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VALUATION EFFECTS OF CORPORATE CASH HOLDINGS

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ABSTRACT

Corporate cash holdings have an important role in the financial management of corporations. Firms hold cash for various reasons, Keynes (1936) states the reasons to be of transaction, precautionary and speculative nature, respectively, and firms' cash policies differ both on an industry and firm level. Previous empirical studies mainly deal with the determinants and behavior of corporate cash holdings however, studies on the effects of corporate cash holdings on firm valuation are rare. Reimund/Schwetzler (2004) investigate the relationship between corporate cash holdings and excess valuation for firms on the German market by creating excess enterprise values of firms, adapting a valuation algorithm constructed by Berger/Ofek (1995). We apply a similar method for firms listed on the Swedish market (Affärsvärldens Generalindex, AFGX). We use two proxies for the optimal level of cash to sales: i) the industry median and ii) an average weighted by market capitalization. We find that the level of corporate cash holdings significantly affects firm valuation. Our results indicate that positive cash to sales deviations from both industry benchmarks has a positive effect on excess enterprise value. Negative cash to sales deviations have a negative effect on excess enterprise value, but only when using the weighted average as industry benchmark. Our results fail to support the joint hypothesis, in line with the trade-off theory, that any deviation in firms' cash to sales ratio relative an industry benchmark ought to have a negative effect on excess enterprise value. Overall, we conclude that firms should not overlook the level of cash holdings, due to significant effects on firm valuation. Thus, a firm's cash policy plays a role of importance in the shareholder value creation.

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CHAPTER 1

INTRODUCTION

In this introductory part we present the topic of our thesis and introduce the reader to the problem we pose in this paper. The purpose of the thesis is then stated and ending this chapter is an outline presenting the forthcoming structure of the thesis.

1.1 BACKGROUND

Determining the optimal level of cash holdings for a given firm is not something that easily can be done. It is not based on some more or less simple mathematical formula, there are no specific rights or wrongs when targeting the optimal level of cash holdings and it relies, at least to some extent, on industry specifics and firm characteristics. Simply put: different industries demand different levels of cash holdings in order to make operations run smoothly. Furthermore, firm characteristics such as growth opportunities and cash flow volatility affect what level of cash a firm would hold. What is essentially important for every firm in every industry is to identify the costs and benefits of holding certain amounts of cash and to act on it in a trade-off theory fashion.

The topic, corporate cash holdings, has been examined in various ways during the last decades in order to pinpoint the benefits and costs of holding cash and the forces behind such characteristics. A lot of the research in this area has its roots in the three typical motives supporting cash holdings, stated by Keynes (1936). According to Keynes, the motives behind holding cash are i) the transaction motive ii) the precautionary motive iii) the speculative motive. The transaction motive is to be interpreted as the possibility for a firm to bridge short term inflows and outflows of cash, the precautionary motive is obviously motivated by the firm being able to pay its future obligations while the speculative motive gives reason for economic players to speculate on rising interest rates. The cash holding dilemma bares conflicts of interests between shareholders and

management since there may be incentives for management to hold cash in a way that does not create value for the shareholder, or even worse destroys shareholder value. Holding excessive levels of cash may cause room for management to spend money on perks and hoarding cash may also give managers incentives to target a sub-optimal expansion of the firm which is a problem of overinvesting and empire building, typically not beneficial for the shareholder. Murphy (1985) finds that managers' compensation is positively correlated with the size of the firm. Also, firms tend to reward middle managers via promotions rather than year-to-year bonuses, which lead to incentives to make growth a priority in order to supply new positions within the firm (see Baker 1986). Again, it all comes down to costs and benefits of holding cash and the identification of these. In a strict theoretical environment where the argument of perfect capital markets holds, the problem of corporate cash holdings would never exist because raising funds immediately would be possible at no extra cost. However, in a real world setting where capital markets are imperfect, several reasons – including agency theory, information asymmetries, transaction costs and strategic flexibility – motivates holding or not holding cash.

The majority of the research made on corporate cash holdings focuses on investigating why firms hold cash, (see for example Baumol 1952; Almeida et al. 2002; Opler et al. 2001; Foley et al 2007), the determinants of cash holdings (see for example Kim et al. 1988; Opler et al. 1998) and recent years, effects of corporate governance has been taken into account when looking at corporate cash holdings (see for example Pinkowitz et al. 2006; 2007; Frésard/Salva 2010). Explanations for holding cash vary which make the topic especially intricate to investigate. Theory behind prior research and findings of these will be presented and discussed later in this thesis.

Although much work has been done, and with various approaches, on corporate cash holdings, valuation effects have not, with a few exceptions, been studied (see for example (Reimund/Schwetzler 2004; Pinkowitz et al. 2006).

1.2 PROBLEM DISCUSSION

Does the level of corporate cash holdings affect the value of the firm? Answering this question calls for an analysis in terms of costs and benefits of corporate cash holdings from a shareholder's perspective. A number of studies discuss such costs and benefits but very limited research has been made on the valuation effects of corporate cash holdings, thus there is little empirical evidence on the topic. Opler et al. (1999) present indirect evidence of firms using excess cash in order to finance operating cash flow shortfalls; Harford (1999) examines the acquisition behavior of cash-rich firms and finds that these acquisitions are on average value destroying. As mentioned above, a lot of research has been done in the area of corporate cash holdings which makes the topic suited for further elaboration. Determinants for cash holdings and the drivers of demand for cash for a firm is widely investigated but research on at least one important and interesting matter lacks sufficient research coverage. In the basic idea and theoretical assumption of firms (or rather firms' management) trying to maximize shareholder value (value maximization) the effect of corporate cash holdings on firm value would constitute a deeply motivating research topic. The practical drive for conducting this study could be considered to be twofold. Primarily, from a management perspective where a firms' management would try to optimize cash balance in order to maximize value. Secondarily from a trading perspective where traders could trade on over- or undervalued firms with respect to cash holdings. Given this, results may help management and traders in their decision-making regarding the cash balance of the firm and their trading strategy, respectively.

In their paper from 2004, Reimund/Schwetzler investigate the cash effects on German firms' operating performance and valuation. We intend to focus on the valuation part of their paper by replicating their study and applying it to firms listed on the Swedish stock market where a model with the enterprise value to sales multiple is used as the dependent variable and constitutes a proxy for over- or undervaluation of any given firm. In order to make results more dimensioned the study is performed on an all firms basis as well as on a sector basis since different industries are exposed to different market factors. What sector's firm values could potentially be most affected by cash holdings and is any sector's firm values independent of cash holdings? Spotting differences sector-wise and reasons behind any dissimilarity will enhance the understanding of

how firms, depending on sector, functions. Summing up, is there a relation between the level of cash to sales and any relative over- or undervaluation of a firm compared to its industry?

1.3 PURPOSE

The purpose of our thesis is to determine if the level of corporate cash holdings relative to sales explains any, on an all firms basis and sector-wise, firm over- or undervaluation. There is little empirical evidence on valuation effects caused by the level of cash held by a firm and to this date there are, to our knowledge, no studies on the matter regarding firms on the Swedish stock market.

1.4 LIMITATIONS

This study is limited to investigating non-financial firms included in AFGX during the period 1996-2010. Financials are excluded mainly due to their vast difference in terms of capital structure and the capital requirements affecting banks and financial institutions. Firms with a fiscal year not ending December 31st, are also excluded and a small number of firms are excluded due to the lack of data. The choice of period is set in order to capture both market upswings and downturns. For a more elaborate discussion regarding our data and method of choice please see chapter 3.

1.5 THESIS OUTLINE

CHAPTER 2 – THEORETICAL FRAMEWORK

This section deals with the theory behind corporate cash holdings, why firms hold cash and the conflicts of interest caused by doing so. The costs and benefits of holding cash and ways to mitigate any potential problems are discussed. Key theoretical concepts such as agency theory, information asymmetries, transaction costs and strategic flexibility are considered and empirical evidence presented. Some fundamental theory on corporate valuation is also dealt with.

CHAPTER 3 – METHODOLOGY

In this chapter we explain how and what data that is collected and how it is processed. The model created for running regressions is presented and our variables of choice are motivated and discussed. Additionally, a discussion on the validity and the reliability of the method is held and argued for. The chapter also contains our procedure related to diagnostic testing.

CHAPTER 4 – RESULTS

In chapter four we present the outcome of our empirical testing. Regression results on the cash to sales variables are described on an all firms basis as well as sector-wise. On an aggregate level, we convey the regression results on the control variables in the models and comment on its behavior.

CHAPTER 5 – ANALYSIS

Chapter five contains a thorough analysis of the results presented in chapter four. The analysis includes possible explanations for the outcome of our empirical testing and we put the results in a theoretical perspective as well as comparing our results with previous relevant studies.

CHAPTER 6 – CONCLUSIONS

The last chapter contains our concluding remarks. Here we provide insightful thoughts on the results achieved and possible implications of our thesis outcome, as well as putting our final analytical remarks together.

CHAPTER 2

THEORETICAL FRAMEWORK

In this chapter we discuss previous research concerning corporate cash holdings and empirical evidence on the topic. The section includes both fundamental theory regarding the trade-off between holding versus not holding cash and empirical studies performed prior to our thesis. A perspective supporting the link between corporate cash holdings and firm valuation is taken.

2.1 FUNDAMENTAL THEORY

In a world where the assumption of perfect capital markets hold, described by Modigliani and Miller, it is completely irrelevant for firms to hold liquid assets. If a firm would face problems with liquidity, e.g. due to unexpectedly low cash flows, it is possible to raise capital immediately at no extra cost. Given this, there is no value created by holding cash, simply because it is equally valuable to raise capital by issuing equity or debt. Thus, the present value of one dollar is just one dollar. By relaxing the assumption of perfect capital markets, in order to establish a more realistic environment, we can apply more rational explanations as to why firms hold cash. To simplify, one can make the analogy between cash and inventory where cash functions in a similar way, matching cash inflows and cash outflows in the same manner as firms hold inventory to match the level of produced goods with the demand for these. Holding cash as well as holding inventory is a way for firms to hedge themselves against uncertainties regarding inflows and outflows of cash and future demand of produced goods, respectively. Given this, it would be costly for firms to hold either too much or too little cash, which implies that value maximizing firms will strive to hold liquid funds such that the marginal cost and marginal benefit of holding an extra dollar of cash is equal.

By holding cash, firms can avoid the cost of raising capital when in need of liquidity, but by holding cash firms may see higher returns on investments foregone. These are the main opposing features of corporate cash holdings and have its roots in the work by Keynes (1936) who stated three explanations as to why economic players would hold cash. The first motive is called the transaction motive which is derived from the problem described above (matching inflows and outflows). Secondly, firms hold cash in a precautionary manner in order to avoid ending up with liquidity problems, unable to pay its obligations, e.g. interest payments and bank loans that comes due. Thirdly, economic players may hold cash in a speculative motive, speculating on future higher interest rates. Opler et al. (2001) defines a firm to be short of liquid assets if it has to cut back on investments, cut dividends, or raise funds by selling securities or assets. We deal with five main explanations (also described in Reimund/Schwetzler 2004), linked to corporate cash holdings, on which prior research has been focused, and below these are discussed accompanied with relevant empirical studies.

2.1.1 TRANSACTION COSTS

When firms, in order to finance projects, raise funds in capital markets (i.e. debt or equity capital markets) they have to pay a fee, typically to investment banks carrying out the deal, to realize the issue. Thus, raising capital in this way comes with transaction costs. By using internal funds, such as firms' cash position or other positions of high liquidity, firms can reduce their exposure to transaction costs. Intuitively, the higher the expected transaction costs are, the higher a given firm's cash position would be. This reasoning is also possible to apply to asset fire sales where firms, in the absence of access to capital markets, have to sell off assets in order to complete its financing of a certain project. Although the definition of transaction costs is not a perfect fit when it comes to asset fire sales there are still, undisputedly, costs associated with this type of action. Pulvino (1998) investigates the airline industry and the relationship between the distressfulness of firms and at what discount they have to sell off assets in order to gain liquid funds. He finds that financially constrained firms receive lower prices than their less constrained competitors when selling used aircrafts. Thus, this study is supportive of holding cash in order to avoid costs associated with gathering liquidity.

Asset fire sales are especially costly for firms that tries to sell highly specialized assets (i.e. highly illiquid assets) due to the fact that the demand of firm specific assets are very limited and the selling firm is therefore forced to sell the asset at a large discount. Schleifer/Vishny (1992) find that liquid assets can be used to prevent asset fire sales of highly illiquid and specialized assets. Intuitively, firms with a higher level of asset specificity would hold higher levels of liquid funds in order to reduce the risk of being forced to fire sale their more specialized assets. Andrade/Kaplan (1997) studies highly leveraged transactions (HLTs) that subsequently became financially distressed. They find evidence of unexpected cuts in capital expenditures, undesired asset sales, and costly managerial delay in restructurings to be greatly concentrated in the period after the firm becomes distressed but before it files for Chapter 11. Opler/Titman find, in their study from 1994, that highly leveraged firms lose substantial market share to their more conservatively financed rivals in industry downturns. This evidence suggests that highly leveraged firms would hold higher levels of liquidity in order to cope with their aggressive capital structure. Transaction costs when issuing securities, costs associated with asset fire sales and distress costs – all supportive of cash holdings – are costly to the firm's shareholders.

2.1.2 INFORMATION ASYMMETRIES

External financing may also be costly due to information asymmetries, where company insiders have better knowledge of the intrinsic value of the firm than company outsiders. Assuming that firm managers are acting in the shareholders best interest and thus trying to maximize firm value, managers will attempt to time equity issues when the stock is overvalued (i.e. the stock is valued above management's perception of the intrinsic value of the stock). As company outsiders anticipate this strategy or behavior they discount the equity which leads to additional costs for the firm due to adverse selection (see Myers/Majluf 1984). As a consequence, this may lead to a problem of underinvestment as management choose not to raise external financing, and thus passing up on profitable investments because of these additional costs related to adverse selection. The same reasoning holds for risky debt; Stiglitz/Weiss (1981) show that credit rationing is caused by information asymmetries which would lead firms to lean on internally generated funds (idle cash) when investing in projects. For firms with a lot of investment opportunities, deadweight costs are especially costly, which makes the present value of one dollar

of cash saved higher than one dollar (see Faulkender/Wang 2006). Drobetz et al. (2010) analyzes a large international sample and find results indicating that the value of corporate cash holdings is lower in states with a higher degree of information asymmetry. Similar to transaction costs, firms or rather their management may find external financing too expensive giving them incentive to hold liquid assets. This is in line with the idea of a pecking order when firms choose the source of capital to finance a project with, which suggests that firms firstly finance its projects with internal funds rather than external equivalents.

2.1.3 STRATEGIC MOTIVES

For strategic motives firms may choose to hold a certain amount of cash. By holding a buffer of cash, industry incumbents may prevent new entrants to the market. Telser (1966) thought of it as having a "long purse" and argues for it in the following sense: "The entrant typically has a more stretched financial position when he tries to enter the market and by having a "deep pocket" the incumbent can engage in predatory practices to exhaust the entrant financially and drive him out of the market". Baskin (1987) finds similar results; he shows that cash or cash equivalents are held strategically in product markets that are imperfect to signal power and the possibility to take measures against new competitors. Further, a firm can choose to hold more cash than its rivals in order to more quickly exercise growth opportunities, especially if these growth opportunities only can be exercised once and by one player. Myers/Rajan (1998) focuses on what they call "the dark side of liquidity" and argue that greater asset liquidity reduces a firm's ability to commit to a certain strategy.

2.1.4 AGENCY COSTS

The possibility of conflict between a company's management and its shareholders may give rise to agency costs which also may contribute to the level of corporate cash holdings within a firm. The management of a firm may not always act in the shareholders best interest, simply because managers may be better off and gain personally by taking actions that does not maximize firm value (Jensen 1986). A firm's liquid assets are in reality more or less equivalent to its free cash flow and by using this more easily accessed source of capital, investments in projects that

otherwise would have been ruled out in the presence of market discipline, would be allowed. A problem of conflict causing agency costs is that company outsiders cannot distinguish if an investment in a project is value-adding or if the investment is made solely in the personal interest of managers. This problem is another example as to why raising external funds in the capital markets is more costly for the firm than to finance projects with internal funds. Key parameters for determining how large this deadweight cost is, are to what degree the management is entrenched and how effective the market discipline is.

Kim et al. (1998) investigate a large panel of U.S. industrial firms by modeling the firms' decision to invest in liquid assets when external financing is costly and find the optimal investment in liquidity to be increasing in the cost of external financing. Harford (1999) finds evidence that is supportive of agency cost theory when it comes to the free cash flow explanation. He finds that cash-rich firms engage in value destroying takeover activities, where the cash-rich bidder on average destroys seven cents of value per dollar spent, closing an acquisition. Pinkowitz (2000) investigates hostile takeover activity during the years 1985-1994 and finds the probability for a firm to be acquired, that has excess cash and is poor on investment opportunities, to decrease in their cash holdings, which is contradictory to what Pinkowitz labels as "conventional wisdom". Thus, this study implies that holding excess cash could be a sort of takeover defense. Myers/Rajan (1998) points out that holding too much cash leads to making bad acquisitions or investments and that potential conflicts between managers and shareholders increases in greater asset liquidity.

Moreover, holding excessive cash may prohibit the closing or downsizing of unprofitable business segments within a company. The reasoning behind this is that the excess cash serves as a buffer for operating losses. Opler et al. (1999) investigates publicly traded U.S. firms between years 1971-1994 by examining their cash holdings and marketable securities. They find that the main explanation to why firms hold excess cash is to balance variations in operating cash flows. Furthermore, they find little evidence that investments and acquisition spending is largely affected by excessive cash holdings which is somewhat contradictory to what Myers/Rajan (1998) find. Another study (Dittmar et al. 2002) investigates the agency theory in terms of shareholder rights and the variation of these across countries. They find evidence supporting the

theory that the degree of shareholder rights explains variations across countries in terms of corporate cash holdings and that the level of liquid funds or liquid assets is higher in countries with lower shareholder rights.

2.1.5 TAXES

Swedish firms are taxed on interest income earned by holding cash. Intuitively, this would trigger management to hold less liquid funds in order to reduce taxation. If firms would, instead of holding cash - receiving interest income - pay out any excess cash to shareholders in the form of dividends, shareholders would however be obliged to pay a tax on their dividend. These effects work in opposite directions. However, this situation would not occur if firms find other ways to distribute this amount to shareholders – buybacks for example. Foley et al. (2007) investigates U.S. multinational firms and find evidence that these firms hold cash in their foreign subsidiaries due to the tax costs associated with repatriating foreign income.

2.2 INTEGRATING MULTIPLE EFFECTS

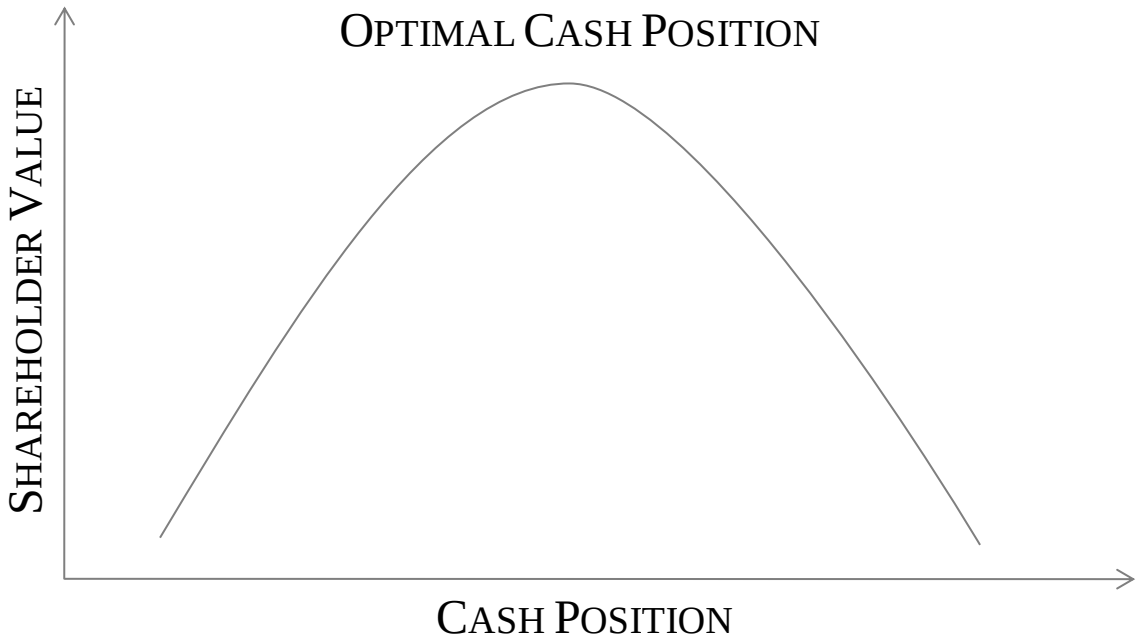
Many studies focus on one specific effect of corporate cash holdings. Only a few of the empirical studies that has been done actually integrate more than one cost or benefit of holding cash. Mikkelson/Partch (2003) test the argument of a conservative financial policy being run in the interest of the management of the firm rather than in the interest of the firm's shareholders. They examine the operating performance and other characteristics of firms that have held more than one fourth of their asset value in cash or cash equivalents during a five-year period and find these high cash firms' operating performance to have been comparable to or higher than firms in the same industry or of the same size. Interestingly, they find that high cash firms have higher investment activity, especially when it comes to investments associated with research and development, and have higher growth in asset value. Cossin/Hricko (2004) proposes a model where a real options approach is taken to determine the financial benefits of holding liquid funds. They measure these benefits if raising funds in capital markets is costly, if the firm faces the risk of the issued securities being underpriced and if the issue takes time to carry through. Kim et al. (1998) finds that the optimal level of corporate cash holdings is determined by the trade-off

between the low return received by the liquid funds held and the benefit of minimizing the need for raising costly external financing. The model they are using predicts that the optimal level of cash holdings is a function of i) the variance of future cash flows ii) the return of future investment opportunities iii) the cost of external financing and iv) the difference in return received from the firm's tangible assets and the firm's liquid assets. The optimal level of cash holdings increases in i)-iii) and decreases in iv).

Almeida et al. (2002) provides evidence on corporate cash policies by separating a large sample of U.S. manufacturing firms into financially unconstrained firms and financially constrained firms, respectively. The theory they propose assume that financially unconstrained firms can undertake any positive NPV project and that their cash position therefore is irrelevant while the financially constrained firm, which have difficulties raising external capital, have an optimal cash position in order for them to have funds available to undertake any positive NPV project. The optimal cash position, applicable to the financially constrained firm, is determined by the value of today's investments relative to the expected value of any future investment. The empirical findings indicate that financially constrained firms tend to save a positive fraction of their cash flows while firms classified as financially unconstrained do not and that the cash flow savings of financially constrained firms are higher in recessions. Thus, Almeida et al. provide a comprehensive model describing the drivers of firms' cash position. This study lays ground for the impact of financial constraints on the concept of an optimal cash position. As financially constrained firms rely, to a greater extent, on internally generated funds, the cash flows of a financially constrained firm mainly determine the possibility of undertaking new investments. Measuring constraints by the cost of external financing raises the question of what the relationship (monotonic, exponential etc.) between the cost of external financing and investments looks like. Povel/Raith (2002) find that for firms with a negative cash position, investments decrease as more internal funds become available, the exact characteristic of the relationship is however undetermined.

With the intention of getting some structure of the theoretical framework of cash holdings and the empirical findings generated by research we basically have two contradicting approaches at hand. Firstly, the view of an existing optimal cash position. The theory is in general a typical trade-off

based theory where the shareholder value is maximized with respect to the firm's cash position. Any deviation from this optimum would, ceteris paribus, decrease shareholder value (see graph 1). From basic micro economics the optimum is found where the marginal cost and the marginal benefit (of holding cash in this case) are equal. This is in line with what Opler et al. (1999) propose. Secondly, the pecking order theory (Myers 1984) suggests that there is no optimal level of corporate cash holdings. Firms avoid using external financing due to the associated costs that comes with raising capital externally e.g. agency costs and costs associated with information asymmetries. The level of cash holdings would rather reflect the degree of investment opportunities within a firm. This also underpins the idea of firms retaining a portion of their free cash flow in order to finance new projects and as an act of caution in the event of negative cash flows.



Graph 1: Pictures the theory of an optimal cash position which corresponds to the point where shareholder value is maximized.

Reimund/Schwetzler (2004) studies the valuation effects of corporate cash holdings on firms listed on the German stock market. They apply a similar valuation algorithm as introduced by Berger/Ofek (1995) and model the valuation effects of corporate cash holdings on excess enterprise values of firms. Evidence from the study indicates that deviations from the industry

cash to sales median have a significant impact on excess enterprise value. They find that negative deviations have a negative impact on excess valuation while positive deviations have a positive impact on excess valuation. This implies that the market tend to value firms with a cash to sales ratio above industry median, at a premium. Thus, the joint hypothesis proposed by Reimund/Schwetzler, suggesting that both negative and positive deviations from the industry cash to sales median should render a negative impact on excess value, differs partly with their empirical findings.

CHAPTER 3

METHODOLOGY

This part of the thesis involves a detailed description of the employed research method. The chapter gives an extensive explanation of the variables used and from what data source they were collected. The chapter ends with a discussion concerning the methodological problems, including the validity and reliability, of our study.

3.1 RESEARCH APPROACH

Our aim with this thesis is to empirically test the relationship between corporate cash holdings and excess firm valuation for firms listed on the Swedish market. In order to describe this relationship we apply a panel data regression model previously used by Reimund/Schwetzler (2004). In particular we want to investigate if positive and negative deviations from the industry benchmark cash to sales ratio affect real assets' excess values.

3.2 SOURCES OF DATA

We use Thomson Reuters Datastream (Datastream) as our main data provider which, after cross checking samples, we consider to be valid (see section 3.6.1 for cross checking procedure). Starting from all available firms on AFGX consisting of 249 firms, we exclude financial services and banking due to the nature of their operations. From the remaining 208 firms, an additional eight firms are excluded due to lack of financial data which means a not fully reported year with regard to our variables in the regression. Finally 18 firms, for which the fiscal year does not end on December 31st, are excluded in order to increase comparability between the remaining firms in the sample. Including these firms in the sample could give significant errors in the data due to the fact that we would have to interpolate annual reports data in order to forecast the rest of the year and ultimately have a sample with firms reporting December 31st. The resulting sample includes

182 firms listed on AFGX and a total of 2,730 firm years. The sample length is, when applicable, 1996-2010. This sample length includes both upswings and downturns in the economy and we believe that it can be considered sufficient in capturing different states in the economy. Additional information has been gathered using various article search engines such as; Lund University's article database (LIBHUB), SSRN and JSTOR.

The sample is divided into eight different sectors based on Nasdaq OMX Stockholm's own classifications. They define ten different sectors of which financials are excluded from our study. We further combine the sectors Energy and Utilities to gain a sufficient number of companies to include in a panel data regression. Merging these two sectors seems reasonable considering that the two companies, Arise Windpower and Etrion Corporation, which constitutes the Utilities-sector, are renewable energy producers. The eight sectors relevant for our study are presented in table 1.

Industry	Number of firms
Energy and Utilities	5
Materials	9
Industrials	62
Consumer Discretionary	24
Consumer Staples	9
Health Care	24
Information Technology	44
Telecommunication Services	5

Table 1: Represent the sectors included in the study. The sectors energy and utilities are two separate sectors combined. Sector definitions come from Nasdaq OMX.

Data downloaded from Datastream is in raw-data form, straight from individual corporations' annual reports. All transformations of the raw data are then calculated by us. For a more intricate description of the variables collected and transformations made, see table 2**.**

3.3 VARIABLES

Reimund/Schwetzler (2004) uses an adaptation of the valuation algorithm from Berger/Ofek (1995), where the regressand is defined as a relative excess value of a company's real assets. Using the data series enterprise value to sales we can, adapting the similar valuation algorithm as

Berger/Ofek (1995), calculate excess enterprise values. Starting from the raw-data series enterprise value to sales, we calculate the median ratio for each industry, each year. This calculated median is then multiplied by each firm's net sales the corresponding year to create an imputed enterprise value. The logarithm of the ratio of actual enterprise value and imputed enterprise value, is what Reimund/Schwetzler (2004) define as a relative excess value for each firm. The relative excess value reflects an over- or undervaluation of the firm's real assets relative to the valuation of its industry peers.

The next step involves determining which variables that can explain the over- or undervaluation in a panel regression. Berger/Ofek (1995) use investments and cash flow as a proxy for the growth perspectives and current profitability. Adding these variables is appropriate considering that they are defined as value drivers and arguably affect company valuation.[1] Apart from a hypothesized effect on excess values, capital expenditures and cash flow would serve a purpose as basic control variables with an expected positive impact on valuation, in line with corporate financial theory. Market capitalization serves as a proxy for the firm's access to external financing in capital markets as well as for economies of scale in cash management. To capture the effect that capital structure has on excess values we add leverage to the regression equation.

However lastly, since we want to study the impact of corporate cash holdings on excess values, we need to add a variable that captures this specific effect. It is calculated in three steps. First, we calculate cash to sales ratios for every firm in our sample. Then we derive the industry median cash to sales ratio, used as a benchmark, for each given year and industry. The final step is to take the logarithm of the cash to sales ratio for firm *j* in industry *k*, divided by the cash to sales ratio median in industry *k*. The series will tell us if companies hold more or less cash than the industry median, resulting in a negative value if the companies hold less cash than the industry median and vice versa. However, it is not yet ready to be used as a variable in our model. We want to analyze positive and negative deviations from the industry median separately; hence we create dummy variables that capture the effects separately. We define the dummy variables similar to Reimund/Schwetzler (2004):

[1] Koller, T./Goedhart, M./Wessels, D. (2010): Valuation: Measuring and Managing the Value of Companies (5th edition), Wiley, p. 17.

D1 = 1 if the cash to sales ratio of firm *j* in industry *k* is higher than the industry median cash to sales benchmark, $CS_{j,k} > CS_k^*$

D1 = 0 if the cash to sales ratio of firm *j* in industry *k* is lower than the industry median cash to sales benchmark, $CS_{j,k} < CS_k^*$

D2 = 1 if the cash to sales ratio of firm *j* in industry *k* is lower than the industry median cash to sales benchmark, $CS_{j,k} < CS_k^*$

D2 = 0 if the cash to sales ratio of firm *j* in industry *k* is higher than the industry median cash to sales benchmark, $CS_{j,k} > CS_k^*$

By taking the logarithm of the ratio of the firms to the industry cash to sales ratio, we can easily determine positive from negative effects since taking a logarithm of a quotient below one is negative i.e. when we have a negative deviation from the industry benchmark. We multiply the dummy variables with the logarithmic cash to sales series to create our regression variables that captures both negative and positive deviation from the industry benchmark. The dummy variables function for each observation i.e. each year.

$$\Delta CS^{+} = D1 \cdot \ln\left[\frac{CS_{j,k}}{CS_k^*}\right]$$

$$\Delta CS^{-} = D2 \cdot \ln\left[\frac{CS_{j,k}}{CS_k^*}\right]$$

Table 2 present the variables used in the final regression, which is presented in chapter three, section five.

Variable	Definition
CAPITAL EXPENDITURES	Represent funds used to acquire fixed assets other than those associated with acquisitions.
CASH & SHORT TERM INVESTMENTS	Includes cash and short term investments such as marketable securities.
ENTERPRISE VALUE	Market capitalization at year end + preferred stock + minority interest + total debt - cash & short term investments
MARKET CAPITALIZATION	Market price-year end * common shares outstanding
NET DEBT	Total debt - cash & short term investments
NET SALES OR REVENUES	Gross sales and other operating revenue - discounts, returns and allowances
TOTAL ASSETS	Balance sheet item
CASH FLOW/SALES	Funds from operations / Net sales or revenues * 100
LEVERAGE	Net debt / Total assets
CASH FLOW	(Cash flow / Sales) / 100 * Net sales or revenues
EV/SALES	Enterprise value / Net sales or revenues
IMPUTED EV	Industry median Ev / Sales * Net sales or revenues
$LN(EV_a / EV_i)$	LN(Enterprise value / Imputed Ev)
CASH/SALES	Cash & short term investments / Net sales or revenues
$LN(CS_j / CS_k)$	LN((Cash / Sales) / Industry median (Cash / Sales))

Table 2: Represent the variables employed in the study, either in itself or transformed. A definition follow each variable to show how it has been collected and facilitate replication.

3.4 DIAGNOSTIC TESTING

Before creating the regression model, we conduct a series of diagnostic tests to insure that the input variables are robust and would not create difficulties when making inferences. All variables are tested for a unit root using both a Phillips-Perron and an Augmented Dickey-Fuller test throughout the panel. The tests significantly indicate that the variables do not contain a unit root.

Capital expenditures and market capitalization are found to be relatively highly correlated. An implicit assumption when using an OLS estimator is that the explanatory variables are not correlated with one another. However, if the explanatory variables are not orthogonal, a problem occurs which is defined as multicollinearity. Near multicollinearity arise from a high, but not perfect relationship, between two or more of the variables. As long as it is not perfect multicollinearity, it does not violate the OLS assumptions. It is still unbiased and BLUE (Best Linear Unbiased Estimator). However, even though the OLS assumptions are not violated, the greater the multicollinearity, the greater the standard errors. This means that the confidence intervals for coefficients will be very wide and t-statistics small, making it harder to reject the null i.e. establish statistical significance.

Previous research by Reimund/Schwetzler (2004) includes market capitalization and capital expenditures as control variables, with hypothesized signs according to economic theory. Considering the difficulty to discern the exact source of the multicollinearity, besides looking at a correlation matrix, we feel that dropping a variable, which is an ad hoc method of dealing with multicollinearity, is not a viable option. Reimund/Schwetzler's reasoning when including market capitalization and capital expenditures also rejects the method of creating a ratio of the correlated variables. Ultimately, the decision comes down to ignoring it or increasing the sample size. Considering that, despite ignoring it, the OLS estimator is still BLUE and that the sample already contains 1860 observations, ignoring it seems to be the most viable option for our research. Using both cross-sectional and times series dimensions can be a remedy for multicollinearity[2], making us more comfortable in our decision to ignore the high correlation.

3.5 MODELLING APPROACH

From our defined variable series we have created the following regression model:

$$EXV_{jkt} = \alpha + \beta_1 \cdot CF_{jt} + \beta_2 \cdot Size_{jt} + \beta_3 \cdot Capex_{jt} + \beta_4 \cdot Leverage_{jt} + \beta_5 \cdot \Delta CS^{+} + \beta_6 \cdot \Delta CS^{-} + \varepsilon_{it}$$

Where EXV_{jkt} is the excess valuation of firm *j*'s real assets in industry *k* at time *t*, CF_{jt} is the cash flow for firm *j* at time *t*, $Size_{jt}$ is defined as the ratio market capitalization to sales for firm *j* at time *t*, $Capex_{jt}$ is defined as the ratio capital expenditures to sales for firm *j* at time *t*, $Leverage_{jt}$ is defined as net debt divided by total assets for firm *j* at time *t*, finally ΔCS^{+} and ΔCS^{-} is the positive and negative deviation of the ratio of the firms to the industry cash to sales ratio. One could look at the resulting regression coefficients as estimates for the elasticity of excess value with regard to the cash to sales ratio on an industry level. Similar to Reimund/Schwetzler (2004), we make the assumption that the industry median cash to sales ratio is a good proxy for the optimal cash holdings of all firms in the industry. Firms with unreported financial information e.g. firms listed after 1996, create gaps in our model and is therefore removed from the regressions the affected year. This is called an unbalanced panel, with some cross-sections

[2] Brooks, C. (2008): Introductory Econometrics for Finance (2nd edition), Cambridge, p. 174

containing more observations than others across the same sample length. Panel regressions in Eviews 7 correct for this automatically by removing the incomplete observations.

To make further contribution to previous research we include a similar panel regression to the one previously mentioned, with the only difference being that we substitute the industry median cash to sales for a weighted average based on market capitalization. One could argue that a larger corporation is a better proxy for the optimal cash to sales ratio and should have a more significant contribution to the benchmark used in the regression. Thus we need to redefine our ΔCS-series to acknowledge this new benchmark:

$$\Delta CS^{+}_{AVG} = D1 \cdot \ln\left[\frac{CS_{j,k}}{CS^{*}_{AVG,k}}\right]$$

$$\Delta CS^{-}_{AVG} = D2 \cdot \ln\left[\frac{CS_{j,k}}{CS^{*}_{AVG,k}}\right]$$

$$CS^{*}_{AVG,k} = \sum w_{jkt} \cdot CS_{jkt}$$

$$\text{s.t} \sum w_{jkt} = 1$$

Where w_{jkt} is defined as market capitalization for firm *j* in industry *k* at time *t*, divided by the total market capitalization for industry *k* at time *t*. The weighted average is corrected for extreme values by removing all cash to sales ratios above two from the sample, effectively removing 127 observations. When applying this new benchmark to our previous regression model we obtain the following regression:

$$EXV_{jkt} = \alpha + \beta_1 \cdot CF_{jt} + \beta_2 \cdot Size_{jt} + \beta_3 \cdot Capex_{jt} + \beta_4 \cdot Leverage_{jt} + \beta_5 \cdot \Delta CS^{+}_{AVG} + \beta_6 \cdot \Delta CS^{-}_{AVG} + \varepsilon_{it}$$

Making the same assumption as Reimund/Schwetzler (2004), the industry benchmark cash to sales is used as a proxy for optimal cash holdings in a given industry. Following the trade-off

theory, we hypothesize that deviations from the optimal level of cash holdings, be it positive or negative, should result in a lower excess value i.e. have a negative effect. Given that the variables are a natural logarithm of a ratio, any ratio below one will become negative per definition and thus we expect the coefficient estimate for ΔCS^- to be positive. Ratios above one will remain positive after taking the natural logarithm and thus we expect the coefficient for ΔCS^+ to be negative. The control variables cash flow and capital expenditures are a proxy of profitability and growth opportunities, following the methodology of Reimund/Schwetzler (2004), and should yield a positive coefficient. As mentioned in section 3.3, market capitalization serves as a proxy for firms' access to capital markets. Due to this we would expect a larger corporation to have greater access to capital markets and thus a positive coefficient in the regression. We expect the leverage coefficient to be positive, due to firm's better utilizing tax shields from increased debt. In line with the concept of asset substitution and risk shifting, where shareholders are the only party benefiting (as opposed to debt holders) from increased leverage.

3.6 METHODOLOGICAL PROBLEMS

When conducting research it is important to evaluate the method used, so that the results can contribute credibly to further development within the research field. There are two main aspects to consider when evaluating the method of choice. Firstly, to make certain that the method measures what it is supposed to measure, something referred to as validity. Secondly, to evaluate the ability of the method providing trustworthy and reliable results from the data input, defined as reliability.[3] These are essential prerequisites for a hypothesis to establish itself as an accepted scientific truth.

3.6.1 VALIDITY

To ensure high validity in the study, rigorous cross-checks have been conducted on the data collected from Datastream. Using a statistical sample size calculator[4], we find that a sample size of 378 observations would sufficiently ensure that the data collected is valid on a 95 percent

[3] Saunders, M./Lewis, P./Thornhill, A (2009): Research Methods for Business Students (5th edition), Prentice Hall, pp. 156 – 157.
[4] The sample size is calculated using a sample size calculator provided by Raosoft, www.raosoft.com.

confidence level with a five percent margin of error. Eight different data series have been collected from Datastream to be included in the regression, thus we need roughly 48 observations per series to ensure validity. To avoid selection bias, we used a random number generator in MS Excel to obtain the eight sample series. The observations in the sample series were then cross-checked with the corresponding annual report. No errors in the data collected was found, thus we consider the data to be valid. The regressions used, are versions previously created and tested by Reimund/Schwetzler (2004), and are therefore considered to be valid.

3.6.2 RELIABILITY

All regressions are estimated using least squares with fixed effects, both cross-sectional and period, as the sample effectively constitutes the entire population i.e. all the stocks traded on an exchange.[5] We conduct a test called "redundant fixed effects" to make sure that this assumption is valid, and find that it is the correct model for all industries. A Jarque-Bera test reveals that the standard errors in the regressions are not normally distributed for all industries. To minimize the effect of non-normality we run the regressions, where the Jarque-Bera test rejects the null of normality, with "Cross-section SUR Standard errors & Covariance"[6]. They are defined as panel corrected standard errors that allow for contemporaneous correlation and heteroscedasticity. An alternative method would be to model the data with a different model than OLS, which does not assume normality. However, Brooks (2008) states that for sufficiently large samples, "violation of the normality assumption is virtually inconsequential"[7], thus we use OLS regressions throughout the sample.

[5] Brooks, C. (2008): Introductory Econometrics for Finance (2nd edition), Cambridge, p. 500
[6] Eviews 7: Users Guide Part II, HIS, p. 612
[7] Brooks, C. (2008): Introductory Econometrics for Finance (2nd edition), Cambridge, p. 164

CHAPTER 4

RESULTS

This chapter presents our obtained regression results. In a systematic fashion the results are presented, beginning with the cash related variables for the whole sample as well as sector-wise and ending with the regression output for all firms. Furthermore, the estimated coefficients' impact on excess valuation is discussed. This to give the reader a clear view of what each model provide towards our main hypothesis.

4.1 REGRESSION RESULTS

Overall we find no evidence supporting the joint hypothesis that any form of deviation from an industry benchmark should have a negative effect on valuation. In fact we find significant evidence that positive deviation from the industry yield a higher excess value, clearly contradicting our initial expectations. The materials sector is the odd one out when looking at the negative deviation. Apart from that sector, we find evidence that lower cash holding than an industry benchmark yields a lower excess value, thus supporting our hypothesis. When looking at the whole sample, the weighted average benchmark yields strong significance for both deviation variables. The coefficient for the negative deviation is significant on a 1% level and has the hypothesized sign. The coefficient for positive deviation is significant on a 0.1% level, though it does not yield the hypothesized negative sign. With the industry median cash to sales as benchmark in the sample, we lose significance on the negative deviations; however the significant positive coefficient remains for positive deviation. The adjusted R^2 for the regressions including the whole sample is a more than satisfying 78.47% and 70.03% respectively for the median and weighted average benchmark. Tables 3 and 4 present summarized regression results for our main variable of concern: the cash to sales deviation.

Industry-specific analysis: Median benchmark

Subsample		ΔCS+	ΔCS-	Median cash to sales	Observations
All firms	**Coefficient**	**0,7129*** **	**0,0189**	**0,0823**	**1860**
	p-value	**0,0000**	**0,3711**		
Consumer discretionary	Coefficient	0,4954***	0,0235	0,0582	208
	p-value	0,0004	0,7264		
Consumer staples	Coefficient	0,3891	0,2925*	0,1011	64
	p-value	0,0532	0,0397		
Energy Utilities	Coefficient	0,6009***	0,0949	0,2787	47
	p-value	0,0000	0,4093		
Health care	Coefficient	0,9618***	0,4626***	0,6268	229
	p-value	0,0000	0,0000		
Industrials	Coefficient	0,5322***	0,0642	0,0653	701
	p-value	0,0000	0,0537		
Information technology	Coefficient	0,8138***	0,1719**	0,1296	457
	p-value	0,0000	0,0028		
Materials	Coefficient	-0,0480	-0,1106*	0,0383	119
	p-value	0,5312	0,0125		
Telecommunication services	Coefficient	0,2908	0,0022	0,0916	35
	p-value	0,0583	0,9856		

Table 3: Regression statistics with industry median cash to sales benchmark. Displayed for the whole sample at the top followed by individual sectors.
***/**/* represent significance levels of 0.1% / 1% / 5% respectively

Industry-specific analysis: Weighted average benchmark

Subsample		ΔCS+	ΔCS-	Median weighted average cash to sales	Observations
All firms	**Coefficient**	**0,4426*** **	**0,0667** **	**0,1273**	**1755**
	p-value	**0,0000**	**0,0020**		
Consumer discretionary	Coefficient	0,6360***	0,0375	0,0810	208
	p-value	0,0002	0,5688		
Consumer staples	Coefficient	-0,1630	0,1512	0,1568	59
	p-value	0,4723	0,1711		
Energy Utilities	Coefficient	-0,0320	0,2879**	0,1279	41
	p-value	0,8194	0,0060		
Health care	Coefficient	0,5735***	0,3188**	0,1707	169
	p-value	0,0009	0,0030		
Industrials	Coefficient	0,2718**	0,0718*	0,0887	687
	p-value	0,0044	0,0165		
Information technology	Coefficient	0,4101**	0,1892***	0,3332	437
	p-value	0,0031	0,0003		
Materials	Coefficient	-0,0354	-0,1085*	0,0421	119
	p-value	0,7046	0,0118		
Telecommunication services	Coefficient	0,3881	0,0943	0,1231	35
	p-value	0,0667	0,3585		

Table 4: Regression statistics with weighted average cash to sales benchmark. Displayed for the whole sample at the top followed by individual sectors.
***/**/* represent significance levels of 0.1% / 1% / 5% respectively

4.1.1 INDUSTRY SPECIFIC REGRESSION RESULTS

Using the industry median as benchmark we find two sectors out of eight with significance in both of the deviation coefficients. Telecommunication services is the only sector, using the median model, where none of the coefficients are significant. It also yields no statistical significance, together with consumer staples, in the weighted average model, indicating that cash holdings does not have an impact on firm valuation for those sectors. Thus, telecommunication services is the "worst" performer in the study and this might be explained by the low number of observations included.

With the weighted average benchmark, we find both coefficients significant in three out of eight sectors, in addition to significance in both of the cash related variables for the whole sample. The cash related variables for the health care sector are among the largest in our study, where an incremental increase in cash to sales for the median model, is almost fully reflected in excess value (96.18%). Other industries of high growth e.g. information technology, follow the same pattern with a high coefficient estimate for positive cash deviations (81.38%). The sectors industrials and energy utilities are typical capital intensive industries, where additional cash held are rewarded with a significant increase in excess value (53.22% and 60.09% respectively). In the appendix we provide full industry specific regression results.

4.1.2 ADDITIONAL REGRESSION RESULTS

Unlike Reimund/Schwetzler (2004), we find no significance for the control variables, cash flow and capital expenditures, when looking at the regression statistics for the whole sample. As previously mentioned, we hypothesized that since the variables were included as proxies for profitability and growth opportunities, they ought to have a significant positive effect on excess value. This is however rejected for most sectors, though when significant, the coefficient is positive as initially expected. Despite finding little significance for the control variables, it might still provide an economic interpretation. Investors tend to not value firms, with higher growth or higher profitability than the median firm, at premium. This in turn might be a result of non-sustainable growth rates. Interestingly, we find strong evidence that market capitalization has a

small, yet positive, effect on excess valuation, thus supporting our hypothesis that greater access to capital markets yields a higher excess valuation. Leverage is highly significant in both models, with a rather large positive coefficient, indicating that more levered firms have a higher excess valuation compared to the corresponding imputed enterprise value. This is in line with our expectations. Additional tables with complete regression statistics for individual sectors can be found in the appendix.

All firms - Median

Variable	**Coefficient**	**t-statistic**	**p-value**
Constant	-0,2563	-6,364682	0,0000
Cash flow	0,0000	0,018653	0,9851
Market capitalization	0,0000***	5,826327	0,0000
Capital expenditures	0,0000	-0,91399	0,3609
Leverage	1,2877***	10,89088	0,0000
ΔCS^+	0,7129***	17,02899	0,0000
ΔCS^-	0,0189	0,894698	0,3711
Observations	1860		
Adjusted R^2	78,47%		

Table 5: Regresion statistics for the whole sample, with the median industry cash to sales as benchmark.
***/**/* represent significance levels of 0.1% / 1% / 5% respectively

All firms - Average

Variable	**Coefficient**	**t-statistic**	**p-value**
Constant	-0,0510	-1,3870	0,1656
Cash flow	0,0000	0,0284	0,9773
Market capitalization	0,0000***	5,9685	0,0000
Capital expenditures	0,0000	-1,2605	0,2077
Leverage	0,9235***	7,7114	0,0000
ΔCS^+	0,4426***	6,9824	0,0000
ΔCS^-	0,0667**	3,0986	0,0020
Observations	1755		
Adjusted R^2	70,03%		

Table 6: Regresion statistics for the whole sample, with the weighted average industry cash to sales as benchmark.
***/**/* represent significance levels of 0.1% / 1% / 5% respectively

CHAPTER 5

ANALYSIS

This chapter contains deeper analysis based on the results presented in the previous chapter. The chapter starts off with a general discussion, continues with linking results to the key theoretical concepts presented in chapter 2 and towards the end focus is put on comparing our findings with previous studies.

5.1 GENERAL DISCUSSION

As shown in tables 3 and 4 above, we find varying results for different industries. Overall we find strong evidence that holding less cash than an industry benchmark yields a lower excess value. This might be due to a more heavily discounted equity base, if lower cash holdings increase the risk premium for firms' equity. Cash holdings above industry median have shown significant positive effects on excess valuation, contradicting our hypothesis, and might follow the same reasoning as previously stated: that the equity base is discounted using a lower risk premium, thus yielding a higher valuation. A higher level of cash holdings would make you less exposed to the risk of facing liquidity problems. This would match one of the reasons for holding cash, first stated by Keynes (1936), the precautionary motive.

The materials sector provides evidence that having less cash holdings than the industry average will have a positive effect on excess value (see tables 3 and 4). The differences in sign might be explained by industry specific factors not captured by the model. A limitation in the study is that the industry specification provided by Nasdaq OMX Stockholm is very rough, not enabling us to differentiate industries on a deeper level. One might also attribute differences in regression results to more firm specific costs and benefits of corporate cash holdings rather than industry specific, thus providing insignificant coefficients. Due to the possibility of firm specific factors overpowering the industry specific ones, the results have to be interpreted with care.

Market capitalization, used as a proxy for access to the capital markets, had a significantly positive effect on excess value (see tables 5 and 6). Even though the coefficient is small, it is statistically significant on a 0.1% level, telling us that better access to capital markets positively affects valuation. This gives an indication that investors value firms' ability to raise external capital when in need, thus providing them the ability to take on projects quickly regardless of their internal financial strength. Firms with sufficient access to capital markets would not have to deny taking on projects because of insufficient internal funds to the same extent as firms with weaker access to capital markets.

The large and statistically significant coefficient estimate for leverage indicates that firms could benefit from increasing leverage (see tables 5 and 6). Increasing leverage signals that a firm, financially, can take on more debt without stressing its financial health while reducing its leverage may communicate a currently stretched financial position and that reducing its debt outstanding is necessary to gain a more balanced capital structure. Shifting risk by increasing leverage seems to render a positive excess valuation of the firm and is in line with the theory of asset substitution and risk shifting.

By changing the industry benchmark to a weighted average, the median cash to sales ratio effectively increases, except for the two sectors health care and energy utilities. This implies that the regression is going to be more geared towards negative deviations, increasing the observations below the industry benchmark, and might explain why the negative deviations show statistical significance in the second model and not the first. Using the median cash to sales benchmark effectively splits the sample in two roughly similar sized samples, containing 1086 positive deviations and 1084 negative deviations. The weighted average cash to sales benchmark gives us 647 positive deviations and 1407 negative deviations. However, despite the decreased number of observations above the industry benchmark, the positive coefficient prevails in the second model and stays statistically significant, further strengthening the conclusion that a higher level cash holdings than an industry benchmark yields a higher valuation.

5.2 COSTS AND BENEFITS OF CASH HOLDINGS

Considering our initial expectations about cash deviations, the cross-industry variation of the coefficient estimates could possibly contain information about benefits and costs related to cash holdings. Positive deviations (ΔCS^{+}) i.e. more than the industry benchmark, was expected to have a negative effect and thus ought to reveal information about the possible costs of excess cash. Negative deviations (ΔCS^{-}) on the other hand should reveal information of the possible benefits of cash holdings.

A positive coefficient for excess cash holdings might indicate that the Swedish stock market reward precautionary cash holdings, and that the potential costs that come with excessive cash does not outweigh the benefits of lowering the risk of potential liquidity problems. More specifically; Swedish corporate governance might lower the risk of overinvestment relative to other countries, thus lowering the "cost" and diminish in comparison with other, perhaps considered more important, benefits e.g. precautionary motives.

The negative valuation effect following firms with less cash holdings than the corresponding industry benchmark might reveal the markets anxiety concerning liquidity risk and costly external financing. When holding less cash, the risk of being out powered by industry rivals with greater financial muscle may also contribute to a lower valuation. More specific theory based costs and benefits will be discussed later in this section.

A positive valuation effect from excessive cash holdings can also be explained by transaction costs. Investment banking fees, costs from related to asset sales and distress costs are examples of transaction costs that might constitute reasons for corporations to hold larger cash holdings. Having lower cash holdings increase the distress costs and the decreased hedge against uncertainties of cash inflows and outflows, defined by Keynes (1936) as transaction motives. The positive coefficient for excessive cash holdings indicates that investors put value in holding cash (see tables 5 and 6). From a transaction costs perspective this could be explained by investors perceiving it relatively costly to raise external capital or that they fear volatile future cash flows. The reason behind why the coefficient for negative deviations in cash holdings in the materials

sector could be due to low asset-specificity. The majority of the assets held by firms within the sector (e.g. mining corporations) is commodity-like and could relatively easily be divested upon need. Thus, there is less need for hoarding cash in a precautionary motive for such firms and doing so may lead to a dismissal by investors – lowering the value of the firm. From this perspective, investors would rather see the firms within this sector relatively more heavily invested in assets than holding liquid funds and upon a stretched financial position to sell off assets.

The pecking order theory states that internally generated funds is the cheapest source of financing and that external financing can be costly as a result of information asymmetries. Due to this, firms might have larger cash holdings for future financing needs, taking into account the costs of raising external funds, and thus be rewarded with a higher valuation. This is also a possible explanation of the positive coefficient for excessive cash holdings. Having less cash makes the firm more prone to raise external capital at a high cost. Company outsiders cannot fully determine the value-addition of an investment, making it more costly for the firm to raise external financing i.e. higher discount rate for an equity issue or higher required interest rates for a bond issue.

Firms may hold a certain amount of cash, in order to prevent new entrants to the market. Telser (1966) describes it as a "long purse", and further defines it as a strategic tool to drive new entrants out of the market by using predatory practices. Holding more cash than the industry benchmark might act as a signal that the firm is able, and has the financial capabilities, to protect its market share and thus is granted a higher valuation. More cash at hand would also allow firms to quickly exercise growth opportunities, which would be especially valuable if the growth opportunity can be exercised only once and limited to one player. Results indicate that potential benefits of holding less cash – increasing strategic commitment – does not outweigh costs related to holding lower levels of cash, and are thus somewhat contradictive to what Myers/Rajan (1998) suggest.

Broad aspects of agency theory concerning cash holdings, deal with different costs and benefits concerning investment activity and managers not making decisions based on value maximization.

Having excessive cash could lead to overinvestment costs and management entrenchment. Lowering cash holdings i.e. our ΔCS^{-} estimate, could reveal information about the benefits of avoiding these costs. As our result states, the benefits of avoiding these agency costs by lowering cash holdings are not fully appreciated by the market, lowering the enterprise value. The anticipated benefits of holding higher levels of liquid assets seem to outweigh the benefits of avoiding the costs that might follow lower levels cash holdings.

From a tax perspective and at the current Swedish corporate tax rate, our results suggests that costs related to tax payments on interest earned on idle cash are less than the benefits of holding cash. Reducing levels of cash in order to lower the tax burden from earning interest on liquid positions seems not to overpower the aggregate benefits of holding higher levels of cash.

We attribute the significant negative valuation effects to increasing risks of liquidity problems when holding lower levels of liquid funds in market downturns and primarily in market upswings and to costs related to transactions costs and information asymmetry when raising external financing to fund projects. In an elaborative manner we could divide the market into two states in order to explain the negative effect on valuation caused by holding lower levels of cash. One state is characterized by recession in the economy and the other state is distinguished by a booming economy. In a recession we argue that the investors fear the risk of firms being unable to fulfill its financial obligations and thus find holding higher levels of cash valuable. Also, in market recessions, asset prices are typically depressed and possibilities for firms to make acquisitions relatively cheaply is good, why investors find it valuable holding higher levels of liquid funds in this sense as well. In a booming market we argue that the fear among investors lies in firms not being able to expand its business and taking advantage of the market condition due to insufficient levels of liquid funds to pursue those expansions, and thus have to raise capital externally which is costly mainly due to transaction costs and information asymmetry.

Comparing our regression results on the cash to sales variables to the ones of Reimund/Schwetzler (2004) we find great similarities. We too find evidence of the cash to sales variable having significant impact on excess valuation, positive cash to sales deviations having a positive impact on valuation and negative cash to sales deviations having negative impact on

valuation. The coefficient for positive deviations is significantly positive when using the median as well as the weighted average as benchmark while the coefficient for negative cash to sales deviations is significantly positive only when using the weighted average as benchmark. Reimund/Schwetzler (2004) find significance in both types of deviations using the median as benchmark and thus, their findings partly differs from ours. A reasonable explanation for our coefficient for negative deviations being significant when using the weighted average as benchmark may be because of a higher cash to sales median which leads to more observations being negatively deviated from the benchmark. Our model is partly lacking when applied to individual sectors. Studying tables 3 and 4 one can find sectors containing fewer observations to be the ones where the model fails to explain excess valuation by the level of cash holdings. Extending the number of observations may be a possible remedy for this problem and a supporting factor of this is that the degree of significance is strongly biased to the sectors containing more observations. Looking at the explanatory power of our median model in comparison to the corresponding one of Reimund/Schwetzler (2004) we see that our model has an adjusted R^2 of 78.43% while their corresponding adjusted R^2 reaches 13.86%. Potential motivations for this may be differences in market characteristics between the Swedish stock market and the German equivalent – and the firms operating in these – and that the model of use fits different equity markets unequally well.

Applying the concept of Faulkender/Wang (2006), suggesting that the present value of one dollar is greater than just one dollar for firms with a high level of investment opportunities, the positive effect of holding cash on firm valuation could indicate that the firms in our study are rich on investment opportunities.

CHAPTER 6

CONCLUSIONS

This final chapter presents concluding remarks from the performed research. Finally, we give suggestions that will further contribute to the corporate cash holdings literature.

This thesis examines whether corporate cash holdings affect corporate valuation. By replicating and applying the method, previously used by Reimund/Schwetzler (2004) on the German market, on the Swedish stock market. We find that the level of corporate cash holdings significantly affect excess valuation, on an aggregate level. We measure the relative over- or undervaluation by taking the logarithm of the ratio actual enterprise value to imputed enterprise value, and run panel data regressions using a set of control variables and two variables measuring positive and negative cash deviations.

For regressions on the whole sample, using the industry median cash to sales benchmark, we find significance for positive cash deviations but a non significant coefficient for negative cash deviations. This result differs from the study performed on the German market, where both cash related variables was found significant. By changing the industry benchmark from an industry median to a weighted average, we attain significance for both our cash related variables. Positive cash deviations are found to have a significantly positive effect on excess valuation using both benchmarks, partly in contradiction to our hypothesis. Negative deviations are found to have a significantly negative effect on excess value when using the weighted average industry benchmark, partly supporting our hypothesis, but found insignificant when using the industry median.

A positive and significant coefficient for positive cash deviations leaves us with two possible interpretations, similar to the findings of Reimund/Schwetzler (2004). Firstly, it raises doubt on the general trade-off hypothesis, when on an aggregate level there are no significant

disadvantages from increased cash holdings. Secondly, the general trade-off hypothesis can still be viable and the costs of having excessive cash are based on more firm specific than industry specific factors e.g. ownership structure, something not captured by the applied model. Whether our findings support the first or the second interpretation is subject to additional research. Since annual report data does not capture the dynamic changes in corporate cash holdings during the year, one could raise the question if it accurately reflects the dynamic nature of cash and short term investments. However, due to limited reporting concerning corporate cash holdings there is no other alternative source to create a more dynamic study. Research on how to improve the model in capturing these dynamics may be an area for further improvement.

We contribute to the corporate cash holdings literature by significantly showing that the benefits of positive cash deviations from an industry benchmark outweigh the benefits of negative cash deviations, in other words positive cash deviations are less costly than negative cash deviations. This study could benefit firms on the Swedish market in cash management and cash policy decisions and act as an indication of what factors drive excess value on the Swedish market.

In conclusion, we argue that firms should not overlook the level of cash, due to significant effects on firm valuation. Our findings suggest that cash policy is nontrivial in order to create shareholder value.

REFERENCES

ARTICLES

Almeida, H./Campello, M./Weisbach, M. S. (2002): Corporate Demand of Liquidity, Working Paper, New York University, 2002.

Andrade, G./Kaplan, S. N. (1998): How Costly is Financial (Not Economic) Distress? Evidence from Highly Leveraged Transactions, in: Journal of Finance, Vol. 53, 1998, pp. 1443 – 1493.

Baker, G. (1986): Compensation and Hierarchies, Harvard Business School, 1986.

Baskin, J. (1987): Corporate Liquidity in Games of Monopoly Power, in: The Review of Economics and Statistics, Vol. 69, Issue 2, 1987, pp. 312 – 319.

Baumol, W. J. (1952): The Transaction Demand for Cash: An Inventory Theoretic Approach, in: Quarterly Journal of Economics, Vol. 66, 1952, pp. 545 - 556.

Berger, P. G./Ofek, E. (1995): Diversification's Effect on Firm Value, in: Journal of Financial Economics, Vol. 37, 1995, pp. 39 – 65.

Cossin, D./Hricko, T. (2000): The Benefits of Holding Cash: A Real Options Approach, Working Paper, University of Lausanne, 2000.

Dittmar, A./Mahrt-Smith, J./Servaes, H. (2002): Corporate Liquidity, Indiana University Working Paper, 2002.

Drobetz, W./Grüninger, M. C./Hirschvogl, S. (2010): Information asymmetry and the value of cash, in: Journal of Banking & Finance, Vol. 34, 2010, pp. 2168 – 2184.

Faulkender, M./Wang, R. (2006): Corporate Financial Policy and the Value of Cash, in: Journal of Finance, Vol. 61, No. 4, 2006, pp. 1957 – 1990

Foley, C. F./Hartzell, J.C./Titman, S./Twite, G. (2007): Why do firms hold so much cash? A tax-based explanation, in: Journal of Financial Economics, Vol.86, Issue 3, 2007, pp. 579 – 607.

Frésard, L./Salva, C. (2010): The value of excess cash and corporate governance: Evidence from US cross-listings, in: Journal of Financial Economics, Vol. 98, 2010, pp. 359 – 384.

Harford, J. (1999): Corporate cash reserves and acquisitions, in: Journal of Finance, 1999, Vol. 54, No. 6, pp. 1969 - 1997.

Jensen, M. C. (1986): Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers, in: American Economic Review, Vol. 76, 1986, pp. 323 – 329.

Keynes, J. M. (1936): The General Theory of Employment, Interest and Money, New York, 1936.

Kim, C.-S./Mauer, D. C./Sherman, A. E. (1998): The Determinants of Corporate Liquidity: Theory and Evidence, in: Journal of Financial and Quantitative Analysis, Vol. 33, No. 3, 1998, pp. 335 – 359.

Mikkelson, W. H./ Partch, M. (2003): Do persistent large cash reserves hinder performance? in: Journal of Quantitative and Financial Analysis forthcoming, 2003.

Murphy, K. J. (1985): Corporate performance and managerial remuneration: An empirical analysis, in: Journal of Accounting and Economics, Vol. 7, Issue 1-3, 1985, pp. 11 – 42.

Myers, S. C. (1984): The Capital Structure Puzzle, in: Journal of Finance, Vol. 39, No. 3, 1984, pp. 575 – 592.

Myers, S. C./Majluf, N. S. (1984): Corporate financing and investment decisions when firms have information that investors do not have, in: Journal of Financial Economics, Vol. 13, Issue 2, 1984, pp. 187 – 221.

Myers, S. C./Rajan, R. G. (1998): The Paradox of Liquidity, in: The Quarterly Journal of Economics, Vol. 113, No. 3, 1998, pp. 733 – 771.

Opler, T. C./Titman, S. (1994): Financial Distress and Corporate Performance, in: Journal of Finance, Vol. 49, No. 3, 1994, pp. 1015 – 1040.

Opler, T./Pinkowitz, L. F./Stulz, R. M./Williamson, R. (1999): The Determinants and Implications of Corporate Cash Holdings, in: Journal of Financial Economics, Vol. 52, Issue 1, 1999, pp. 3 – 46.

Opler, T./Pinkowitz, L. F./Stulz, R. M./Williamson, R. (2001): Corporate Cash Holdings, in: Journal of Applied Corporate Finance, Vol. 14, Issue 1, 2001, pp. 55 – 67.

Pinkowitz, L. F. (2000): The Market for Corporate Control and Corporate Cash Holdings, Working Paper, Georgetown University, 2000.

Pinkowitz, L. F./Stulz, R. M./Williamson, R. (2006): Does the Contribution of Corporate Cash Holdings and Dividends to Firm Value Depend on Governance? A Cross-Country Analysis, in: Journal of Finance, Vol. 61, No. 6, 2006, pp. 2725 – 2751.

Pinkowitz, L. F./Stulz, R. M./Williamson, R. (2007): Cash Holdings, Dividend Policy, and Corporate Governance: A Cross-Country Analysis, in: Journal of Applied Corporate Finance, Vol. 19, Issue 1, 2007, pp. 81 – 87.

Pulvino, T. C. (1998): Do Asset Fire Sales Exist? An Empirical Investigation of Commercial Aircraft Transactions, in: Journal of Finance, Vol. 53, No. 3, 1998, pp. 939 – 978.

Reimund, C/Schwetzler,B (2004): Valuation Effects of Corporate Cash Holdings: Evidence from Germany, HHL Working Paper, 2004.

Shleifer, A./Vishny, R. W. (1992): Liquidation Values and Debt Capacity: A Market Equilibrium Approach, in: Journal of Finance, Vol. 47, No. 4, 1992, pp. 1343 – 1366.

Stiglitz, J. E./Weiss, A. (1981): Credit Rationing in Markets with Imperfect Information, in: American Economic Review, Vol. 71, No. 3, 1981, pp. 393 – 410.

Telser, L. G. (1966): Cutthroat Competition and the Long Purse, in: Journal of Law and Economics, Vol. 9, 1966, pp. 259 – 277.

BOOKS

Brooks, C. (2008): Introductory Econometrics for Finance (2nd edition), Cambridge.

Eviews 7: Users Guide Part II, HIS.

Koller, T./Goedhart, M./Wessels, D. (2010): Valuation: Measuring and Managing the Value of Companies (5th edition), Wiley.

Ogden, J.P./Jen, F.C./O'Connor, P.F. (2003): Advanced Corporate Finance: Policies and Strategies, Prentice Hall.

Saunders, M./Lewis, P./Thornhill, A (2009): Research Methods for Business Students (5th edition), Prentice Hall.

APPENDIX

INDUSTRY SPECIFIC REGRESSION RESULTS

Consumer discretionary - Median

Variable	Coefficient	t-statistic	p-value
Constant	-0,4847	-5,0106	0,0000
Cash flow	0,0000	-1,8749	0,0626
Market capitalization	0,0000***	3,9357	0,0001
Capital expenditures	0,0000*	2,0983	0,0374
Leverage	0,9966***	3,4043	0,0008
ΔCS^+	0,4954***	3,6439	0,0004
ΔCS^-	0,0235	0,3506	0,7264
Observations	208		
Adjusted R^2	74,58%		

Consumer discretionary - Average

Variable	Coefficient	t-statistic	p-value
Constant	-0,4326	-4,8976	0,0000
Cash flow	0,0000	-1,8185	0,0708
Market capitalization	0,0000***	3,6646	0,0003
Capital expenditures	0,0000*	2,0564	0,0413
Leverage	0,9754***	3,5155	0,0006
ΔCS^+	0,6360***	3,7752	0,0002
ΔCS^-	0,0375	0,5709	0,5688
Observations	208		
Adjusted R^2	75,40%		

Consumer staples - Median

Variable	Coefficient	t-statistic	p-value
Constant	-0,1595	-0,5830	0,5636
Cash flow	0,0000	1,5281	0,1355
Market capitalization	0,0000	0,3755	0,7095
Capital expenditures	0,0000	-1,0620	0,2955
Leverage	0,3055	0,4610	0,6476
ΔCS^+	0,3891	2,0010	0,0532
ΔCS^-	0,2925*	2,1368	0,0397
Observations	64		
Adjusted R^2	90,46%		

Consumer staples - Average

Variable	Coefficient	t-statistic	p-value
Constant	-0,3266	-1,3032	0,2024
Cash flow	0,0000	1,6172	0,1163
Market capitalization	0,0000	1,5002	0,1440
Capital expenditures	0,0000	-1,2550	0,2192
Leverage	0,3112	0,4962	0,6234
ΔCS^+	-0,1630	-0,7279	0,4723
ΔCS^-	0,1512	1,4022	0,1711
Observations	59		
Adjusted R^2	92,23%		

Energy Utilities - Median

Variable	Coefficient	t-statistic	p-value
Constant	-0,1314	-0,6019	0,5534
Cash flow	0,0000	-1,4931	0,1496
Market capitalization	0,0000	-0,5546	0,5848
Capital expenditures	0,0000	0,9491	0,3529
Leverage	1,2489**	2,9315	0,0077
ΔCS^+	0,6009***	6,7131	0,0000
ΔCS^-	0,0949	0,8411	0,4093
Observations	47		
Adjusted R^2	80,74%		

Energy Utilities - Average

Variable	Coefficient	t-statistic	p-value
Constant	0,0394	0,2675	0,7909
Cash flow	0,0000**	-2,8146	0,0085
Market capitalization	0,0000	-0,0052	0,9959
Capital expenditures	0,0000	1,8765	0,0704
Leverage	0,8648	2,3313	0,0266
ΔCS^+	-0,0320	-0,2303	0,8194
ΔCS^-	0,2879**	2,9543	0,0060
Observations	41		
Adjusted R^2	50,19%		

Health care - Median

Variable	Coefficient	t-statistic	p-value
Constant	0,1419	1,0406	0,2994
Cash flow	0,0000*	-2,0153	0,0453
Market capitalization	0,0000***	4,7434	0,0000
Capital expenditures	0,0000***	-3,5265	0,0005
Leverage	1,7617***	5,4963	0,0000
ΔCS^+	0,9618***	13,5841	0,0000
ΔCS^-	0,4626***	5,4991	0,0000
Observations	229		
Adjusted R^2	78,87%		

Health care - Average

Variable	Coefficient	t-statistic	p-value
Constant	-0,6583	-4,1231	0,0001
Cash flow	0,0000	-1,8080	0,0730
Market capitalization	0,0000***	3,8748	0,0002
Capital expenditures	0,0000	-1,8061	0,0733
Leverage	2,1230***	5,1846	0,0000
ΔCS^+	0,5735***	3,4172	0,0009
ΔCS^-	0,3188**	3,0310	0,0030
Observations	169		
Adjusted R^2	68,87%		

Industrials - Median

Variable	Coefficient	t-statistic	p-value
Constant	-0,2448	-4,9333	0,0000
Cash flow	0,0000	-0,9994	0,3180
Market capitalization	0,0000***	3,4047	0,0007
Capital expenditures	0,0000	0,0035	0,9972
Leverage	1,3206***	5,9826	0,0000
ΔCS^+	0,5322***	7,7753	0,0000
ΔCS^-	0,0642	1,9329	0,0537
Observations	701		
Adjusted R^2	78,68%		

Industrials - Average

Variable	Coefficient	t-statistic	p-value
Constant	-0,0758	-1,8205	0,0692
Cash flow	0,0000	-1,7224	0,0855
Market capitalization	0,0000***	4,4572	0,0000
Capital expenditures	0,0000	-0,0937	0,9254
Leverage	0,7070***	4,5164	0,0000
ΔCS^+	0,2718**	2,8604	0,0044
ΔCS^-	0,0718*	2,4042	0,0165
Observations	687		
Adjusted R^2	69,20%		

Information technology - Median

Variable	Coefficient	t-statistic	p-value
Constant	0,0463	0,7864	0,4321
Cash flow	0,0000	-0,6432	0,5205
Market capitalization	0,0000*	2,5625	0,0108
Capital expenditures	0,0000	-0,3798	0,7043
Leverage	1,3845***	5,3912	0,0000
ΔCS^+	0,8138***	9,3947	0,0000
ΔCS^-	0,1719**	3,0039	0,0028
Observations	457		
Adjusted R^2	75,49%		

Information technology - Average

Variable	Coefficient	t-statistic	p-value
Constant	0,3442	4,5827	0,0000
Cash flow	0,0000	-1,1407	0,2547
Market capitalization	0,0000*	2,3385	0,0199
Capital expenditures	0,0000	-1,7284	0,0848
Leverage	0,8878***	3,5356	0,0005
ΔCS^+	0,4101**	2,9791	0,0031
ΔCS^-	0,1892***	3,6302	0,0003
Observations	437		
Adjusted R^2	68,01%		

Materials - Median

Variable	Coefficient	t-statistic	p-value
Constant	-0,4783	-4,8080	0,0000
Cash flow	0,0000	-0,6075	0,5450
Market capitalization	0,0000***	5,5728	0,0000
Capital expenditures	0,0000	-1,3569	0,1782
Leverage	0,8865**	3,2337	0,0017
ΔCS^+	-0,0480	-0,6287	0,5312
ΔCS^-	-0,1106*	-2,5498	0,0125
Observations	119		
Adjusted R^2	79,69%		

Materials - Average

Variable	Coefficient	t-statistic	p-value
Constant	-0,5013	-4,9936	0,0000
Cash flow	0,0000	-0,5830	0,5613
Market capitalization	0,0000***	5,5657	0,0000
Capital expenditures	0,0000	-1,2825	0,2030
Leverage	0,8809**	3,2365	0,0017
ΔCS^+	-0,0354	-0,3803	0,7046
ΔCS^-	-0,1085*	-2,5708	0,0118
Observations	119		
Adjusted R^2	79,68%		

Telecommunication services - Median

Variable	Coefficient	t-statistic	p-value
Constant	-0,3729	-3,3439	0,0024
Cash flow	0,0000	1,4471	0,1590
Market capitalization	0,0000	0,4743	0,6390
Capital expenditures	0,0000	-0,0910	0,9281
Leverage	0,3825	1,2726	0,2136
ΔCS^+	0,2908	1,9739	0,0583
ΔCS^-	0,0022	0,0183	0,9856
Observations	35		
Adjusted R^2	55,56%		

Telecommunication services - Average

Variable	Coefficient	t-statistic	p-value
Constant	-0,3120	-2,5314	0,0173
Cash flow	0,0000	2,0140	0,0537
Market capitalization	0,0000	0,2330	0,8174
Capital expenditures	0,0000	-0,2064	0,8380
Leverage	0,3466	1,1776	0,2489
ΔCS^+	0,3881	1,9078	0,0667
ΔCS^-	0,0943	0,9337	0,3585
Observations	35		
Adjusted R^2	59,50%		