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Can managers use discretionary accruals to ease financial constraints prior to investment?

A study on Swedish listed firms

Abstract

In this thesis, we study the effects of financial constraints on financial reporting behavior by investigating whether discretionary accruals can signal good investment opportunities and enable access to external financing for financially constrained firms. We study a panel of firms listed on the Swedish main market between 2007-2015 and use established models for estimating discretionary accruals and investment opportunities. We find no conclusive evidence of there being differences in the use of discretionary accruals between financially constrained firms and their unconstrained counterparts. Using several measures of financial constraints, we do not find any evidence of discretionary accruals having a positive relationship with either investment or external financing for financially constrained firms with positive investment opportunities.

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1. Introduction

In perfect capital markets, all information is available to investors and since the level of internally generated capital does not affect managers' investment decisions, firms will invest in all positive investment opportunities (Modigliani & Miller, 1958). In markets where frictions exist, information asymmetries between managers and investors may cause financially constrained firms with lack of internal funds to forgo positive investment opportunities. Myers & Majluf (1984) state that managers have better information about future prospects of their firm than capital providers do. This information asymmetry problem can in turn increase the wedge between the cost of internal and external funds. The wedge will affect a firm's investment decisions, as the evaluation of investment opportunities cannot be assessed independent of the ability to use either internal or external funds to finance investments (Fazzari et al., 1988). Therefore, when a firm with positive investment opportunities faces financing constraints, some of the investments will be forfeited due to the costs of raising external capital exceeding the benefits of the investments.

As managers have information of future prospects of a firm that external capital providers do not have, they could convey these prospects and reduce information asymmetries through strategic financial reporting decisions. Dechow (1994) argues that investors rely more on reported earnings than on cash flow measures when making investment decisions. This suggests that investors see earnings as informative even if they might be inflated by the discretion of managers, through the use of discretionary accruals. Several studies have investigated the effect of earnings management and discretionary accruals on market frictions (Chaney & Lewis, 1995; Subramanyam, 1996; Louis & Robinson, 2005). These studies suggest that managers can, through the use of discretionary accruals, signal positive prospects of their firm and convey these prospects to investors to reduce information asymmetries. The argumentation above leads us to propose the following research question:

"Do financially constrained firms with good investment opportunities manage earnings upwards prior to investment, to ease financial constraints?"

In this thesis, our purpose is to examine whether managers of financially constrained firms with good investment opportunities can use strategic accrual reporting to signal their positive prospects of the firm to investors. We hypothesize that constrained firms with good investment opportunities use discretionary accruals prior to investment and that discretionary accruals could ease financial constraints by enabling access to external financing. Our research is

inspired by Linck, Netter & Shu (2013) and other previous studies conducted on U.S. data, which have found evidence of a relationship between discretionary accruals and corporate investment efficiency. However, these studies have used different approaches to delimitations of their samples and have presented slightly differing results. For example, Linck, Netter & Shu (2013) find that financially constrained firms with abnormally high levels of discretionary accruals obtain more external financing and invest in positive net present value (NPV) projects which increase a firm's investment efficiency. McNichols & Stubben (2008) find additional evidence for that discretionary accruals have a positive relationship with investment, but conclude that firms manipulating earnings will over-invest during the period of misreporting. Biddle, Hilary & Verdi (2009) present contradictory results and provide evidence for a negative relationship between investment and discretionary accruals for firms more prone to under-investment. They show that higher financial reporting quality, i.e. lower levels of discretionary accruals, can increase investment efficiency for cash constrained and highly levered firms, classified as firms more likely to be under-investing.

Our study is conducted on non-financial firms listed on Nasdaq Stockholm. We define firms with an abundance of investment opportunities as under-investing firms, subject to investment inefficiency. To measure investment opportunities, we use the measure Tobin's Q, developed by Brainard & Tobin (1968) and Tobin (1969), which suggests that capital investment efficiency is a function of the ratio between the market valuation of existing capital assets to their replacement cost. We categorize our sample of firms as either financially constrained or unconstrained following Biddle, Hilary & Verdi (2009) and Linck, Netter & Shu (2013), based on net leverage and cash balance. We measure a firm's level of discretionary accruals based on the performance adjusted model developed by Kothari, Leone & Wasley (2005). At last, we conduct two different regressions. In the first one we test whether financially constrained firms have higher levels of discretionary accruals prior to investment than unconstrained firms. In the second one we test whether there is a relationship between external financing and the level of discretionary accruals, for constrained firms.

1.1 Contribution

This thesis contributes to the understanding of firms' financial reporting decisions, and how these decisions affect corporate investments and the access to capital markets. Previous research has focused on the prevalence of earnings management in U.S. firms in relation to investment efficiency by studying the magnitude of both over-investment and under-investment. This study will contribute to the literature by only investigating the link between discretionary accruals

and investment efficiency for under-investing and financially constrained firms. The incentives to signal positive future prospects by using discretionary accruals are expected to be stronger for these firms, as they hold good investment opportunities that cannot be exploited with internal funds. We further contribute to the literature regarding financial reporting decisions and the impact on investments by conducting the study on Swedish listed firms where limited research has been done. We expect the effect of financial reporting on the accessibility to external capital markets to differ between Swedish and U.S. firms, as the ownership structure in Sweden is more concentrated than in the U.S. (Swedish Corporate Governance Board, 2016).

1.2 Delimitation

We limit our study to firms listed on Nasdaq Stockholm during the period 2007 - 2015. This period is chosen due to limitations in the data available in the database Retriever Business. Furthermore, we only include firms that are listed during a minimum of three consecutive years during this time period, since we need one year of lagging data and one year of leading data in order to conduct our tests. In line with other studies within this field (e.g. Biddle et al., 2009; Linck et al., 2013), we have excluded financial firms because the investment policy and capital structure for firms in this industry is very different from other industries.

As previously mentioned, we limit our sample to only include firms with good investment opportunities, meaning that a firm has positive NPV projects to exploit. After investigating the difference in the level of discretionary accruals between constrained and unconstrained firms prior to investment, we will proceed to look at the impact of discretionary accruals on external financing for firms classified as financially constrained. This means that we will exclude all observations which do not meet these criteria when conducting our second test. Moreover, we are not interested in investigating how a firm's share price and cost of capital is affected by discretionary accruals. Finally, we will not look into the mechanisms behind the relationship between discretionary accruals and corporate investment decisions, but only whether a relationship exists or not.

2. Theoretical Framework and previous research

This section will review the theory of corporate investment and the problem of information asymmetry, which is linked to a firm's financial constraints. We then present earnings management and how discretionary accruals can act as a signal to mitigate information asymmetry prior to investment.

2.1 Information asymmetry and Investment

A theory of corporate investment suggest that all information is available to investors and incorporated in the pricing of debt and equity, and that managers will invest in all positive NPV projects (Modigliani & Miller, 1958). This theory assumes perfect capital markets, where no frictions exist. In the real world, firms' investment decisions will be affected by frictions such as taxes, transaction costs and those arising from information asymmetries (Myers, 2001). When firms are resource constrained, investment will be affected by frictions associated with problems accessing financing from external capital markets.

Myers & Majluf (1984) argue that managers have better information than investors of a firm's future potential investments, and both managers and investors realize this. Moreover, Akerlof (1970) problematizes how unevenly distributed information between the buyer and the seller will cause the buyer to demand a discount on the product since the quality of the product cannot be assured. This adverse selection problem creates difficulties for firms to pursue worthwhile investments, since there is an imbalance between managers' access to superior information and investors' exposure to management's incentives to capitalize on this information. Therefore, it is hard for managers to convince investors that there are legitimate reasons for raising more debt or equity. If a manager has better information regarding a firm's prospects than the investor, the manager will be less motivated to sell securities when they are undervalued. Managers will rather sell overpriced securities, but ill-informed investors will consequently raise the cost of capital, which reduces the accessibility to external financing.

2.1.1 Investment efficiency

As the wedge between the cost of internal and external funds increases, the sensitivity of investment to internal funds will increase as well (Fazzari et al. 1988). Consequently, when a firm faces financing constraints, it will be limited to invest with the level of internal funds available, rather than making investment decisions based on available investment opportunities. This implies that firms with low cash balances will be more dependent on receiving external financing than unconstrained firms with more internal funds, to enable investment. Furthermore, the level of leverage can cause a firm to depart from the optimal level of investment. Due to external financing being costly, managers of highly levered firms might not be willing to exploit some of their positive investment opportunities and thereby suffer from debt overhang, which causes under-investment (Myers, 1977). The theory of debt overhang states that although debt financing can be beneficial due to tax-advantages, it can alter firms' corporate investment decisions. It is argued that highly levered firms will not undertake positive

NPV projects because part of the earnings from these projects will go to the creditors (Myers, 1977).

Other frictions that can cause investment inefficiencies to arise, are those suggested by the agency theory, proposed by Jensen & Meckling (1976). Managers of firms with an abundance of both investment opportunities and internal funds can, instead of returning cash to shareholders, pursue opportunistic investments and "empire building", thereby not taking actions in the interest of shareholders. This can cause a firm to over-invest as projects are exploited regardless of the value they bring to the firm. For example, Blanchard, Lopez-de-Silanes & Shleifer (1994) find that managers invest in projects that do not change the investment opportunity set, meaning that the investments are not improving the investment efficiency. In our study we focus on under-investing, financially constrained firms. Therefore, we will not be covering the agency problems behind over-investment any further.

2.1.2 Investment opportunities

Neoclassical investment theory states that investments should be made up to the point where the marginal expected rate of return on investment equals the cost of capital (Jorgenson, 1963). The most widely used measure to estimate investment efficiency is Tobin's Q, developed by Brainard & Tobin (1968) and Tobin (1969). The theory states that firms should increase investments if the market value of a firm's assets is worth more than their cost of replacement. When Tobin's Q is above the value of one, a firm has an abundance of investment opportunities and the manager will be incentivized to increase the firm's capital stock, since the capital installed in the firm is priced higher by the market than its acquisition cost.

One factor that might make a firm deviate from the optimal level of capital investment is information asymmetry between managers and capital providers. Since managerial assessment can differ from market assessment, information asymmetry can affect corporate investment decisions. Prior research (Stein, 2003) argues that firms with higher Tobin's Q will invest more. However, the ability to exploit investment opportunities is contingent on internally generated funds available and a firm's accessibility to external financing.

In recent years, authors have tried to develop the measure of Tobin's Q by finding alternative methods to measure investment efficiency. Mueller and Reardon (1993) developed the method of using marginal q as a measure of investment efficiency. Marginal q measures investment efficiency by studying the relationship between the return on marginal investments and the cost

of capital. As with the measure of Tobin's Q, a firm with a marginal q with a value of one invests efficiently and a value above one indicates that a firm is under-investing.

The central difference between marginal q and Tobin's Q is that the latter measures the average investment efficiency in relation to all investments made during a firm's entire life, whereas marginal q measures the investment efficiency during a certain time-period of interest (Mueller & Reardon, 1993). Compared to marginal q, Tobin's Q has the advantage of being easier to measure. For marginal q, an assumption of a specific depreciation rate has to be made which can lead to errors and reduce the comparability of the measure. As Tobin's Q has been covered more extensively in previous research, we use this measure to estimate whether a firm is under-investing and thus, holds good investment opportunities.

2.2 Earnings management

In perfect capital markets, financial reporting does not matter for corporate investment decisions, assuming all information is symmetric (Modigliani & Miller, 1958). However, in markets where frictions exist, managers could use financial reporting to potentially solve information asymmetry problems between managers and investors. In the theoretical model of Arya, Glover & Sunder (2003), reporting manipulation can be used as a mechanism to avoid the real effects of perfect transparency, which can otherwise cause managers to forsake good investment opportunities.

2.2.1 Real vs accrual-based earnings management

One aspect in financial reporting that has received much attention from prior research is earnings management. Earnings management is referred to as the action when managers inflate or deflate earnings and can be divided into two categories, real earnings management and accrual-based earnings management.

Real earnings management is defined by Roychowdhury (2006) as management's actions deviating from normal business practices with the intention to meet earnings thresholds. In contrast to accrual-based earnings management, real earnings management activities have direct effects on cash flows, since managers take real economic actions to smooth earnings over time. For example, these activities include postponing investments, overproducing and having unjustified discounts which increase sales at the moment but could lead to a decrease in sales in the longer run. Graham, Harvey & Rajgopal (2005) and Ewert & Wagenhofer (2005) show that managers are willing to take actions that, in the long run, could be negative for the firm, in order to enhance earnings in the near future. In this manner, real earnings management could

be a costlier approach than the alternative of using accrual-based earnings management. Real earnings management is difficult to detect since it is very hard to distinguish the action from normal business decisions.

Accrual-based earnings management occurs when managers borrow and move earnings from future periods of time, by for example postponing costs and bringing revenues forward (Kellog & Kellog, 1991). However, this must be done within accounting regulations, which causes the space for adjustments to be smaller compared to that of real earnings management. Moreover, discretionary accruals being moved in one direction will always have to be reversed sometime in the future. Accrual-based earnings management is easier to detect than real earnings management, even though it is not done without difficulties. Ways of detecting accruals-based earnings management will be discussed in section 2.2.7.

2.2.2 Definition of earnings management

There are many incentives behind using earnings management, which leads to the term having many definitions. The majority of researchers define earnings management in the context of opportunistic behavior by managers' use of financial reporting methods, adding noise to reported earnings. The most prevalent definition of earnings management is presented by Healy & Wahlen (1999):

"*Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter reports to either mislead some stakeholders or to influence contractual outcomes that depend on reported accounting numbers*."

However, Healy & Wahlen (1999) state that "standards must permit managers to exercise judgement", meaning that managers are allowed to use reporting discretion to convey information of the firm's future performance. Thus, the term "earnings management", as suggested by prior literature, is used in the context of reporting numbers not reflecting the accurate underlying economic performance of a firm. For example, in line with the definition of Schipper (1989) managers can use earnings management to influence reported earnings, deliberately adjusting the firm's external financial reports for personal gain, or to report more desirable results.

Dechow, Ge & Schrand (2010) define high quality earnings as "providing more information about the features of a firm's financial performance that is relevant to a specific decision made by a specific decision maker". This implies that the definition of earnings quality is dependent

on the context and motives behind altering financial reports. To refer to accounting regulation in Sweden, Årsredovisningslagen (1995:1554) states that financial reporting should give a fair representation of the firm and according to IFRS, financial reporting should "provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity" (IFRS, 2015).

In this study, we will refrain from using the term earnings management as we assume that the practice of strategic management of accruals is being done with the purpose of increasing earnings informativeness, which is not included in the definition of earnings management made by previous research. Therefore, in this thesis we will use the term strategic accrual reporting, when referring to the action of moving earnings over time, as we are interested in how managers can exercise reporting discretion to convey inside information.

2.2.3 Discretionary accruals vs non-discretionary accruals

Accruals is an accounting principle where income and expenditures are allocated to the correct period, since cash flow and performance do not always happen at the same time. Accruals are used to adjust for the differences between a firm's earnings and cash flow during a period, and they should help to better portray the real performance of a firm. Total accruals are calculated as the difference between reported net income and cash flow from operations.

Total accruals can be divided into two different components, discretionary accruals and non-discretionary accruals. Non-discretionary accruals are assumed to depend on the natural impact of the business actions of the firm, while discretionary accruals, on the other hand, are assumed to result from the manipulation of earnings by the managers of a firm, or from estimation errors (Dechow et al., 2010).

2.2.4 Discretionary accruals to improve information

Information can be communicated indirectly through financial reporting as stated by Healy & Palepu (1993):

"Financial reporting is a potentially useful mechanism for managers to communicate with outside investors.....Because accrual accounting not only require managers to record past events, but also to make forecasts of future effects of these events, financial statements have potential to convey managers' superior information".

Reviewing several European surveys, research has found that information in annual reports is a highly important source to capital providers for financial decision making (Cascino et al.,

2013). Comparable findings have also been presented in the U.S. (CFA Institute, 2013). Moreover, Hjelmström, Hjelström & Sjögren (2014) find that capital market actors in Sweden perceive financial reports as useful for valuation and investment decisions. As investment decisions require future oriented information, annual reports provide an insight in firm's future opportunities.

When information asymmetries are prevalent, managers may provide information to capital market decision makers by using discretionary accruals as a signal of their positive prospects. For example, Subramanyam (1996) finds evidence for discretionary accruals being informative by presenting a correlation between stock returns and unexpected accruals. This suggests that managers can exert discretion in reporting if they have information of a firm's future prospects, to align incentives with owners. Chaney & Lewis (1995) find that for undervalued firms, when information asymmetry prevails between managers and investors, the strategic management of reported earnings can reveal information about future prospects of the firm. They argue that a firm will use discretionary accruals only if the benefits from the procedure exceed the costs, since moving earnings from low to high is costly for firms due to excess tax expenses. Additionally, the costs of litigation and disruption of operations can cause managers to refrain from the action of strategic accrual reporting (Dye, 1988; DuCharme et al., 2004). Consequently, it is expected that firms with lack of internal funds but with good investment opportunities will be more incentivized to engage in strategic accrual reporting than firms with an abundance of internal funds. This can be explained by the potential benefit of the action being higher for constrained firms, as it enables them to raise capital necessary to invest.

2.2.5 Discretionary accruals to ease financial constraints

Financial information presented to investors affects how willing investors will be to provide external capital to the firm, or banks to provide loans (Alexander & Nobes, 2010). In prior research, incentives for using discretionary accruals are shown to be present when a firm is in need of attracting external financing (e.g. Dechow et al., 1996). To gain access to external capital, discretionary accruals can be used to inflate the value of the firm. Several U.S. studies have examined the existence of income increasing discretionary accruals surrounding the period of equity offerings, (e.g. Teoh et al., 1998a; Teoh et al., 1998b; Rangan, 1998; Shivakumar, 2000). Thus, findings indicate that firms manage discretionary accruals upwards prior to equity offerings and that this reduces the cost of external financing. This would improve the possibility that a firm obtains external financing to finance profitable investments. By inflating earnings,

strategic accrual reporting could also increase creditors' assessment of a firm's ability to repay debt.

2.2.6 Discretionary accruals and investment efficiency

Although previous studies have found the presence of discretionary accruals prior to obtaining financing for investments, there have been mixed results on whether discretionary accruals relate to more efficient investments. McNichols & Stubben (2008) find that firms manipulating earnings, will over-invest during the period of misreporting and Biddle, Hilary & Verdi (2009) provide evidence for a negative relationship between investment and discretionary accruals for firms more prone to under-investment. They show that higher financial reporting quality, which they define as less discretionary accruals, can increase investment efficiency for cash constrained and highly levered firms who are more likely to under-invest. They mean that using more discretionary accruals leads a firm to deviate from the predicted level of investment.

A recent study by Linck, Netter & Shu (2013) shows that managers of financially constrained firms with good investment opportunities can use discretionary accruals as a signal of their positive prospects. They show that discretionary accruals enable firms to raise capital necessary for investment and that the investments appear to be in valuable projects. Biddle & Hilary (2006) investigate the effects on accounting disclosure and investment efficiency in a cross country sample of U.S. and Japanese firms. They find that the latter sample exhibits a weaker relationship between investment efficiency and publicly disclosed accounting information. They argue that suppliers of capital in Japan, such as company consortiums and banks, have access to private sources of information, meaning that public accounting disclosure is not as important to their decisions.

2.2.7 Methods for estimating discretionary accruals

What most accrual based models have in common is that they attempt to separate the discretionary part of accruals from total accruals. To obtain the discretionary part, the non-discretionary part of accruals is estimated using a model and is then subtracted from total accruals. Healy & Wahlen (1999) state that the most difficult part about measuring discretionary accruals is estimating earnings net of earnings management. There have been several methods introduced attempting to solve this problem, and they have different strengths and weaknesses. These methods will be described below.

One of the first models detecting earnings management was developed by Healy (1985), who predicts that non-discretionary accruals equal the mean of total accruals within a certain group.

Unlike many other models developed, Healy assumes that earnings management occurs in every period. DeAngelo (1986) developed this model further by using total accruals from the previous period as a proxy for non-discretionary accruals. What the Healy- and the DeAngelo models both have in common, is that these models use total accruals as a proxy for non-discretionary accruals. However, unlike Healy, DeAngelo assumes that accruals in the previous year are completely non-discretionary.

The assumption that non-discretionary accruals are constant, assumed by both models, has been criticized by Kaplan (1985), who points out that the level of non-discretionary accruals will depend on changes in the economic circumstances of a firm. The model developed by Jones (1991) was the first to relax the assumption that non-discretionary accruals are constant, and her model attempts to control for the effects of changes in a firm's economic performance. The Jones model makes the assumption that revenues are completely non-discretionary which causes the model to understate discretionary accruals when earnings are managed through revenues. The Modified Jones model, developed by Dechow, Sloan & Sweeney (1995), is an extension of the Jones model. It gives a better proxy for earnings management by subtracting the change in accounts receivables from the change in revenues, thereby relaxing the assumption that revenues are completely non-discretionary. This model has become the most commonly used model to estimate discretionary accruals.

McNichols (2002) and Kothari, Leone & Wasley (2005) were next to make developments to the Jones- and Modified Jones model. McNichols combined the Jones model with a cash-flow oriented approach to measure discretionary accruals, as suggested by Dechow & Dichev (2002). This model proves to generate a higher explanatory power since accruals anticipate future cash outflows and inflows. Kothari, Leone and Wasley (2005) extended both the Jones and the Modified Jones model and introduced performance matching, controlling for the normal level of accruals based on the level of return on assets. The reason for this was that several studies had reached the conclusion that there is a correlation between firm performance and accruals. There are two more recent models that have received some attention in the past years. One is the model introduced by Burgstahler, Hail & Leuz (2006) that measures discretionary accruals by studying the ratio of absolute accruals to absolute cash flows. The second model is developed by Stubben (2010) who focuses on the relationship between the change in revenues and the change in accounts receivables.

We will conduct this study by using the performance adjusted model developed by Kothari, Leone & Wasley (2005), as this model has been used in previous research (Linck et al., 2013) relating discretionary accruals to investment efficiency.

3. Hypotheses

In the theoretical background and presentation of previous research, we have provided a basis for the relationship between discretionary accruals and firm level capital investment.

If a firm has lack of internal funds, but holds good investment opportunities, the firm will be dependent on external capital markets to fund investments. A firm can signal its positive prospects to investors through strategic accrual reporting (Subramanyam, 1996). Since the strategic management of discretionary accruals will be done only if the benefits exceed the costs, as suggested by Chaney & Lewis (1995), the motivation for financially constrained firms to use discretionary accruals is expected to be higher than for their unconstrained counterparts. Therefore, we aim to investigate whether firms classified as financially constrained, holding good investment opportunities, will engage in strategic accrual reporting to signal these to potential investors. This leads us to propose the following hypothesis:

H1a: Financially constrained firms with good investment opportunities have higher levels of discretionary accruals, compared to their unconstrained counterparts.

After studying the level of discretionary accruals for constrained firms, we proceed to investigate whether these firms have higher discretionary accruals when they plan to invest in the subsequent period. Constrained firms with good investment opportunities are expected to deviate from their optimal investment level because of information asymmetry between managers and investors. Since prospects of future growth are conveyed by information from financial reports, investment decisions for constrained firms will be dependent on how managers can convey these prospects to investors. Constrained firms will invest if the cost of acquiring capital is lower than the benefit of investment (Chaney & Lewis, 1995), which is contingent on how capital providers value a firm's future prospects. This will cause firms to engage in strategic accrual reporting to enable investment. This leads us to propose the following hypothesis:

H1b: For financially constrained firms with good investment opportunities, discretionary accruals increase with the level of investment in the subsequent period.

In our second hypothesis, we investigate the relationship between discretionary accruals and the level of external financing obtained, for financially constrained firms with good investment opportunities. As suggested by Alexander & Nobes (2010), financial information presented to investors affects how willing investors will be to provide external capital to the firm, or banks to provide loans. A study conducted by Linck, Netter & Shu (2013) examines external financing for constrained firms on a sample of U.S. firms and suggests that high-accrual firms issue significantly more external financing than their low-accrual counterparts, prior to investment. These findings imply that financially constrained firms with good investment opportunities can use strategic accrual reporting to signal these prospects, and thereby gain access to external financing channels, and ease financial constraints. This leads us to propose the following hypothesis:

H2: High-accrual constrained firms with good investment opportunities obtain more external financing than their low-accrual counterparts.

4. Method

In this section, we will present our models used for estimating investment efficiency, financial constraints and the level of discretionary accruals. We will then continue by presenting our two regression models.

4.1 Research method

In order to conduct our tests of whether financially constrained firms with good investment opportunities use strategic accrual reporting to obtain financing and enable investment, we need to classify our sample in to various groups. We begin by identifying firms with good investment opportunities based on the measure Tobin's Q. We classify our sample of firms as either financially constrained or unconstrained based on their levels of net leverage and cash balance. We then measure a firm's level of discretionary accruals based on the performance adjusted model. For robustness, we also measure discretionary accruals with the widely used Modified Jones model, and we use an additional measure of financial constraints, cash flow from operations. To test our first hypothesis, we run a regression to examine whether constrained firms have higher levels of discretionary accruals than unconstrained firms and if the level changes with the degree of investment in the subsequent period. Our second hypothesis is examined by running a regression to test whether the level of discretionary accruals increases the ability to obtain external financing for financially constrained firms.

4.2 Classification of the firms

4.2.1 Investment opportunities

We define firms with good investment opportunities by using the measure Tobin's Q, developed by Brainard & Tobin (1968) and Tobin (1969). Tobin's Q measures the average investment efficiency of a firm, including all the investment decisions ever made in the firm. Tobin's Q is defined as the market value of a firm, divided by the replacement costs of its assets, *see Equation 1*. The market value of the firm is the sum of the market value of equity and the book value of debt. The replacement cost of assets is measured as the book value of total assets.

$$Tobin's\ Q = \frac{Total\ Assets - Book\ value\ of\ Equity + Market\ value\ of\ Equity}{Total\ Assets} \quad (1)$$

Firms with a value of Tobin's Q above one are considered to be under-investing and having good investment opportunities. Such firms should according to the theory of Tobin's Q, increase their capital stock by investing. The reason for this is that the value of a firm's investments is priced higher by the market than the cost of acquiring its assets. Conversely, firms with a value of Tobin's Q below the value of one, are considered to be over-investing and should decrease their capital stock.

4.2.2 Financial constraints

Following Biddle, Hilary & Verdi (2009), we use a combined measure based on net leverage and cash balance as a proxy for whether a firm is financially constrained or not. Both of these measures are proven by prior literature to relate to the level of a firm's financial constraints (Kaplan & Zingales, 1997). Firms with lower cash-balances are considered more likely to be financially constrained since they do not have a substantial amount of internal funds to use for investment. Instead, it would have to rely on external financing to be able to exploit positive investment opportunities. Firms with high levels of net leverage are considered more likely to be financially constrained due to the risk of debt overhang which causes them to under-invest (Myers, 1977). For definitions of net leverage and cash balance, *see Equation 2 & 3.*

$$Net\ leverage = \frac{Net\ Debt}{Net\ Debt + Equiy} \quad (2) \qquad Cash\ balance = \frac{Cash}{Total\ Assets} \quad (3)$$

We construct a joint measure of the variables net leverage and cash balance to determine whether a firm is financially constrained or not. We do this by ranking the firm-year observations into deciles, separately for the two measures, within each year and industry. Each

decile gets a score between one and ten. We multiply cash balance by minus one before ranking so that, as for leverage, it is increasing with the likelihood of being financially constrained. Firms with the value of 10 are firms with the lowest cash balance, respectively the firms with the highest level of net leverage. We then take the average of these two variables to create a constraint score for each firm-year, within each industry. We then follow Linck, Netter & Shu (2013) and classify the top 30 percent of the firm-year observations with the highest constraint score, as financially constrained, and the rest as financially unconstrained. We evaluate the validity of this classification in the discussion.

4.3 Estimation of discretionary accruals

To estimate discretionary accruals, we use the performance adjusted model developed by Kothari, Leone & Wasley (2005). For robustness, we also measure discretionary accruals with the widely used Modified Jones model developed by Dechow, Sloan & Sweeney (1995). To understand the performance adjusted model, we first give an explanation of the Modified Jones model, which follows below.

4.3.1 The Modified Jones model

The Modified Jones model is a model developed by Dechow, Sloan & Sweeney (1995) and is an extension of the original Jones model developed by Jones (1991). Although the Jones model is successful in explaining part of the changes in total accruals, it does have some drawbacks. The model assumes that revenues are completely non-discretionary. This assumption leads to an understatement of the extent of earnings management when earnings are managed through discretionary revenues. The Modified Jones model relaxes this assumption and achieves a better explanatory power of non-discretionary accruals.

Discretionary accruals are estimated by running a regression on total accruals, see *Equation 4,* controlling for factors known to affect non-discretionary accruals. The regression is run cross-sectionally on an industry-year level, meaning that the estimation of discretionary accruals is done separately within each year and industry. The residuals of the regression captures discretionary accruals for each observation. This is the part of total accruals that is not expected when considering a firm's ordinary business activities, and is therefore considered to be the result of management discretion. The Modified Jones Model is presented below:

$$\frac{TA_{it}}{A_{it-1}} = \beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{\Delta Rev_{it} - \Delta Rec_{it}}{A_{it-1}} + \beta_3 \frac{PPE_{it}}{A_{it-1}} + \varepsilon_{it} \quad (4)$$

where

TA_{it} = Total accruals for firm i in year t, calculated as net income minus cash flow from operations

A_{it-1} = Total assets for firm i at the beginning of year t

ΔRev_{it} = Change in revenues for firm i between year t and t minus one

ΔRec_{it} = Change in accounts receivable for firm i between year t and t minus one

PPE_{it} = Property, plant & equipment for firm i in year t

ε_{it} = The residual that captures discretionary accruals for firm i in year t

We have chosen to use the Modified Jones model for robustness because despite its weaknesses, as will be discussed below, it is a model shown to detect earnings management to a high degree. Up until this date it has been the most widely used model to estimate discretionary accruals.

4.3.2 The Performance adjusted model

It is proven by earnings management literature (Dechow et al., 1995; Kothari et al., 2005) that firm-years with high earnings tend to have higher levels of accruals. Many models, including the Modified Jones model, fail to adjust for this relationship, which leads to the creation of type one errors. Type one errors occur when the null hypothesis, stating that earnings are not systematically managed, is rejected when in fact the null is true. The performance matched model, by Kothari, Leone & Wasley (2005), has taken this problem into account and the model is shown to reduce the extent of type one errors. To avoid these types of errors, we choose to measure discretionary accruals following this model.

Kothari, Leone & Wasley (2005) show that the model that best captures discretionary accruals is when using either the Jones model or the Modified Jones model to estimate discretionary accruals and then adjust for a performance-matched firm's discretionary accrual. This is done by dividing firms into portfolios based on industry and return on assets. Following our reasoning in section 4.3.1 we use the Modified Jones model as a basis when estimating discretionary accruals for each firm-year. The performance matching method previously described is preferred when using this model, because the relationship between return on assets and accruals is not linear. However, there is an alternative way to receive similar results, adding return on assets as a variable to the Modified Jones model (Kothari et al., 2005). We use this alternative method when estimating discretionary accruals with the model developed by Kothari, Leone & Wasley (2005), and refer to it as the performance adjusted model. The reason for this is that the first method described is difficult to execute in practice.

When incorporating return on assets in the regression, either opening- or closing balance values of the variable can be used. Adjusting discretionary accruals based on return on assets calculated with closing balance values has proved to provide better results and we therefore follow this approach, see *Equation 5*, (Kothari et al., 2005). The performance adjusted model of our choice is presented below.

$$\frac{TA_{it}}{A_{it-1}} = \beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{\Delta Rev_{it} - \Delta Rec_{it}}{A_{it-1}} + \beta_3 \frac{PPE_{it}}{A_{it-1}} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (5)$$

Where

TA_{it} = Total accruals for firm i in year t, calculated as net income minus cash flow from operations

A_{it-1} = Total assets for firm i at the beginning of year t

ΔRev_{it} = Change in revenues for firm i between year t and t minus one

ΔRec_{it} = Change in accounts receivable for firm i between year t and t minus one

PPE_{it} = Property, plant & equipment for firm i in year t

ROA_{it} = Return on assets for firm i in year t

ε_{it} = The residual that captures discretionary accruals for firm i in year t.

Just like with the Modified Jones model, this regression is run cross-sectionally on an industry-year level where the residual captures the discretionary part of total accruals. The result obtained from this method shows that firms with abnormally high or low levels of accruals, manage their earnings more than what would be expected based on their level of return on assets.

4.3.3 Absolute or non-absolute discretionary accruals

In this study, we use non-absolute, as opposed to the alternative of absolute discretionary accruals. When using discretionary accruals in statistical tests, both absolute and non-absolute values of discretionary accruals can be used. The choice between the two alternatives depends on what is of interest to examine. If using absolute values, the model will capture the effects of managing earnings in both directions, but without knowing which direction earnings are managed. This method is often used when investigating the presence of discretionary accruals. If using non-absolute values, interpretations can be made of whether earnings are managed upwards or downwards. In our study, we are interested in looking at non-absolute discretionary accruals since we want to examine the effect of increasing levels of discretionary accruals on external financing and investment.

4.3.4 Cash flow- or balance sheet approach

To calculate total accruals, the cash flow from operations component can be collected from either the cash flow statement or calculated indirectly with the balance sheet approach. Estimating accruals through the balance sheet approach can be subject to measurement errors which can affect the results of the level of discretionary accruals (Hribar & Collins, 2002). The balance sheet approach has been found to be biased due to the inclusion of non-operating activities like mergers & acquisitions and discontinued operations. With reference to these findings, we measure total accruals directly from the statement of cash flows, thereby using the cash flow approach.

4.3.5 Time series- or cross sectional approach

The estimation of discretionary accruals can be done with two different methods, the time-series approach and the cross-sectional approach. These methods are similar in the way that they both estimate total- and non-discretionary accruals, and subtract non-discretionary accruals from total accruals. However, the time-series approach estimates non-discretionary accruals by analyzing variations in total accruals over a longer time period (McNichols, 2002), while the cross-sectional approach compares total accruals between all available firms in an industry at a specific point in time (Dechow et al., 1995). The time series approach requires substantial amounts of data from a long time period. For example, Jones (1991) uses a pre-event window of 14 years. This makes the model difficult for us to use due to limitations in data availability. In addition, in line with Dechow, Sloan & Sweeney (1995), we expect non-discretionary accruals to be industry specific. Therefore, we use the cross-sectional approach, which has also become the most widely used method in recent years.

4.4 The Regression Models

We conduct two separate regression models for the two hypotheses. Both regressions are performed with panel data, meaning that each regression incorporates all firms included in our sample over all years available. We conduct our regressions using the ordinary least squares (OLS) model and include dummy variables for both industry and year which gives the regression model both industry and year fixed effects. In an OLS regression, the assumption that the error terms are uncorrelated to the independent variables must hold, or the coefficients will be biased. Therefore, we include industry fixed effects in the model because firms in different industries are assumed to operate in industry-specific conditions which could affect the independent variables. The industry fixed effects neutralize these kinds of unobserved effects. We control for year effects because unexpected variation or special events over time

could otherwise affect the dependent variable. When categorizing firms into different industries we use the GICS industry sector code. We adjust the standard errors for heteroskedasticity in both regressions.

4.4.1 Hypothesis 1

In our first hypothesis, we test whether financially constrained firms with good investment opportunities have higher levels of discretionary accruals, compared to their unconstrained counterparts. We also test whether discretionary accruals increase with the level of subsequent investment for financially constrained firms. The regression model, presented in *Equation 6*, allow us to test these empirical predictions.

$$DisAccr_{it} = \beta_0 + \beta_1 Constraint_{it} + \beta_2 Investment_{it+1} + \beta_3 Constraint_{it} * Investment_{it+1} + \beta_4 Salesgrowth_{it} + \beta_5 BTM_{it} + \beta_6 CFO_{it} + \beta_7 Size_{it} + \varepsilon_{it} \quad (6)$$

$DisAccr_{it}$ represents the level of discretionary accruals for firm i in year t. The coefficient β_0 is the intercept and represents the average level of discretionary accruals, for firms classified as unconstrained, when all independent variables equal zero. The coefficient β_1 will tell us how the level of discretionary accruals is affected if a firm is constrained. The coefficient β_2 indicates how the level of discretionary accruals changes with investment in the subsequent period and β_3 will tell us if this relationship is different for firms classified as constrained compared to unconstrained firms. The remaining coefficients in the regression model, β_i, indicate the effect of each control variable on discretionary accruals, and ε_{it} is the residual from the regression for firm i in year t.

$Constrained_{it}$ is a dummy variable taking the value one if a firm is classified as financially constrained in year t, and zero otherwise. As previously mentioned these are the top 30 percent of the firm-year observations with the highest level of net leverage and lowest cash balance. We hypothesize that constrained firms will be more motivated to use discretionary accruals since previous research (e.g. Linck et al 2013) has found that financially constrained firms have higher levels of discretionary accruals than unconstrained firms. We would therefore expect the coefficient of this variable, β_1 to be positive.

$Investment_{it+1}$ is investment for firm i in year t plus one. In line with previous studies (e.g. Zhang, 2009) it is measured as the sum of capital expenditure and research & development expenses, scaled by lagged total assets. Based on findings by previous literature (McNichols &

Stubben, 2008; Linck et al., 2013), we would expect this variable to have a positive correlation with discretionary accruals.

$Constrained_{it} * Investment_{it+1}$ is an interaction term between the dummy variable $Constrained_{it}$ and $Investment_{it+1}$ which shows whether the effect of investment on discretionary accruals is different for constrained firms compared to unconstrained firms. We would expect this variable to be positive since we hypothesize that constrained firms are in greater need of external financing, to enable investments, and will therefore have higher levels of discretionary accruals prior to investment.

$Salesgrowth_{it}$ indicates the sales growth of firm i in year t and is measured as the change in sales between year t and year t minus one. Prior studies have shown that growth firms have stronger incentives to manage earnings (McNichols, 2002; Skinner & Sloan, 2002) and therefore, we expect the variable to be associated with higher discretionary accruals.

BTM_{it} indicates a firm's book-to-market ratio in year t, and is defined as the book value of equity scaled by the market value of equity. A lower value of BTM corresponds to higher growth. Skinner & Sloan (2002), find that low book-to-market firms are more sensitive to fluctuations in earnings, meaning that these firms will have stronger incentives to use discretionary accruals. Therefore, we expect the variable to be associated with lower discretionary accruals.

CFO_{it} is a firm's cash flow from operations in year t and is defined as net cash flow from operations scaled by the beginning of year total assets. Dechow, Sloan & Sweeney (1995) found evidence of discretionary accruals being dependent on operating cash flows. When operating cash flows are high, managers tend to decrease earnings and vice versa. We therefore expect the coefficient to have a negative correlation with discretionary accruals.

$Size_{it}$ indicates a firm's size in year t and in line with Zhang (2009), it is measured as the natural logarithm of the sum of a firm's market value of equity and book value of debt. Prior research has found that market capitalization is related to discretionary accruals (Watts & Zimmerman, 1978; Klein, 2002). In general, investors and financial analysts are more involved in larger firms. Therefore, the coefficient is expected to have a negative correlation with discretionary accruals.

The null hypothesis of hypothesis 1a states that there is no difference in the level of discretionary accruals between financially constrained and unconstrained firms. The alternative hypothesis states that financially constrained firms have higher levels of discretionary accruals than unconstrained firms, which would imply a positive value of the coefficient β_1.

$$H_0: \beta_1 = 0, \qquad H_1: \beta_1 > 0$$

The null hypothesis of hypothesis 1b states that investment in the subsequent period does not have an impact on the level of discretionary accruals for financially constrained firms. The alternative hypothesis states that higher investment in the subsequent period is associated with higher levels of discretionary accruals for constrained firms, which would imply a positive value of the coefficient β_3.

$$H_0: \beta_3 = 0 \qquad H_1: \beta_3 > 0$$

4.4.2 Hypothesis 2

After testing our first hypothesis, we continue by testing our second hypothesis. We now exclude firms classified as financially unconstrained and investigate the effect of discretionary accruals on external financing for financially constrained firms with good investment opportunities, using the regression model presented in *Equation 7*:

$$ExFin_{it+1} = \beta_0 + \beta_1 DisAccr_{it} + \beta_2 Size_{it} + \beta_3 BTM_{it} + \beta_4 Tangibility_{it} + \beta_5 ROA_{it} + \varepsilon_{it} \quad (7)$$

$ExFin_{it+1}$ is the dependent variable of the regression and represents the external financing obtained by firm i in year t plus one. The coefficient β_0 is the intercept and represents the average level of external financing for financially constrained firms, when all independent variables equal zero. The coefficient β_1 will tell us how the level of discretionary accruals affects external financing obtained. The remaining coefficients, β_i, indicate the effect of each control variable on external financing and ε_{it} is the residual from the regression for firm i in year t.

To derive the measure of external financing we follow Bradshaw, Richardson & Sloan (2006) and use information provided in the statement of cash flows. External financing equals the sum of cash flows from the sale of equity plus cash flows from the proceeds of long-term debt plus cash flows from the change in current debt, scaled by lagged total assets. We measure external financing one year after we measure discretionary accruals since we want to examine how external financing is affected by the use of discretionary accruals.

$DiscAccr_{it}$ is our explanatory variable of interest and indicates the level of discretionary accruals for firm i in year t. As stated in the hypothesis, we expect firms with higher discretionary accruals to obtain more external financing. Therefore, we expect the sign of the coefficient of discretionary accruals to be positive.

$Size_{it}$ is the size of firm i in year t and just like in the prior regression it is measured as the natural logarithm of the sum of a firm's market value of equity and book value of debt. Size is included as a control variable since smaller firms are less likely to suffer from asymmetric information than do larger firms (Rajan & Zingales, 1995). If financially constrained firms with good investment opportunities suffer from more information asymmetries, we would expect external capital providers to be more cautious in investing in the firm. Consequently, we expect the coefficient for size to be negative.

BTM_{it} is the book-to-market ratio of firm i in year t and is calculated as the ratio of a firm's book value of equity to its market value of equity. With the book-to-market ratio we control for growth in line with Ritter (2003), who states that issuing firms tend to be growth firms. As growth firms have low book-to-market values, we expect the coefficient to be negative.

$Tangibility_{it}$ indicates the tangible assets of firm i in year t. It is defined as the book value of property, plant and equipment, scaled by total assets. Prior research (Rajan & Zingales 1995) has found that tangible assets are easier to price, reduce agency costs and are related to lower information asymmetries. Therefore, higher tangibility is expected to be associated with higher levels of external financing.

ROA_{it} is return on assets for firm i in year t and is calculated as net income scaled by lagged total assets. As with the measure of book-to-market, we control for internal growth through return on assets and expect the variable to have a positive relationship with external financing.

The null hypothesis of hypothesis 2 states that there is no relationship between discretionary accruals and external financing. The alternative hypothesis states that the relationship between discretionary accruals and external financing is positive, which would imply a positive value of the coefficient β_1.

$$H_0: \beta_1 = 0, \qquad H_1: \beta_1 > 0$$

4.5 Empirical data

In this section, we will present the method used for selecting our sample and how we gathered the data. We then present Pearson correlations for the variables in our regression models.

4.5.1 Sample selection and data collection

We begin our data collection by selecting Swedish listed firms from Nasdaq Stockholm, collecting an initial sample of 342 listed firms (Nasdaq Nordics, 2017). The time period chosen for our observations is limited to 2007-2015 since the database Retriever Business only provides accounting information from the year 2007 and does not yet provide financial reports for the year 2016. Our study requires one year of leading, and one year of lagging data, corresponding to a time period of three consecutive years. This means that a firm needs to have been listed on Nasdaq Stockholm for a minimum of three years to be incorporated in the sample. Therefore, we remove firms listed after 2013 and add firms delisted after 2010 to the sample. In our sample, we exclude financial firms (GICS code 40) as these firms have a different investment policy and capital structure than firms in other industries, which would affect the estimation of discretionary accruals.

To compute non-discretionary accruals with a cross sectional approach, we need firms to be part of a GICS industry with enough firm-year observations. We follow previous research (e.g. Kothari et al., 2005) and exclude firms belonging to an industry with less than 10 observations per year. Firms that do not meet this requirement are firms in the industry Materials (GICS code 15). We make an exception for the industry Consumer Goods, and include it in the sample even though it only has nine observations in year 2011. From this sample, we only include firm-years with available data on accruals, financial constraint measures and measures of external financing and investment for the period 2007-2015. Lastly, we exclude observations with a Tobin's Q below the value of one, which leads us to drop 305 firm-year observations. We exclude these firms since we are only interested in the effects of discretionary accruals on firms which, according to the measure of Tobin's Q, should increase their investments. To avoid endogeneity problems, we measure Tobin's Q by one year before both discretionary accruals and all control variables. The final sample consists of 173 firms from five different GICS sectors, totaling 930 firm-year observations. See table 1 and table 2 for sample distributions. To obtain financial information for estimating discretionary accruals, we use Retriever Business. Thompson Reuters Datastream is used to obtain data on capital expenditures and cash flow from operations. Data on external financing is manually collected from annual reports.

Table 1.

Sample distribution accross industries

Sector code	Industry	Firms	Observations
20	*Industrials*	*69*	**377**
25	*Consumer Services*	*24*	**120**
30	*Consumer Goods*	*22*	**109**
35	*Health Care*	*28*	**153**
45	*Information technology*	*30*	**171**
	Total	**173**	**930**

Table of sample distribution, firms and observations, across industries. Industry categorization is done according to the Global Industry Classification Standard (GICS).

Table 2.

Sample distribution across years and industies

Sector code	Industry	2009	2010	2011	2012	2013	2014	2015	Total
20	*Industrials*	61	55	36	55	55	56	59	**377**
25	*Consumer Services*	17	19	12	17	19	18	18	**120**
30	*Consumer Goods*	16	17	9	15	18	16	18	**109**
35	*Health Care*	21	21	20	22	21	23	25	**153**
45	*Information technology*	24	24	19	24	26	26	28	**171**
	Total	**139**	**136**	**96**	**133**	**139**	**139**	**148**	**930**

Table of sample distribution across years and industries. Industry categorization is done according to the Global Industry Classification Standard (GICS).

4.5.2 Data processing

Before performing the regressions, some adjustments are made to our data set. We replace all observations with negative values of external financing with zero, since a negative value of external financing implies that a firm has repaid more capital than it has obtained. As the presence of outliers can impact the results, all variables, except for size, is winsorized at the 1st and 99th percentiles. Finally, we multiply the values of all variables by 100.

4.5.3 Pearson correlations

In Appendix 1 we present the Pearson correlations between our dependent and independent variables. We expect the correlation between discretionary accruals, calculated with the performance adjusted model and the Modified Jones model, to be highly correlated since both variables represent estimations of discretionary accruals measured with slightly different methods. We also expect the majority of the explanatory variables to be correlated with our dependent variables, discretionary accruals and external financing. This would indicate that the

explanatory variables explain some of the variation in the dependent variables. Further, we do not expect the explanatory variables to be highly correlated with each other as this would indicate multicollinearity.

Regarding the correlation between the two discretionary accruals measures, the results from the Pearson correlation analysis are in line with our expectations as the variables show a high correlation of 0.85. We see that many of the explanatory variables used to test our first hypothesis; cash balance, cash flow from operations, sales growth, book-to-market and size, are significantly correlated with the performance adjusted discretionary accruals measure. The explanatory variables; investment and leverage, are not significantly correlated with the performance adjusted discretionary accruals measure. In the regression used to test our second hypothesis, all explanatory variables except for discretionary accruals have a significant correlation with external financing. The correlation results do not control for differences in firm and industry characteristics. Hence, we cannot not draw any conclusions solely based on the Pearson correlations. This will be controlled for in our main regressions. We do not find that there is high correlation between any of the explanatory variables used in each regression, indicating that there is not a problem with multicollinearity. However, to increase the certainty of there not being multicollinearity, we perform a VIF test, presented in section 6.4.2.

5. Results

In this section, we present the results from testing our two hypotheses. The analysis and the discussion of our results follow in section 6.

5.1 Hypothesis 1

In the regression used to test our first hypothesis we begin by examining whether financially constrained firms with good investment opportunities have higher levels of discretionary accruals than their unconstrained counterparts. We further examine whether the relationship between discretionary accruals and investment in the subsequent period is positive for financially constrained firms. The results from the regression is presented in table 3. The R-squared for the regression is 0.1283, indicating that the independent variables explain 12.8 percent of the variation in the dependent variable.

The coefficient of the dummy variable “Constrained” is positive, but not significant. This gives an indication that the level of discretionary accruals is higher for financially constrained firms than for unconstrained firms, but we cannot reject the null hypothesis of hypothesis 1a,

(H_0: $\beta_1 = 0$). Therefore, we cannot conclude that financially constrained firms engage more in strategic accrual reporting, compared to unconstrained firms. The coefficient for investment is also positive, but not significant. The interaction term between constrained and investment is used to show how the effect of investment on discretionary accruals differs between constrained and unconstrained firms. Our interaction term is negative and not significant. This means that we cannot reject the null hypothesis of hypothesis 1b, (H_0: $\beta_3 = 0$). These results indicate that, for financially constrained firms with good investment opportunities, we cannot conclude that investment in the subsequent period has an impact on the level of discretionary accruals. Two of the control variables, cash flow from operations and size, are significant. All variables except for book-to-market have the expected sign of their coefficients.

Table 3.

Discretionary accruals and finacial constraints

Dependent variable = Discretionary accruals

Variable	**Coefficients**	**Std error**	**t-statistics**	**P-value**
Intercept	28.094 *	16.190	1.74	0.083
Constrained	4.733	5.051	0.94	0.349
Investment	0.251	0.284	0.88	0.378
Constrained*Investment	-0.482	0.633	-0.76	0.447
Salesgrowth	0.038	0.029	1.30	0.193
BTM	0.062	0.077	0.81	0.415
CFO	-0.595 ***	0.150	-3.98	0.000
Size	-1.966 **	0.945	-2.08	0.038
Year fixed effects	Yes			
Industry fixed effects	Yes			
Observations	930			
R-squared	0.1283			

The table presents the results from an OLS regression of discretionary accruals on a constraint measure and on subsequent investments, for firms with good investment opportunities. The dependent variable is discretionary accruals calculated with the performance adjusted model. The independent variables include constrained, investment and an interaction term between the two. Constrained is a binary variable, based on net leverage and cash balance, taking the value one when a firm is constrained. Investment is calculated one year ahead of the remaining variables. The control variables include sales growth, book-to-market, cash flow from operations and size. All variables, except for constrained and size, are winsorized at the 1st and 99th percentiles. The regression is estimated with year fixed effects and industry fixed effects. Robust standard errors are reported in the second column.
Significance levels: *** p<0.01, ** p<0.05, * p<0.1

5.2 Hypothesis 2

To test our second hypothesis, whether discretionary accruals ease financial constraints, we run a regression investigating the relationship between external financing and discretionary

accruals for financially constrained firms with good investment opportunities. The results from the regression are presented in table 4. The R-squared for the regression is 0.1569, indicating that 15.7 percent of the variation in the dependent variable, external financing, is explained by the independent variables. The coefficient of discretionary accruals is slightly negative but not significant. We are not able to reject the null hypothesis (H_0: $\beta_1 = 0$), meaning that we cannot conclude that discretionary accruals have an impact on subsequent external financing obtained by a firm. The coefficients of all control variables are negative, but only the coefficient for tangibility and return on assets are significant at the 0.1 respectively 0.05 level.

Table 4.

External financing and discretionary accruals

Dependent variable = External Financing

Variable	**Coefficients**	**Std error**	**t-statistics**	**P-value**
Intercept	12.071 **	5.571	2.17	0.031
Discretionary Accruals	-0.011	0.012	-0.91	0.365
Size	-0.363	0.311	-1.17	0.245
BTM	-0.033	0.021	-1.55	0.122
Tangibility	-0.083 *	0.046	-1.81	0.072
ROA	-0.355 **	0.142	-2.50	0.013
Year fixed effects	Yes			
Industry fixed effects	Yes			
Observations	284			
R-squared	0,1569			

The table presents the results from an OLS regression of external financing on discretionary accruals, for financially constrained firms with good investment opportunities. The classification of constrained firms is based on net leverage and cash balance. The dependent variable is external financing, calculated one year ahead of the independent variables. The independent variable is discretionary accruals calculated with the performance adjusted model. The control variables include size, book-to-market, tangibility and return on assets. All variables, except size, are winsorized at the 1st and 99th percentiles. The regression is estimated with year fixed effects and industry fixed effects. Robust standard errors are reported in the second column. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

6. Discussion

In this section, we begin by presenting conditional analyses using alternative measures of discretionary accruals and financial constraints. We then proceed to analyze the results of our empirical tests, followed by a discussion of our research method. We end this section by presenting robustness tests.

6.1 Conditional analysis

6.1.1 The Modified Jones model to estimate discretionary accruals

There are several models developed to estimate discretionary accruals, and as explained in section 2.2.7, they all have their strengths and weaknesses. Therefore, we propose a conditional analysis, using the Modified Jones model developed by Dechow, Sloan & Sweeney (1995) to estimate discretionary accruals. We perform the same regressions as with our main tests. The results from these regressions are presented in panel A and panel B of Appendix 2. The regression of hypothesis 1 provides quite similar results to the ones received from the regression using the performance adjusted model. The coefficient for constrained is still positive and insignificant, meaning that we cannot reject the null of hypothesis 1a. The same holds for the coefficient of investment. The coefficient for the interaction term between constrained and investment is negative and significant at the 0.1 level with the Modified Jones model. In the main test, this coefficient is negative but not significant. The negative sign of the coefficient in both tests provides evidence for that we cannot reject the null hypothesis of 1b.

The signs of the coefficients and the significance levels received from the regression of hypothesis 2, using the Modified Jones model, are the same as when using the performance adjusted model. The explanatory variable, discretionary accruals, is slightly negative but not significant, indicating that the degree of discretionary accruals does not seem to have a considerable impact on external financing. We cannot reject the null of hypothesis 2. The fact that the results from our conditional analysis, using the Modified Jones model, are similar to the ones received when using the performance adjusted model indicates that the choice of method used to estimate discretionary accruals has not had a large impact on our results.

6.1.2 Cash flow from operations as a measure of constraint

The measures used to classify firms as constrained are net leverage and cash balance. The decision to use these measures as a basis for the classification of a firm being financially constrained, has likely had an impact on our results. There might be a risk that we have excluded other relevant measures that could be better proxies for whether a firm is financially constrained. Previous studies have found several factors that can be used to classify a firm as constrained, such as cash flow measures estimating a firm's overall profitability and its ability to generate internal funds (Kaplan & Zingales, 1997). Low levels of cash flow from operations can affect firms' financing possibilities as Bowen, Burgstahler & Daley (1987) argue that cash flow from operations is a signal about firm liquidity.

We propose to test our hypotheses using an alternative measure of financial constraints by replacing our previous constraint-score with a new score based on cash flow from operations. We do this by ranking the firm-year observations between the value of 1 and 10 within each year and industry. Firms with the highest constraint score are firms with the lowest level of cash flow from operations. We follow Linck, Netter & Shu (2013) and create a new binary variable which classifies an observation as financially constrained if it is in the top 30 percent of the firm-year observations with the highest constraint score. In the main test of hypothesis 1 we included cash flow from operations as a control variable. In the conditional analysis we replace this variable with our previous constraint measures, controlling for net leverage and cash balance.

The results from the regressions, using cash flow from operations to classify firms as constrained, are presented in panel A and panel B of Appendix 3. The results are similar to the ones presented in the original tests but with a few differences. In the regression to test our first hypothesis, the coefficient of the variable constrained is positive, but unlike in the original test it is now significant at the 0.1 level. This implies that we can reject the null of hypothesis 1a in the conditional analysis, that the level of discretionary accruals is higher for financially constrained firms than for unconstrained firms. The coefficient of investment is positive but not significant, as found with the main tests. The interaction term between investment and constrained is positive but not significant, meaning that we cannot draw any conclusions of a significant relationship regarding hypothesis 1b. The results received from our test of the second hypothesis show that the coefficient of discretionary accruals is positive but close to zero, and not significant. Therefore, we cannot reject the null of hypothesis 2, which was also the case with the original test.

6.2 Analysis of results

Hypothesis 1 - In the first hypothesis, we examined whether financially constrained firms with good investment opportunities have higher levels of discretionary accruals, compared to unconstrained firms. We then proceeded to investigate whether discretionary accruals increase with the level of investment in the subsequent period for financially constrained firms with good investment opportunities.

Based on our results, we cannot with certainty conclude that constrained firms have higher levels of discretionary accruals than unconstrained firms. However, we find indications of a relationship based on the fact that the coefficient of the variable constrained is positive but not

statistically significant. The results from our conditional analysis further strengthens this indication. In the conditional analysis where we measured financial constraints based on cash flow from operations, we find a statistically significant relationship which shows that constrained firms have higher discretionary accruals than unconstrained firms. As only one of our three tests shows a significant relationship, we cannot conclude that a relationship is existing. One interpretation of why only the test with cash flow from operations as the constraint measure is significant, is that firms with low cash flows might have other incentives behind inflating earnings through discretionary accruals than raising external capital to signal positive future prospects. For example, one explanation could be the desire to reach the level of earnings in earnings forecasts or to meet requirements in contractual agreements (Watts & Zimmerman, 1978). Our tests provide us with lack of support of a statistically significant difference in the level of discretionary accruals for constrained firms compared to unconstrained firms. Therefore, we cannot confirm that the findings of Linck, Netter & Shu (2013), who present statistically significant evidence of constrained firms having higher discretionary accruals, are also prevalent in Swedish firms.

Linck, Netter & Shu (2013) further conclude that the level of discretionary accruals for constrained firms increases as both investment opportunities and subsequent investments rise. We have not been able to conclude that this relationship is existent for financially constrained Swedish listed firms. This implies that our findings are not in line with the theory that discretionary accruals can be used as a signal prior to investment for constrained firms with good investment opportunities. Our results can also be compared with the ones proposed by McNichols & Stubben (2008) who find that misreporting firms with high discretionary accruals invest more during the misreporting period which leads them to over-investment, a relationship we cannot observe in our results.

Hypothesis 2 - In the second hypothesis, we limited our sample to only include financially constrained firms. We tested whether higher levels of discretionary accruals can ease financial constraints and hypothesized that the relationship between discretionary accruals and external financing is positive. The results show that the variable of interest, discretionary accruals, is somewhat negative and not significant. Contrary to the findings of many U.S. studies (e.g. Teoh et al., 1998a; Teoh et al., 1998b; Teoh, Wong & Rao 1998; Linck et al., 2013) we do not find support for the fact that financially constrained firms can use discretionary accruals to signal positive investment opportunities enabling them to obtain external financing.

When performing our tests, we could not confirm a statistically significant relationship between the dependent variables and the variables of interest in any of our hypotheses. These results are contradictory from the ones presented by previous studies (e.g. Linck et. al., 2013; McNichols & Stubben, 2008; Biddle & Hilary, 2006). One possible explanation of the failure to reject our null hypotheses could be the differing governance factors between Swedish and U.S. firms, with possible higher information asymmetries in U.S. firms. The ownership structure in Swedish firms differs from U.S. firms, with ownership in the Swedish market being concentrated to a small number of large shareholders, as opposed to a more diverse ownership structure in the U.S. (Swedish Corporate Governance Board, 2016).

Astami & Tower (2006) state that firms with high controlling ownership are more likely to have more active owners with greater insight in the firm, which has an impact on information asymmetries between managers and shareholders. In Sweden, controlling shareholders are more active, they have more influence and are more engaged in firm decisions by, for example, being board members. Larger shareholders in Sweden are also expected to obtain more information from private channels, thereby being more efficient in monitoring management. As a more concentrated ownership structure is expected to align incentives between managers and shareholders, decisions regarding investment and external financing are more likely to be influenced by the incentives of controlling owners. Additionally, Sweden can be compared to the Japanese market where banks and consortiums are important sources of financing. Information asymmetries are argued to be lower in these markets since these economies have alternative ways of reducing information asymmetries. (Shleifer & Vishny, 1997; Biddle & Hilary, 2006; Swedish Corporate Governance Board 2016). Given that information asymmetries are lower between managers and shareholders in Sweden, as a result of higher monitoring, it could possibly explain why we could not find results of a relationship between discretionary accruals and corporate investment decisions.

6.3 Discussion of research method

6.3.1 Estimating investment opportunities

Our results may be contingent on the accuracy and reliability of measuring investment opportunities, as our sample only includes firms with good investment opportunities.

In this study, we estimate investment opportunities with Tobin's Q, which indicates a firm's average investment efficiency. There are several other methods to measure investment opportunities, for example marginal q. The central difference between marginal q and Tobin's

Q is that the latter measures the average investment efficiency in relation to all investments made during the entire lifetime of a firm, whereas marginal q measures the investment efficiency during a certain time-period of interest (Mueller & Reardon, 1993).

Using Tobin's Q as a proxy for investment opportunities can be suspected to cause problems of endogeneity, as the measure does not capture yearly changes in investment efficiency. As marginal q takes current investments into consideration, by calculating marginal investment efficiency, it might be a more suitable proxy for investment opportunities when studying investment decisions in a firm.

6.3.2 Estimating financial constraints

The proxies used to classify firms as financially constrained are likely to have had impact on our results. There is a possibility that high leverage and low cash balance does not actually reflect a firm's financial position and need of external funds to enable investments. For example, high leverage does not necessarily suggest that a firm is in financial distress, as there could be situations where a firm is highly levered in order to take advantage of the benefits of leverage. In this case, leverage might be an indication that the firm is healthy and can take on a higher degree of leverage. Further, firms might have different dependencies for leverage in certain stages of their life cycle. Another aspect regarding highly levered firms that we need to take into account when interpreting our results, is that high leverage could increase the risk of financial distress (Myers, 1977). Chaney and Lewis (1995) argue that firms will use discretionary accruals only if the benefits exceed the costs, and for firms in risk of bankruptcy the risks might be too high for management to manage earnings through discretionary accruals. Moreover, if a firm is in financial distress it is not presumed to be in position to invest, and investors most likely will refrain from providing capital.

Furthermore, there could be issues connected to using cash balance as a proxy for financial constraints. A firm anticipating that it might be financially constrained in the near future, might want to hold on to cash and refrain from investing with the level of new cash flows. In line with this argument, as firms with higher level of cash holdings could also be constrained, there is a risk that we have not captured all firms that actually are financially constrained in our classification. Therefore, using cash balance as a proxy for financial constraints should be interpreted with caution as firms differ in their optimal cash policies and growth opportunities.

6.3.3 Measuring discretionary accruals

As previously mentioned, several methods for estimating discretionary accruals have been developed over the years. However, many accrual-based models estimating the degree of discretionary accruals have been criticized. McNichols (2000) emphasizes that it is extremely difficult to tell how accruals fluctuate without the discretion of managers' judgement, which makes it hard to be confident in the estimation of discretionary accruals. A problem with accrual-based models is the difficulty to isolate the discretionary part of total accruals, which often results in low significance levels (Dechow et al., 2012). However, recent models have become better at coping with this problem, but it is difficult to entirely eliminate it. Young (1999) emphasizes that there might be several factors that are omitted in accrual-based models attempting to estimate the level of non-discretionary accruals. He finds that several models produce measurement errors when not controlling for cash flow performance, sales growth and asset structure.

In our regressions using both the performance adjusted model by Kothari, Leone & Wasley (2005) and the Modified Jones model by Dechow, Sloan & Sweeney (1995), we present equivalent results. It is hard to tell which one of the proxies for discretionary accruals that best reflects the discretion made by managers. There are several studies (e.g. Francis et al., 2008; Kothari et al., 2005) that advocate for the use of including return on assets as a control variable in the regression when estimating non-discretionary accruals. As previously mentioned, accruals are shown to have a correlation with earnings and if not adjusting for return on assets, discretionary accruals are easily overstated when firms experience extreme performance (Dechow, 1995; Kothari et al., 2005). Consequently, we can assume that the performance adjusted model will leave us with more accurate results, but we cannot know this for sure.

6.3.4 Sample bias

In the sample selection, there are a number of firm-year observations filtered out. First, we excluded financial firms since these firms have a very different capital structure compared to firms in other industries. We also excluded observations with missing data. Further we excluded firms not belonging to a GICS group with at least 10 firm-year observations within an industry. We winsorized all variables at the 1^{st} and 99^{th} percentile. It is possible that these adjustments have had an impact on our results since valuable and relevant data might have been filtered out. When running our regression for the second hypothesis, we excluded all firm-year observations not classified as having good investment opportunities and observations classified as financially unconstrained. This left us with 284 firm-year observations out of the total 930. It is likely that

the classification of firms into separate groups has had a large impact on the regression outcome, something we need to keep in mind when interpreting the results.

6.4 Robustness test

6.4.1 Heteroskedasticity

An assumption that needs to hold for an OLS regression to present reliable results is that the error terms must be homoscedastic. If this assumption is violated, the regression has a problem with heteroskedasticity, which means that the variance of the standard errors is not constant across all values of the independent variables. Due to biased estimates of the residuals this can lead to incorrect conclusions about the significance level of the coefficients of the independent variables (Cohen et al., 2002). The majority of our variables are scaled by lagged assets, which is intended to mitigate heteroskedasticity, but it does not eliminate it (White, 1980). We therefore test our regression models for heteroskedasticity by conducting a White's test. The null hypothesis states that the variance of the standard errors is constant (homoscedastic), against the alternative hypothesis stating that the variance is different across the observations. The results are presented in Appendix 4. For the sample used in the first regression, with discretionary accruals as the dependent variable, we can reject the null hypothesis of homoscedasticity with a $\chi^2{}_{obs}$ of 521.85 and p-value of 0.000. We observe the same results when testing for heteroskedasticity using the Breusch Pagan Cook-Weisberg test (BP-test) with $\chi^2{}_{obs}$ of 602.22 and p-value of 0.000. For our second regression, we excluded firms classified as unconstrained and used different independent variables. Therefore, we need to conduct a heteroskedasticity test for the second regression as well. For the second regression, we can reject the null hypothesis of homoscedasticity, with a $\chi^2{}_{obs}$ of 131.17 and p value of 0.037 when conducting the White's test and a $\chi^2{}_{obs}$ of 284.49 and p value of 0.000 with the BP test. We conclude that both samples are heteroskedastic and we therefore use robust standard errors when conducting the regressions.

6.4.2 Multicollinearity

Multicollinearity occurs when the independent variables in a regression have high correlation with each other. If a problem with multicollinearity exists, it leads to unreliable and unstable estimates of regression coefficients (Farrar & Glauber, 1967). To test for multicollinearity between the independent variables we examine their variance inflator factor (VIF). The VIF can be found by running a linear regression of one independent variable, on all the other independent variables and then obtaining the R^2 of the regression. VIF is then calculated as

$1/(1-R^2)$. There is a rule of thumb stating that if VIF is higher than 4, there are serious multicollinearity problems (O'Brien, 2007). In panel A and panel B of Appendix 5 we present the results from the VIF test for both our first and second regression model. None of the independent variables have a VIF higher than 4, indicating that there is no problem with multicollinearity between the independent variables in any of our regression models. The VIF tests, together with the results from the Pearson correlations, show that that there is no substantial correlation between our independent variables affecting the estimate of the coefficients.

6.5 Validity, reliability and comparability

Regarding the validity of our study, we considered it to be high, since we have made delimitations and classifications based on previous research. We used well established models to measure both discretionary accruals and investment opportunities. However, there are weaknesses with these models which we have discussed. For example, the fact that Tobin's Q measures only average investment efficiency, might decrease the validity of our study. Therefore, we suggested adding another measure of investment opportunities by studying marginal q. As previously discussed, accrual-based models are shown to produce errors, meaning that they often under- or overstate the magnitude of accounting discretion used by managers. We have tried to control for this effect by using an alternative measure of discretionary accruals for robustness. Further, the classification of firms as either financially constrained or unconstrained is likely to be subject to bias as there are several additional factors that might have been left out that could affect a firm's financial position.

We consider the reliability of our results to be high as we have gathered data from trustworthy data sources, Thomson Reuters Datastream and Retriever Business. The data that could not be gathered from these sources was manually collected from published financial reports. We believe our results are highly replicable and that the consistencies of our findings are high. We have reached similar results with the original tests as with our conditional tests, further strengthening this view.

The comparability of our study can be argued to have been reduced by the use of yearly data rather than quarterly data when measuring discretionary accruals, investment and external financing. Since raising external capital and investing in projects can occur at any point of time during a fiscal year, capturing significant results may be affected by the use of yearly data. Measuring discretionary accruals on a yearly basis could possibly be subject to bias, since

yearly observations can incorporate both positive discretionary accruals and reversals. Jones (1991) states that the sum of a firm's earnings over time should correspond to the sum of its cash flows. Therefore, we could argue that the measurement of discretionary accruals would be more accurate and comparable to previous research, if measured on a quarterly basis. This approach would probably better capture the effect of discretionary accruals on external financing and investment decisions. What could also affect the comparability of our study is differences in institutional settings and accounting legislations between countries, as well as using a shorter time period than used by previous research.

7. Suggestions for future research

In this study, we aim to investigate the relationship between discretionary accruals and external financing for financially constrained firms with good investment opportunities. The results of our study open up to new areas of interest for future research, as we are aware of several limitations in our research method. Since we could not conclude whether financially constrained firms with good investment opportunities obtain external financing with the level of discretionary accruals, we believe that there are other approaches to explain this relationship that can be investigated.

One approach we suggest, is to use alternative measures of investment opportunities. In our study we used Tobin's Q, but other measures of investment opportunities could be considered by future research. For example, further studies could use the measure marginal q or construct a new measure by estimating deviations from the expected level of investment, either for a given firm or from the industry median.

Moreover, we encourage future research to study quarterly data to better capture differences in both discretionary accruals and external financing. Since external financing and accruals are reported on a quarterly basis, studying the relationship with more data during the same period of time might provide a different insight into the relationship between discretionary accruals and external financing.

Finally, as ownership structures in Sweden differ from American firms, we suggest that further studies could be made on how corporate governance factors and institutional features, such as ownership concentration, affect the relationship between financial reporting and corporate investment efficiency for financially constrained Swedish firms.

8. Summary and Conclusions

Research has found financial reporting to be of importance for decision makers. Thus, the incentives behind using accrual based earnings management is a relevant topic to investigate and understand. Previous studies conducted on U.S. data have evaluated the link between discretionary accruals and investment efficiency but not much research has been made in a Swedish setting, especially regarding financially constrained firms. In this thesis, we have provided an analysis on Swedish listed firms classified as financially constrained with good investment opportunities and investigated how financial reporting affects investment efficiency for these firms. We have used well-established models to estimate discretionary accruals and have classified firms as financially constrained based on the measures of leverage and cash balance. We classified firms as having good investment opportunities based on the measure Tobin's Q.

We began by investigating whether financially constrained firms with good investment opportunities have higher levels of discretionary accruals compared to their unconstrained counterparts. We then moved on to examine whether these firms inflate their earnings by engaging in strategic accrual reporting to signal future prospects to investors, prior to investment. Finally, we investigated whether this action enables financially constrained firms with good investment opportunities to obtain more external financing. We could not establish conclusive evidence of a relationship between the use of discretionary accruals and the level of either investment or external financing, for financially constrained Swedish firms. This suggests that the use of strategic accrual reporting to inflate earnings does not have a significant impact on corporate investment decisions.

The findings of our research are contrary to results presented by previous studies conducted on U.S. firms, which have found a significant relationship between discretionary accruals and investment efficiency. An interpretation that can be made from our results is that higher ownership concentration in the Swedish market contributes to a reduction in information asymmetries between managers, investors and capital providers. We leave it to further research to assess the corporate governance effects on discretionary accruals for under-investing financially constrained firms.

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Appendix

Appendix 1.

Pearson Correlations

	DisAccr Kothari	*DisAccr Jones*	*External Financing*	*Investment*	*Leverage*	*Cash balance*	*CFO*	*Sales Growth*	*Book to Market*	*Return on Assets*	*Tangibility*
DisAccr Kothari	1										
DisAccr Jones	0.850 ***	1									
External Financing	0.015	0.021	1								
Investment	0.025	0.017	0.309 ***	1							
Leverage	-0.036	-0.041	-0.088 ***	-0.121 ***	1						
Cash balance	0.062 *	0.101 ***	0.218 ***	0.278 ***	-0.393 ***	1					
CFO	-0.167 ***	-0.092 ***	-0.429 ***	-0.184 ***	0.093 ***	-0.119 ***	1				
Sales Growth	0.072 **	0.069 **	-0.010	0.072 **	-0.014	0.067 **	0.025	1			
Book to Market	0.077 **	0.025	-0.148 ***	-0.169 ***	0.107 ***	-0.241 ***	-0.006	-0.006	1		
Size	-0.076 **	-0.052	-0.157 ***	0.004	0.200 ***	-0.323 ***	0.201 ***	-0.015	-0.079 **		
Return on assets	-0.069 **	0.011	-0.461 ***	-0.222 ***	0.041	-0.114 ***	0.777 ***	0.058 *	-0.025	1	
Tangibility	-0.041	-0.059 *	-0.066 **	0.051	0.179 ***	-0.243 ***	0.079 **	0.028	0.056 *	0.076 **	1

This table shows the Pearson correlation coefficients for all variables included in both the first and second regression. DisAccr Kothari is discretionary accruals calculated with the performance adjusted model. DisAccr Jones is discretionary accruals calculated with the Modified Jones model. Both investment and external financing is measured one year after the remaining variables. Significance levels: *** p <0.01, ** p<0.05, * p<0.1

Appendix 2.

Panel A: Conditional analysis of discretionary accruals and finacial constraints
using the Modified Jones model to estimate discretionary accruals

Dependent variable = Discretionary accruals

Variable	Coefficients	Std error	t-statistics	P-value
Intercept	26.236 *	14.567	1.80	0.072
Constrained	2.509	5.034	0.50	0.619
Investment	0.294	0.282	1.04	0.298
Constrained*Investment	-1.211 *	0.700	-1.73	0.084
Salesgrowth	0.036	0.030	1.17	0.241
BTM	-0.010	0.068	-0.15	0.881
CFO	-0.370 ***	0.137	-2.71	0.007
Size	-1.640 **	0.847	-1.94	0.053
Year fixed effects	Yes			
Industry fixed effects	Yes			
Observations	930			
R-squared	0,1700			

The table presents the results from an OLS regression of discretionary accruals on a constraint measure and on subsequent investments, for firms with good investment opportunities. The dependent variable is discretionary accruals calculated with the Modified Jones model. The independent variables include constrained, investment and an interaction term between the two. Constrained is a binary variable, based on net leverage and cash balance, taking the value one when a firm is constrained. Investment is calculated one year ahead of the remaining variables. The control variables include sales growth, book-to-market, cash flow from operations and size. All variables, except for constrained and size, are winsorized at the 1st and 99th percentiles. The regression is estimated with year fixed effects and industry fixed effects. Robust standard errors are reported in the second column. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Panel B: Conditional analysis of external financing and discretionary accruals
using the Modified Jones model to estimate discretionary accruals

Dependent variable = External Financing

Variable	Coefficients	Std error	t-statistics	P-value
Intercept	12.127 **	5.563	2.18	0.030
Discretionary Accruals	-0.004	0.013	-0.33	0.741
Size	-0.361	0.310	-1.16	0.246
BTM	-0.034	0.021	-1.58	0.116
Tangibility	-0.081 *	0.048	-1.70	0.089
ROA	-0.354 **	0.142	-2.49	0.013
Year fixed effects	Yes			
Industry fixed effects	Yes			
Observations	284			
R-squared	0.1555			

The table presents the results from an OLS regression of external financing on discretionary accruals, for financially constrained firms with good investment opportunities. The classification of constrained firms is based on net leverage and cash balance. The dependent variable is external financing, calculated one year ahead of the independent variables. The independent variable is discretionary accruals calculated with the Modified Jones model. The control variables include size, book-to-market, tangibility and return on assets. All variables, except size, are winsorized at the 1st and 99th percentiles. The regression is estimated with year fixed effects and industry fixed effects. Robust standard errors are reported in the second column. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Appendix 3.

Panel A: Conditional analysis of discretionary accruals and finacial constraints
using cash flow from operations to classify firms as financially constrained

Dependent variable = Discretionary accruals

Variable	Coefficients	Std error	t-statistics	P-value
Intercept	11.749	19.143	0.61	0.540
Constrained (CFO)	9.542 *	5.114	1.87	0.062
Investment	0.171	0.422	0.40	0.686
Constrained*Investment	0.084	0.464	0.18	0.857
Salesgrowth	0.031	0.030	1.05	0.296
BTM	0.101	0.081	1.24	0.216
Leverage	-0.001	0.004	-0.22	0.828
Cash balance	0.300 *	0.180	1.67	0.096
Size	1.582	1.034	-1.53	0.126
Year fixed effects	Yes			
Industry fixed effects	Yes			
Observations	930			
R-squared	0.1023			

The table presents the results from an OLS regression of discretionary accruals on a constraint measure and on subsequent investments, for firms with good investment opportunities. The dependent variable is discretionary accruals calculated with the performance adjusted model. The independent variables include constrained, investment and an interaction term between the two. Constrained is a binary variable, based on cash flow from operations, taking the value one when a firm is constrained. Investment is calculated one year ahead of the remaining variables. The control variables include sales growth, book-to-market, leverage, cash balance and size. All variables, except for constrained and size, are winsorized at the 1st and 99th percentiles. The regression is estimated with year fixed effects and industry fixed effects. Robust standard errors are reported in the second column. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Panel B: Conditional analysis of external financing and discretionary accruals
using cash flow from operations to classify firms as financially constrained

Dependent variable = External Financing

Variable	Coefficients	Std error	t-statistics	P-value
Intercept	28.583 **	14.228	2.01	0.046
Discretionary Accruals	0.007	0.019	0.37	0.709
Size	-0.851	0.868	-0.98	0.328
BTM	-0.120 ***	0.033	-3.64	0.000
Tangibility	-0.016	0.138	-0.12	0.908
ROA	-0.529 ***	0.112	-4.71	0.000
Year fixed effects	Yes			
Industry fixed effects	Yes			
Observations	282			
R-squared	0.3140			

The table presents the results from an OLS regression of external financing on discretionary accruals, for financially constrained firms with good investment opportunities. The classification of constrained firms is based on cash flow from operations. The dependent variable is external financing, calculated one year ahead of the independent variables. The independent variable is discretionary accruals calculated with the performance adjusted model. The control variables include size, book-to-market, tangibility and return on assets. All variables, except size, are winsorized at the 1st and 99th percentiles. The regression is estimated with year fixed effects and industry fixed effects. Robust standard errors are reported in the second column. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Appendix 4.

Heteroskedasticity

Dependent variable	**Discretionary accruals**	**External Financing**
White´s test		
χ^2_{obs}	521.85	131.17
Significance level	0.000	0.0370
BP test		
χ^2_{obs}	602.22	284.49
Significance level	0.000	0.000

The table presents heteroskedasticity tests for the OLS regression of discretionary accruals in the left kolumn and of External financing in the right kolumn. The first row presents the results from White's test and the second row presents the results from the BreuschPagan Cook-Weisberg test.

Appendix 5.

Panel A. Multicollineraty

Dependent variable = Discretionary accruals		
Variable	***VIF***	***1/VIF***
Constrained	1.66	0.603
Investment	1.42	0.704
Constrained*Investment	1.69	0.591
Salesgrowth	1.03	0.974
BTM	1.26	0.792
CFO	1.19	0.844
Size	1.27	0.788
Year		
2010	1.82	0.550
2011	1.54	0.649
2012	1.69	0.590
2013	1.71	0.586
2014	1.71	0.585
2015	1.76	0.568
GICS		
25	1.18	0.848
30	1.15	0.868
35	1.38	0.723
45	1.35	0.743

The table presents a variance inflation test for the OLS regression with the dependent variable discretionary accruals and the explanatory variables constraint, investment, the interaction term between constraint and investment, and a set of control variables. The sample consists of 930 firm-years observations over the time-period 2009-2015. VIF can take on values larger than 1 and values closer to 1 indicates less multicollinearity problems.

Panel B. Multicollineraty

Dependent variable = External financing		
Variable	***VIF***	***1/VIF***
DisAccr	1.28	0.782
Size	1.42	0.706
BTM	1.35	0.740
Tangibility	1.36	0.737
ROA	1.30	0.769
Year		
2010	2.02	0.496
2011	1.66	0.603
2012	1.68	0.594
2013	1.65	0.605
2014	1.81	0.553
2015	1.80	0.557
GICS		
25	1.38	0.726
30	1.14	0.877
35	1.17	0.858
45	1.29	0.778

The table presents a variance inflation test for the OLS regression with the dependent variable external financing and the explanatory variable discretionary accruals, and a set of control variables. The sample consists of 284 firm-years observations over the time-period 2009-2015. VIF can take on values larger than 1, values closer to 1 indicates less multicollinearity problems.