161-170.

Morck, Randall, Andrei Shleifer, and Robert W. Vishny. 1988. "Management ownership and market valuation.". *Journal of Financial Economics* 20: 293-315.

Myers, Stewart C. and Nicholas S. Majluf. 1984. "Corporate financing and investment decisions when firms have information that investors do not have". *Journal of Financial Economics* 13 (2): 187-221.

Niskanen, Mervi and Tensie Steijvers. 2011. "Managerial ownership effects on cash holdings: The case of private family firms". *Accounting and Finance* 53: 537-560.

Opler, Tim, Lee Pinkowitz, Rene Stulz, and Rohan Williamson. 1999. "The determinants and implications of corporate cash holdings". *Journal of Financial Economics* 52: 3-46.

Ozkan, Aydin and Neslihan Ozkan. 2004. "Corporate cash holdings: An empirical investigation of UK companies". *Journal of Banking & Finance* (28): 2103-2134.

Panousi, Vasia and Dimitris Papanikolaou. 2012. "Investment, Idiosyncratic Risk, and Ownership". *The Journal of Finance* 67 (3): 1113-1148.

Stewart C. Myers. 1984. "The Capital Structure Puzzle". *The Journal of Finance*: 39 (3): 574-592.

8 Appendices

Appendix 1 – Descriptive Statistics for our Large Sample, Sample Without Shipping Firms, and Leverage Sample

Table 7

Descriptive statistics for our large sample.

	Mean	Min	25%	Median	75%	Max
CASH	0.126	0.010	0.047	0.078	0.166	0.697
DIVIDEND	0.032	0.000	0.000	0.009	0.030	0.526
LEVERAGE	0.569	0.114	0.472	0.584	0.674	1.493
NON-CASH LIQUIDITY	-0.015	-1.211	-0.073	-0.031	0.104	0.290
MKTBOOK	2.075	0.613	0.953	1.185	1.856	32.418
SIZE	21.458	17.791	20.127	21.462	22.726	27.250
MANAGERIAL OWNERSHIP	0.031	0.000	0.000	0.003	0.010	0.629

This table presents sample characteristics for 100 firms over the period 2009 -2014. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. LEVERAGE is the ratio of total debt to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding.

Table 8

Descriptive statistics for our sample without shipping firms.

	Mean	Min	25%	Median	75%	Max
CASH	0.133	0.010	0.045	0.078	0.182	0.697
DIVIDEND	0.038	0.000	0.000	0.012	0.033	0.526
LEVERAGE	0.563	0.114	0.458	0.584	0.653	1.493
NON-CASH LIQUIDITY	0.001	-1.211	-0.074	-0.005	0.115	0.290
MKTBOOK	2.260	0.737	1.001	1.225	1.949	32.418
SIZE	21.460	17.791	20.127	21.384	22.851	2.250
MANAGERIAL OWNERSHIP	0.029	0.000	0.001	0.003	0.011	0.629

This table presents sample characteristics for 80 firms over the period 2009 -2014. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. LEVERAGE is the ratio of total debt to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding.

Table 9

Descriptive statistics for leverage sample.

	Mean	Min	25%	Median	75%	Max
LEVERAGE	0.562	0.085	0.435	0.574	0.703	1.429
CASH	0.138	0.004	0.058	0.085	0.152	0.759
DIVIDEND	0.031	0.000	0.000	0.010	0.030	0.526
NON-CASH LIQUIDITY	0.004	-0.421	-0.071	-0.030	0.109	0.290
MKTBOOK	1.873	0.737	0.944	1.166	1.690	32.418
SIZE	21.560	17.791	20.200	21.661	22.980	27.250
MANAGERIAL OWNERSHIP	0.034	0.000	0.000	0.003	0.012	0.629

This table presents sample characteristics for 88 firms over the period 2009 -2014. LEVERAGE is the ratio of total debt to total assets. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding.

Appendix 2 – Correlation Matrices for all Samples

Table 10

Correlation matrix for our main sample. All main variables are included.

	CASH	DIVIDEND	LEVERAGE	NON-CASH LIQUIDITY	MANAGERIAL OWNERSHIP	MKTBOOK	SIZE
CASH	1						
DIVIDEND	0.097	1					
LEVERAGE	-0.297	-0.138	1				
NON-CASH LIQUIDITY	-0.168	-0.0157	-0.378	1			
MANAGERIAL OWNERSHIP	-0.065	-0.043	0.123	-0.098	1		
MKTBOOK	0.223	0.746	-0.244	0.116	-0.047	1	
SIZE	-0.353	-0.205	0.203	0.106	-0.141	-0.288	1

This table presents the correlation between the main variables in our study for 88 firms over the period 2009 -2014. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. LEVERAGE is the ratio of total debt to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets.

Table 11

Correlation matrix for our large sample. All main variables are included.

	CASH	DIVIDEND	LEVERAGE	NON-CASH LIQUIDITY	MANAGERIAL OWNERSHIP	MKTBOOK	SIZE
CASH	1						
DIVIDEND	0.097	1					
LEVERAGE	-0.237	-0.196	1				
NON-CASH LIQUIDITY	-0.139	0.049	-0.592	1			
MANAGERIAL OWNERSHIP	-0.053	-0.047	0.069	-0.038	1		
MKTBOOK	0.195	0.725	-0.188	0.011	-0.061	1	
SIZE	-0.328	-0.169	0.102	0.190	-0.127	-0.312	1

This table presents the correlation between the main variables in our study for 100 firms over the period 2009 -2014. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. LEVERAGE is the ratio of total debt to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets.

Table 12

Correlation matrix for our sample without shipping firms. All main variables are included.

	CASH	DIVIDEND	LEVERAGE	NON-CASH LIQUIDITY	MANAGERIAL OWNERSHIP	MKTBOOK	SIZE
CASH	1						
DIVIDEND	0.093	1					
LEVERAGE	-0.253	-0.198	1				
NON-CASH LIQUIDITY	-0.186	0.017	-0.609	1			
MANAGERIAL OWNERSHIP	-0.103	-0.035	0.067	-0.051	1		
MKTBOOK	0.190	0.726	-0.212	-0.005	-0.056	1	
SIZE	-0.337	-0.200	0.086	0.190	-0.114	-0.327	1

This table presents the correlation between the main variables in our study for 80 firms over the period 2009 -2014. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. LEVERAGE is the ratio of total debt to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets.

Table 13

Correlation matrix for our leverage sample. All main variables are included.

	LEVERAGE	CASH	DIVIDEND	NON-CASH LIQUIDITY	MANAGERIAL OWNERSHIP	MKTBOOK	SIZE
LEVERAGE	1						
CASH	-0.297	1					
DIVIDEND	-0.086	0.276	1				
NON-CASH LIQUIDITY	-0.386	-0.285	-0.016	1			
MANAGERIAL OWNERSHIP	0.132	-0.035	-0.043	-0.098	1		
MKTBOOK	-0.206	0.348	0.746	0.116	-0.046	1	
SIZE	0.090	-0.421	-0.205	0.106	-0.141	-0.286	1

This table presents the correlation between the main variables in our study for 80 firms over the period 2009 -2014. CASH is measured as the ratio of total cash and cash equivalents to total assets. DIVIDEND is the ratio of dividend payments to total assets. LEVERAGE is the ratio of total debt to total assets. NON-CASH LIQUIDITY is the ratio of net working capital less cash to total assets. MANAGERIAL OWNERSHIP is the ratio of number of shares held by managers to total number of shares outstanding. MKTBOOK is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. SIZE is the natural log of total assets.

Appendix 3 – Summary of Results

Table 14

Relationship between Managerial Ownership and Cash Holdings controlling for other firm characteristics. A comparison of our empirical findings with that of previous research. We compare our results with Ozkan & Ozkan (2004) and Opler et al. (1999). The definition of some of the variables varies slightly between papers.

Variables	This Paper <i>(Norway)</i>	Ozkan & Ozkan (2004) <i>(U.K)</i>	Opler et al. (1999) <i>(U.S)</i>
Managerial Ownership	- / Yes & No	+ - / Yes & No	+ - / Yes
Dividend	- / No	- / Yes	- / Yes
Leverage	- / Yes	- / Yes	- / Yes
Non-Cash Liquidity	- / Yes	- / Yes	- / Yes
MKTBOOK	- / No	+ / Yes	+ / Yes
Size	- / Yes	+ / Yes	- / Yes

Sign (+-) refers to the whether the variables is found to have a positive (+) or negative (-) effect on cash holdings, or both. "Yes" or "No" refers to wheter or not the variable is significant at the 10 % level or higher.

Appendix 4 – Industry Groups According to Two-Digit SIC Code**Table 15**

Industry dummies according to their two-digit SIC code

SIC	SIC Label
3	Fishing
6, 9	Agriculture, forestry, and mining
10, 16, 17, 20, 22, 24, 25, 26, 27, 28, 29, 30, 31, 33	Manufacturing, chemical products, and metals
41, 42, 43	Construction
46, 47	Trade
49, 50, 51	Transport
58, 61, 62, 69, 71, 72, 80	Service

BI Norwegian Business School – Preliminary
Thesis Report

Master of Science in Business, Finance

Managerial ownership – a determinant of cash holdings in
corporations traded at the Oslo Stock Exchange?

Submission date:
15.01.2016

Supervisor:
Charlotte Østergaard

Name and student ID:
Knut Erlend Malmin - 0914947
Vegard Solberg - 0913746

Content

1. Introduction	1
2. Problem Formulation.....	4
3. Background and Literature Review	4
4. Theoretical Framework	7
5. Possible Hypotheses.....	9
6. Data.....	9
7. Methodology	11
8. References	13

1. Introduction

Already in the 17th century, Adam Smith warned contemporary investors about the risks involved with investing in the new organizational form, the corporation. Because those investing in the firm and those managing the firm often were different people with different interests, he argued that if there were no established mechanisms of control, the managers could follow their own self-interest in order to enrich themselves at the expense of the owners.

The management of cash is typically one source of such conflict of interest. Jensen (1986) describes how the decisions of how to deploy cash are central to the conflict of interest between shareholders and managers. In particular, Jensen states that managers have incentives to cause their firms to grow beyond the optimal size, as growth increases the managers' power by increasing the available resources under their control. Also, to be able to create growth, accumulation of cash is relevant. Accumulation of cash will be prioritised to distribution of dividends to shareholders. Furthermore, Jensen argues that this conflict of interest is more severe when firms have large free cash flows that can be distributed as dividends, spent internally and used for acquisitions, or simply being held as cash. Harford (1999) complements Jensen by providing evidence that firms holding excess cash are more likely to make value-decreasing acquisitions.

The arguments of Adam Smith formed the very basis of the mechanisms we today refer to as corporate governance. Among its many definitions, The Organization for Economic Co-operation and Development (OECD) defines corporate governance as “...*a set of relationships between a company's management, its board, its shareholders and other stakeholders. Corporate governance also... (and) ...provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined.*” As apparent from the definition, corporate governance is essentially a tool for managing agency problems that exist in companies with a clear separation of ownership and control, such as in many publicly listed companies today.

Implicitly, managerial ownership is therefore an important corporate governance characteristic. Recent research, such as Ozkan and Ozkan's (2004) study on UK

firms has indicated that managerial ownership exerts influence on corporate cash holdings. Ozkan and Ozkan find a non-monotonic relationship between managerial ownership and cash holdings. More specifically, the authors find that an increase in managerial ownership within the range of 0 % to 30 % of the total outstanding equity results in lower cash holdings. The managers' and the owners' interests are assumed to be more aligned – the incentive alignment effect – as managerial ownership increases, and hence, as an example, paying out dividend is assumed to be prioritised to accumulating cash for other purposes, such as acquisitions for pure growth purposes.

In recent years, the empirical literature on determinants of cash holdings has grown in size (ex. Opler et al, 1999; Ozkan and Ozkan, 2004; Isshaq, Bopking and Onumah, 2009; Niskanen and Steijvers, 2011; Kalcheva and Lins, 2007). Out of these, only some, such as Ozkan and Ozkan (2004) and Opler et al (1999) have explicitly investigated the effect of managerial ownership as a determinant of cash holdings.

In our master thesis we want to empirically investigate whether managerial ownership has a significant impact on cash holdings in corporations traded at the Oslo Stock Exchange (primarily Norwegian corporations). We define managerial ownership as the percentage of the total outstanding equity owned by the directors. As stated above, previous empirical research suggests that managerial ownership can align the interests of managers and shareholders, and thereby improve the efficiency of the corporations' cash management, and thus also increase the value of the corporations. Our research can form a basis for future research regarding implications of a possible relationship between managerial ownership and cash holdings on the valuations of corporations.

From our point of view, a research to reveal whether managerial ownership does align the interests of shareholders and managers in terms of cash management is important. If we find that managerial ownership increase capital discipline and motivates distribution of excess cash/free cash flow rather than accumulation of cash for growth motivated value-decreasing activities, we form a basis for considerations regarding increased managerial ownership in Norwegian corporations. Such research can also give indications of benefits regarding

management compensation through bonus- and option programmes with the purpose of solving the underlying agency conflict.

In our master thesis we will apply the empirical methods of Ozkan and Ozkan (2004). Ozkan and Ozkan investigate the empirical determinants of corporate cash holdings for a sample of UK firms with a particular focus on the effects of managerial ownership. We will focus on the nature of the relationship between managerial ownership and cash holdings, and further outline some of the relevant perspectives regarding implications on valuations of corporations. However, an empirical investigation of the implications on valuations is outside the scope of this thesis. Because of institutional and regulatory differences between Norway, the UK and other European countries, it is not given that results from previous studies, such as Ozkan and Ozkan's study, are comparable to ours.

To address the issue of managerial ownership and corporate cash holdings we will first review existing theoretical and empirical studies, which will form the basis of our investigation. Then, we will outline the theoretical framework that supports our choice of topic. Next, we will proceed by collecting data from annual reports, the Centre for Corporate Governance Research at BI Norwegian Business School, Datastream, and the Oslo Stock Exchange. The last step involves empirically investigating the data collected, which will reveal to what extent there is a relationship between managerial ownership and cash holdings.

This preliminary report is organized as follows. Section 2 formulates the problem of investigation. Section 3 reviews and discusses relevant theoretical and empirical studies on managerial ownership and cash holdings. Section 4 outlines the theoretical framework that forms the basis of our investigation. Section 5 describes possible hypotheses. Section 6 describes the dataset we plan to test. Finally, section 7 describes the methodology we will use for our investigation.

2. Problem Formulation

In contrast to the main strand of literature on corporate cash holdings that focuses on the general determinants of cash holdings, our primary focus is to investigate the relationship between managerial ownership and cash holdings. Hence, our research question is as follows:

“Managerial ownership - a determinant of cash holdings in corporations traded at the Oslo Stock Exchange? An empirical investigation.”

To our knowledge, there has not been conducted such a study on corporations traded at the Oslo Stock Exchange. Our aim is therefore to contribute to the literature by analysing these corporations. We will compare our results with previous research, mainly Ozkan and Ozkan (2004).

3. Background and Literature Review

Agency Theory

As mentioned above, agency theory forms the fundamental basis of our investigation. Agency theory is often used for describing the relationship between shareholders and managers. The interests of the shareholders (principals) may include increasing the distribution of dividends, increasing the share price (firm value), and increasing the price-earnings ratio. In contrast, managers (agents) have, among others, incentives to increase the size of the firm. The larger the size of the firm, the more resources they control, and the better their performance is perceived. Paying out cash to shareholders will reduce the resources controlled by managers. In addition, managers may for example also have incentives to increase their personal wealth by paying themselves higher salaries, buying expensive company cars, buying business class airplane tickets, and similar. If we assume both principals and agents as utility maximizers, it is likely that the agents will not always act in the best interest of the principals. Regarding the relationship between managerial ownership and cash holdings, our primary expectation is managerial ownership as an aligning factor in the agency conflict. We expect a lower level of cash holdings with increased managerial ownership. This is mainly due to the expectation of increased wishes of the management to distribute dividends and reduced wishes to accumulate cash for growth purposes, for example through future acquisitions. However, alongside this dimension it is also

possible that managerial ownership can affect cash holdings positively, for example as a result of managerial risk aversion. Increased managerial ownership can imply that a respective manager holds a less diversified portfolio where his wealth and return on that wealth is very tied to the firm. This may cause him to be more risk averse than the other shareholders, if we assume the other shareholders are well diversified, and hence the manager will like the company to invest in assets with low risk such as cash.

Corporate Governance

Previous studies have provided some evidence of the relationship between corporate governance and cash holdings. In a study on US firms by Harford et al. (2008), there is evidence that investment in firms with weak corporate governance structures results in lower future profitability and valuations. The argument is that managers operating within weak governance structures choose to spend cash quickly on acquisitions and operational activities instead of hoarding it. In contrast, Kusnadi's (2003) study of firms in Singapore finds evidence that firms with weak corporate governance tend to hold more cash. The author suggest that in weak governance structures, the shareholders lack power in forcing managers to distribute excess cash as dividends. This is supported by, Smith and Servaes (2003) who finds evidence that investors in countries with poor shareholder protection – a proxy for corporate governance – cannot force managers to disgorge excessive cash, and thus such firms hold more cash. The authors investigated firms in a sample of 11,000 firms across 45 countries. The conflicting evidence suggests a trade-off that depends on the benefits of excess spending today or additional flexibility of spending in the future.

Review of related studies

In addition to these two main drivers of interest for our research question, there has been conducted several empirical studies that address corporate cash holdings.

Opler et al (1999) formed the very basis for the recent research regarding cash holdings. They examined determinants and implications of cash holdings, and many of the determinants found in the article will be used as control variables in our empirical investigation. The authors found, among other determinants, that cash flow relative to total assets and the corporations' growth opportunities

determines cash holdings. Further, they find that corporations with managerial ownership lower than 5 % tend to keep more cash and corporations with managerial ownership higher than 5 % tend to keep less cash. They conclude that the positive relationship between managerial ownership and cash holdings for corporations with less than 5 % managerial ownership is due to managerial risk aversion.

Bates, Kahle, and Stulz performed a further investigation of cash holdings in 2009. Bates, Kahle, and Stulz showed that the average cash-to-assets ratio for US industrial firms more than doubled from 1980 to 2006. The overwhelming evolution of cash, which among many factors is due to increased R&D and increased riskiness of cash flows, indicates the relevance of further research regarding corporate cash holdings today.

Looking further at the relationship between managerial ownership and cash holdings, Chen (2008) provides empirical support for the association between agency theory and cash holdings. By examining 1500 American Standard and Poor companies, Chen finds that higher managerial ownership tends to reduce cash holdings when all other variables are considered endogenous. As stated above, such findings have, as far as we know, not been documented for companies traded at the Oslo Stock Exchange.

With respect to managerial ownership and the conflict of interest, a study by Berle and Means (1932), cited in Kusnadi (2003), suggest that some investors lack incentive to monitor the performance of the specific firms they are invested in. The reason for that is because modern shareholders typically are well diversified where each investment only represents a fraction of their total investment. This again makes it easier for managers to pursue their self-interest through opportunistic behaviour, which again will have an impact on cash holdings. The globalisation of capital markets, where shareholders have owner interests across borders and are more diversified than before could devote less focus on monitoring managers in the different companies. Therefore, given this trend, increased managerial ownership could be an important element of controlling the conflict of interest, and increase the effectiveness and value creation in companies without having to initiate other monitoring structures and activities.

Martínez-Sola, García-Teruel, and Martínez-Solano (2013) study the relationship between cash holdings and firm value. They find a concave relationship between cash holdings and firm value in US industrial firms (2003-2007), verifying the existence of an optimum level of cash holdings. Deviations above and below the optimal level can thereby decrease the firm value. The relationship between cash holdings and firm value motivates the investigation of managerial ownership as a determinant of cash holdings.

Finally, briefly looking at the relationship between managerial ownership and firm value, we can note several findings. When controlling for past stock returns, Fahlenbrach and Stulz (2009) finds that a large increase in managerial ownership increase Tobin's q , the market value of a company relative to the book value of the company. In their seminal work on Fortune 500 firms, Morck, Shleifer and Vishny (1988) also suggest that firms where managers have greater ownership achieve better performance and higher value. In fact, the authors find that firm value increases when managers own up to 5% of outstanding common stock. Such a relationship motivates the possibility of a consistent interrelated relationship between managerial ownership, cash holdings, and firm value.

4. Theoretical Framework

In the empirical literature on determinants of cash holding there are typically three main theoretical frameworks that form the basis of investigation. These are the Trade-Off Model, the Pecking Order Theory, and Jensen's Free Cash Flow Hypothesis. In light of our defined topic, the latter is the more relevant of these, and hence, this forms the underlying basis for our investigation.

Jensen's Free Cash Flow Hypothesis

In his seminal paper, Jensen (1986) argues that managers have incentives to follow their own self-interest at the expense of shareholders. For example, Jensen argues that managers have an incentive to accumulate excess cash in order to increase their own power by growing the company, and hence, controlling more resources. Also, following Jensen's (1986, 2) definition of free cash flow as "*...cash flow in excess of that required to fund all projects that have positive net present value when discounted at the relevant cost of capital*", he suggests that investments using the free cash flow results in negative NPV investments. Hence,

if managers are free to invest the free cash flow, it will be at the expense of the shareholders interests. Furthermore, Jensen argues that a low level of managerial ownership can increase the conflict of interest because it will increase the misalignment of managers and shareholders interests. This suggests that managerial ownership can be a relevant corporate governance mechanism in order to align the interests of managers and shareholders, in particular in terms of distribution of free cash flows to shareholders, which again will affect cash holdings and is likely to affect firm value.

Managerial Ownership – Incentive Effect vs. Entrenchment Effect

Much of the academic work that investigates cash holdings supports the fact that managerial ownership can mitigate the conflict of interest between shareholders and managers. As managerial ownership increases, manager's incentives are more likely to be aligned with that of shareholders (Jensen and Meckling, 1976), and hence, managers are more likely to perform efficient and value creating activities. Based on this, one would expect managerial ownership and cash holdings to be negatively correlated because cash is spent on value maximizing investments or distribution of dividends, rather than being accumulated internally. In the literature, this is referred to as the incentive alignment effect.

In contrast to the pure incentive alignment effect, and as evident from Ozkan and Ozkan's (2004) study of UK firms, the relationship between managerial ownership and cash holdings can be non-monotonic. This means that whether the relationship is negative or positive depends on the current level of managerial ownership. Ozkan and Ozkan find that if the level of managerial ownership is low, the incentive alignment effect is valid. When the level of managerial ownership is already at a high level, they find that a further increase might result in more cash being held, i.e. a positive relationship. This is the entrenchment effect. One argument for this effect is that when managerial ownership is high, manager's ability to resist outside pressures increases, and hence, they hold more cash given that they follow their own self-interest (Ozkan and Ozkan, 2004; Morck, Shleifer and Vishny, 1998).

5. Possible Hypotheses

Based on the theories discussed, we propose the following possible hypotheses:

Incentive alignment effect:

- Hypothesis 1
 - We expect a *negative* relationship between managerial ownership and cash holdings (increased managerial ownership, less cash)

Managerial risk aversion effect:

- Hypothesis 2
 - We expect a *positive* relationship between managerial ownership and cash holdings (increased managerial ownership, more cash)

In addition to these two main hypotheses we will further look into the possibility of an entrenchment effect and thereby a non-linear relationship between managerial ownership and cash holdings. If we find such a relationship to be relevant in our defined case, we will construct a hypothesis and test the significance of the relationship.

Further, we are now also investigating the possibility of including hypotheses regarding the relationship between some of our control variables, managerial ownership, and cash holdings. Among other relationships, we are considering investigating the relationship between firm size, managerial ownership, and cash holdings. It might be the case that increased managerial ownership will have a larger impact on cash holdings in the smallest companies relative to the largest companies. It might also be the case that increased managerial ownership will have less impact on cash holdings in corporations with high growth opportunities given the possibility of better aligned interests between managers and shareholders.

6. Data

Data

For our empirical analysis we will use a sample of corporations listed at the Oslo Stock Exchange with data obtained from annual reports, the Centre for Corporate Governance Research at BI Norwegian Business School, Datastream, and the Oslo Stock Exchange.

Following the likes of Ozkan and Ozkan (2004) and La Porta, Silanes and Shleifer (1999), they argue that because ownership structure tends to be relatively stable over a certain period of time, we will only need to obtain such data for one year. Furthermore, the authors argue that using ownership data that does not all come from the same year will also not pose problems for the validity of the results.

Initially, our sample will consist of all firms with available cross-sectional data. Following Ozkan and Ozkan (2004), we will exclude firms that operate in the financial sector because of reasons such as their different requirements of cash holdings, e.g. to ensure liquidity. Next, we will drop missing firm-year observations to ensure validity. Finally, we exclude companies that were listed or delisted during the sample time period.

Proposed Variables

Below follows a list and brief explanations of the variables that we, at the time being, plan to include in our study.

The dependent variable:

- Cash holdings
 - Ratio of cash and cash equivalents to total assets

The independent variable:

- Managerial ownership (MAN)
 - Total percentage of equity ownership by company directors.

Control variables:

Our control variables refer to firm specific characteristics that in previous studies have explained corporate cash holdings (see Opler et al, 1999; Ozkan and Ozkan, 2004), so that we can test the relative impact of the independent variable as described above. We hope that by including these we will make our study more accurate. In our master thesis we will explain the variables in detail and investigate their relative impact on corporate cash holdings given our dataset. The control variables we propose include is:

- Cash Flow
 - Ratio of pre-tax profit plus depreciation to total assets
- Firm Size
 - Natural logarithm of total assets

- Leverage
 - Ratio of total debt to total assets (Tot. debt/tot. assets)
- Liquidity
 - Ratio of working capital (Assets-liabilities) less cash to total assets
- Growth opportunity proxy
 - Ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets (Market-to-book)
- Performance/Profitability
 - Return on assets (operating income/total assets) and/or Tobin's Q, EBITDA/Net sales
- Board size
 - Number of directors on the board
- Variability
 - Standard deviation of cash flows divided by the average total assets
- Dividend
 - Ratio of dividend payments to total assets
- Industry dummies
 - Dummies that enable us to account for the industry specific factors that affect cash holdings.

7. Methodology

Methodology

In order to investigate our research question we will apply a quantitative approach. This will allow us to run regressions and perform statistical test in order to investigate the hypothesised relationships. Statistical tests will tell us whether or not our results are significant at different levels.

Our quantitative approach will follow the methodology presented by Ozkan and Ozkan (2004), i.e. multiple cross-sectional regressions. This implies running regressions where the dependent variable (cash) is a function of the independent variable and the control variables, which, based on previous literature, is identified as determinants of cash holdings. For reasons as explained above, we will measure ownership variables in one year. For the control variables we plan to use the average values over several years to mitigate problems with extreme values. We plan to use the software program E-Views to conduct our analysis.

We will consider using other econometric methods. To decide on this matter we will conduct further research and testing of models, e.g. different variations of OLS, fixed effect regression, etc.

Modelling

To ensure that our results are robust, we plan to run several regressions with different specifications (models). The different specifications are yet to be established. However, three likely regressions that we will run are as described by Ozkan and Ozkan (2004, 2121). Another, perhaps more general possibility, is to define a model 1 that includes the dependent variable (cash) and the explanatory variables (ownership variables), excluding the control variables (i.e., firm size, leverage, etc.). Then, for model 2 we add one control variable, for model 3 we add another control variable and so on, until the final model includes all variables. Further research will provide the basis for how we will ultimately specify our model(s).

Statistical tests and validity of results

To ensure validity of our results we will perform several statistical tests. As mentioned, we will test different regression models to evaluate how they fit our data. In addition, we will test for heteroscedasticity, which if present, we must correct standard errors. Secondly, we will test for multicollinearity. There are various ways to do this, one being looking at the correlation matrix. Thirdly, we will test for normality. However, given that we use a large enough dataset, we should not exhibit problems of non-normality. Fourthly, given previous research we will likely have to adjust for large outliers. A common method to deal with this has been to winsorize the data. This involves setting an upper and lower bound value, which outliers outside either boundary will take. Another method is to trim the data.

8. References

- Bates, Thomas W., Kathleen M. Kahle, and Rene Stulz. 2009. "Why Do U.S. Firms Hold So Much More Cash than They Used To?" *Journal of Finance* 64: 1985-2021.
- Boubaker, Sabri, Imen Derouiche, and Duc Khuong Nguyen. 2013. "Does the Board of Directors Affect Cash Holdings? A Study of French Listed Firms". *Journal of Management and Governance* 19: 342-370.
- Chen, Yenn-Ru. 2008. "Corporate Governance and Cash Holdings: Listed New Economy versus Old Economy Firms". *Corporate Governance: An International Review* 16(5): 430-442.
- Dittmar, Amy, Jan Mahrt-Smith and Henri Servaes. 2003. "International Corporate Governance and Corporate Cash Holdings". *Journal of Financial and Quantitative Analysis* 38(1): 111-133.
- Fahlenbrach, Rüdiger and Rene Stulz. 2009. "Managerial ownership dynamics and firm value". *Journal of Financial Economics* 92 (3): 342-361.
- Harford, Jarrad. 1999. "Corporate cash reserves and acquisitions". *Journal of Finance* 54(6): 1969-1997.
- Isshaq, Zangina, Godfred A. Bopking and Joseph Mensah Onumah. 2009. "Corporate governance, ownership structure, cash holdings, and firm value on the Ghana Stock Exchange". *The Journal of Risk Finance* 10(5): 488-499.
- Jensen, Michael C. 1986. "Agency Costs of Free Cash Flow, Corporate Finance and Takeovers". *American Economic Review* 76(2): 323-329.
- Jensen, Michael C. and William H. Meckling. 1976. "Theory of the firm: Managerial Behaviour, Agency Costs and Ownership Structure". *Journal of Financial Economics* 1976 (3): 305-360.

Kalcheva, Ivalina and Karl V. Lins. 2007. "International Evidence on Cash Holdings and Expected Managerial Agency Problems". *The Review of Financial Studies* 20 (4): 1087-1112.

Kusnadi, Yuanto. 2003. "Corporate Cash Holdings, Board Structure, and Ownership Concentration: Evidence from Singapore". Hong Kong University of Science and Technology.

La Porta, Rafael, Florencio Lopez-de-Silanes and Andrei Shleifer. 1999. "Corporate Ownership Around the World". *Journal of Finance* 54(2): 471- 517.

Martínez-Sola, Cristina, Pedro J. García-Teruel, and Pedro Martínez-Solano. 2013. "Corporate cash holding and firm value". *Applied Economics* 45(2): 161-170.

Morck, Randall, Andrei Shleifer and Robert W. Vishny. 1988. "Management ownership and market valuation.". *Journal of Financial Economics* 20 (1988): 293-315.

Niskanen, Mervi and Tensie Steijvers. 2011. "Managerial ownership effects on cash holdings: The case of private family firms".

Opler, Tim, Lee Pinkowitz, Rene Stulz, and Rohan Williamson. 1999. "The determinants and implications of corporate cash holdings". *Journal of Financial Economics* 52: 3-46.

Ozkan, Aydin and Neslihan Ozkan. 2004. "Corporate cash holdings: An empirical investigation of UK companies". *Journal of Banking & Finance* (28): 2103-2134.