Do Investment Opportunities reduce managers’ motivation to inflate earnings?

Evidence from European financially constrained firms

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ABSTRACT: In this study we examine whether investment opportunities affect financial reporting decisions. In particular, we hypothesize and test whether financially constrained companies are more prone to bloat their earnings and whether high investment opportunities could reduce managers’ motivation to inflate earnings. We analyze a large sample of European firms during 2005-2007 and find that there is an inflating tendency widespread among financially constrained companies but the tendency is reversed for those with higher growth potential. Moreover, we find that companies that used accounting discretion to create hidden reserves, with larger income-decreasing discretionary accruals, invest more than those with smaller accruals, both positive and negative. This results suggest that managers of financially constrained companies, before undertaking an investment project, have a lower incentive to bloat earnings, and, instead, could use discretion to create reserves ex ante in order to report satisfying investment results ex post, preventing to “ratchet-up” the expectations of future earnings and getting away from negative surprises. We also find that, for constrained firms, income-decreasing earnings management ex-ante is associated with a lower likelihood of under-investments ex-post.
I. INTRODUCTION

Prior studies on earnings management and discretionary accruals analyze a large number of incentives and motivations on why firms use discretion to misrepresent economic performance.

Most studies on abnormal or discretionary accruals analyze causes or consequences of income-increasing discretionary accruals, but recent studies have shown that the business-men perspective is more articulated. Analyzing the motivation that drives managers to manage earnings is an extremely complex task because it requires researchers to enter the mind of the manager.

Through a survey and direct interviews with managers, Dichev, Graham, Harvey, and Rajgopal (2013) point out that, even though the heavy emphasis on income-increasing results, CFOs believe that 40% of earnings management is income-decreasing. Furthermore, the authors show that almost 42% of managers use reporting discretion within GAAP that misrepresent their economic performance in order to reduce expectations of future earnings.

It is not yet clear what leads managers’ motivation to deflate earnings and whether managers strategically use discretion in income-decreasing manipulation.

In this study we aim to test a possible driver that could affect financial reporting policies. Particularly, we examine whether high investment opportunities influence the motivation that drives managers to use discretion in the financial reporting process. This research aims to answer the following questions:

1) In which way do companies use accounting discretion when they have good investment opportunities, but have to face financial constraints?

2) In which way a strategical use of income-decreasing accounting manipulation affects investment efficiency?
We hypothesize that, in general, managers of financially constrained companies use positive discretionary accruals to report a better condition than the real one and so, constraints lead to a prevailing trend to inflate earnings, in order to delay bad news and mislead investors.

We also hypothesize that high investment opportunities could reduce the inflating tendency widespread among financially constrained companies, because managers might have less incentive to bloat earnings, relying on good future prospects. In situations of uncertainty, such as undertaking an investment, managers might prefer to adopt conservative accounting choices, and to avoid excess boost of expectations, both internal and external.

For instance, prior studies (Collins & Kothari, 1989; Skinner & Sloan, 2002) show that managers of high-growth firms likely have greater incentives to avoid missing earnings expectations. Moreover, Bandyopadhyay, Brown, and Richardson (1995) underline that keeping expectations low, to avoid negative earnings surprises, is likely to be less costly for high-growth firms.

We assume that for financially constrained companies with higher investment opportunities there is a reversal of inflating tendency, also for the presence of income-decreasing earnings manipulation. In this case, indeed, some managers might use discretion to deflate current earnings with income-decreasing accounting operations, in order to create a piggy-bank from which to draw when the investment is realized.

Setting up hidden reserves allows them to report satisfying investment results, showing that the investment undertaken was profitable, and to avoid costly consequences deriving from giving the market a negative surprise.

This study contributes to the literature in several ways. First, recent studies have highlighted that in literature there is an overemphasis on income-increasing earnings management with respect to income-decreasing earnings management, although the latter seems to affect about
40% of earnings manipulation; in our study we analyze a possible motivation that drives managers to save earnings for future periods and to strategically use negative discretionary accruals.

Second, a large body of academic research examines separately causes and consequences of earnings management. Welcoming the recommendation proposed in the literature (Dechow, Ge, & Schrand, 2010) we use a comprehensive approach, investigating a driver of accounting manipulation and the impact on investment decisions.

Third, this study contributes to give evidence about how firms make financial reporting decisions and how these could influence corporate investment choices. Indeed, even though a large body of academic research have examined the causes and consequences of earnings management there is a little analysis of how discretionary accruals impact corporate financial decisions.

Furthermore our work gives an interesting contribution to regulators showing how the fear for market overreaction leads to lower level of earnings quality, measured by the level of discretionary accruals that managers use to reduce current earnings.

Finally this study gives a considerable contribution to auditors for which the topics of earnings quality and the detection of earnings management is a top priority; the adoption of income-decreasing earnings management might be considered as a conservative accounting choice that auditors often treat with more kindness although it affects earnings quality when it’s used to misreport relevant information, for example before undertaking highly risky investments.

The structure of the paper is as follows. Section II discusses the related literature. Section III describes our hypotheses. Section IV describes our research design and our sample. Section V presents our empirical results, and Section VI concludes.
II. LITERATURE BACKGROUND

Prior literature on earnings management widely examines determinants of earnings quality and analyzes a large number of incentives and motivations about why firms use discretion to misrepresent economic performance.\(^1\)

The extensive literature suggests that the incentives arise in different contexts, for instance influencing the terms of compensation, influencing the terms of debt contracts or avoiding debt covenant violations. Other incentives can be related to the market capital, such as influencing stock prices and equity valuations. However, most studies show that managers use accounting discretion opportunistically, with the intent to mislead investors. Few studies provide evidence that managers use discretionary accruals to signal their private information.

Subramanyam (1996) finds a positive correlation between stock returns and unexpected accruals. He interprets this result as evidence that discretionary accruals are signals of managers’ private informations.

Campello and Graham (2013) find that high stock prices affect corporate decisions because they create the effect of relaxing financial constraints. Particularly the authors examine the 1990’s technology bubble and find that irrationally high stock prices allowed financially constrained firms to facilitate investments through the proceeds of an equity issue.

Linck, Netter, and Shu (2013) find that high accruals firms experience significantly higher earnings-announcement returns than low-accrual firms, and that this pattern is stronger for constrained firms than for unconstrained firms. This result suggests that the use of discretionary accruals has a positive impact on stock prices of constrained firms.

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However, Guay, Kothari, and Watts (1996) show analytically that a positive correlation between returns and discretionary accruals is consistent with both the opportunistic behavior hypothesis and the signaling hypothesis.

Many studies find that the market reaction to the announcements of events such as initial public offerings (IPOs), seasoned equity offerings (SEO), and stock-for-stock mergers is negatively correlated with the pre-event abnormal accruals, which suggests that pre-event discretionary accruals misled investors (Louis, 2004; Shivakumar, 2000; Teoh, Welch, & Wong, 1998a, 1998b).

On the other hand, Louis and Robinson (2005) find that managers use accruals prior to stock splits to signal private information.

Indeed, many studies suggest that a) managers split stocks when they have favorable private information (e.g., Ikenberry, Rankine, & Stice, 1996), and b) the market under-reacts to the signal conveyed by a stock split (e.g., Ikenberry and Ramnath, 2002). The authors posit that combining the discretionary accrual signal with the stock split signal is likely to be an effective means of communicating favorable private managerial information. But they also conjecture that, without a second corroborating signal, discretionary accruals might be regarded as opportunistic.

Matsumoto (2002) underlines that managers have two ways for avoiding negative earnings surprises: they can manage earnings upward if unmanaged earnings don’t meet expectations, or they can guide analysts’ expectations downward to avoid overly optimistic forecasts, in order to improve their chances to meet or beat future forecasts. He also assumes that for high growth firms, keeping expectations low is likely to be less costly.

We assume that, in general, managers of financially constrained companies use positive discretionary accruals to report a better condition than the real one; but for constrained firms with high investment opportunities the inflating tendency widespread among financially
constrained companies is reversed. In particular we assume that managers of financially constrained companies with high potential investments might use discretion to deflate current earnings with income-decreasing accounting operations.

A growing stream of literature analyzed the relation between accounting quality and investment efficiency. For example, Biddle and Hilary (2006) find that higher quality enhances investment efficiency – proxied by lower investment-cash flow sensitivity - by reducing information asymmetry between managers and suppliers of capital.

Verdi (2006) and Bushman, Piotroski, and Smith (2006), also find relationship between properties of accounting information and investment decisions.

McNichols and Stubben (2008) find that firms manipulating earnings\(^2\) over-invest during the misreporting period and following the misreporting period, these companies no longer over-invest and conclude that earnings management affects resources allocation and leads to sub-optimal investment decisions.

Li and Tang (2008) show that companies with high positive discretionary accruals misallocate resources. Kedia and Philippon (2009) analyse firms that restated earnings and suggest that bad managers hire and invest too much in order to pool with the good managers.

Biddle, Hilary, and Verdi (2009) document a negative relation between reporting quality and investment for firms more prone to over-invest and a positive association for companies more prone to under-invest; they also find that firms with higher financial reporting quality deviate less from predicted investment levels. Their findings suggest that higher-quality financial reporting improves capital investment efficiency, because it reduces investment for

\(^2\) McNichols and Stubben (2008) examine fixed asset investments of companies investigated by the SEC for accounting irregularities, firms sued by their shareholders for improper accounting, and firms that restated financial statements. The authors also find similar patterns for firms with high positive discretionary revenues or accruals.
companies most likely to over-invest, and improves investment for companies most likely to under-invest.

Linck et al. (2013) find that financially constrained firms with valuable projects can use positive discretionary accruals to signal positive prospects, enabling them to raise capital and to make investments.

However, collectively, literature suggests that firms with bloated earnings (large positive discretionary accruals) are more prone to over-invest and to undertake less efficient projects.

Our work differs from the others because we assume that investment opportunities drive manager’s motivation to deflate earnings before undertaking the investment and then we analyze the consequences on investment decisions for companies that have made income-decreasing reporting operations.

III. HYPOTHESES DEVELOPMENT

In the literature there is a strong evidence that attracting external financing is an important motivation for earnings manipulation (Dechow, Sloan, & Sweeney, 1996; Dechow, Ge, Larson, & Sloan, 2011; Rangan, 1998; Teoh et al., 1998a, 1998b).

Moreover, the empirical evidence shows that the will to reach external capital drives managers to adopt accounting practices to opportunistically influence market valuations, by reporting earnings which misrepresent economic performance (Aharony, Lin, & Loeb, 1993; Friedlan, 1994; Haw, Qi, D. Wu, & W. Wu, 2005; Morsfield & Tan, 2006).

This leads us to assume that if the company faces financial constraints that obstruct access to the capital market, it has a stronger incentive to inflate earnings in order to dazzle the market.

Furthermore, Dichev et al. (2013) highlight motivations that drive managers to misrepresent their economic performance. From their survey arises that 93,5% of CFOs use reporting
discretion to influence stock price and that 72.5% manage earnings to avoid debt covenant violations.

Campello and Graham (2013) point out that high stock prices could relax financial constraints, thus financially constrained companies might have stronger incentive to bloat earnings in order to boost stock prices; in addition highly levered firms could have a more strong concern about debt covenant violations, thus managers in more highly levered firms could be taking action to boost income or manipulate the financial statements so as to avoid violating a covenant (Watts & Zimmerman, 1986). All these considerations lead us to assume that there may be a tendency to inflate earnings among constrained firms.

However, the inflating tendency could be reduced if good future prospects are expected. Indeed, managers are disinclined to make optimistic projections because they believe that such projections would expose them to lawsuits if they do not materialize (Ruhnka & Bagby, 1986; Skinner, 1994 - 1997).

In addition, managers feel a very strong pressure from the outside (market, analysts and lenders) and their main concern is to avoid surprises (e.g. Dichev et al., 2013). Bloated earnings might lead analysts and investors to “ratchet up” expectations of future earnings (Graham, Harvey, & Rajgopal, 2005), which lead to exacerbate the outside pressure. Prior studies point out that managers of high-growth firms have stronger incentives to avoid missing earnings expectations (Collins & Kothari, 1989; Skinner & Sloan, 2002), and that for high-growth firms is likely less costly keeping expectations low to avoid negative earnings surprises (Bandyopadhyay et al., 1995). Moreover, Dichev et al. (2013) also show that around 40% of earnings management is income-decreasing, and that around 42% of surveyed CFOs

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The importance of stock price and the perceived unrelenting outside pressure is summarized in the simple words of a CFO, reported by Dichev et al. (2013), according to which “you will always be penalized if there’s any kind of surprise”
use reporting discretion in order to reduce expectations of future earnings, underlining how this is consistent with the inter-temporal settling up of accruals in settings like cookie jar reserves and big baths (e.g., Dechow, Hutton, Kim, & Sloan, 2012; Elliot & Hanna, 1996).

Consistently, considering costs (Badertscher, 2011; Chaney & Lewis, 1995; Dye, 1988; Liu & Wysocky, 2007; Trueman & Titman, 1988; Zang, 2012) and litigation risk associated with inflating earnings (Dechow et al., 1996; DuCharme, Malatesta & Sefcik, 2004), we assume that the tendency to bloat earnings among financially constrained companies is lower for those constrained firms that have good growth prospects.

Indeed if a company has high growth and investment potential, it has less incentive to face external pressure, costs and litigation risks deriving from pushing up current earnings because it can rely on the increase of accounting results once the investments will bear fruit. In addition, in an uncertainty situation, such as investment decisions, conservative accounting is traditionally viewed as a shield against uncertainty⁴, thus manager who want to exploit investment potential have a lower incentive to bloat earnings, and, instead, could use discretion to create reserves ex ante in order to report satisfying investment results ex post, preventing uncertainty and getting away from negative surprises. Nevertheless, auditors do not look as closely at under-statement of earnings and assets relative to overstatement (Dichev et al., 2013), and this could lead to persuade managers that the manipulation will go undetected.

Considered all previous motivations that could lead managers to a strategical use of income-decreasing manipulation, we want to analyze the relation with investment efficiency.

Neoclassical model of investment predicts that a company will invest up until the marginal cost of investing is equal to the marginal profitability of capital (e.g., Lucas & Prescott, 1971;

⁴ In their paper, Dichev et al. (2013) report the words of an interviewed CFO: “conservative accounting is the way to go because you have less of a worry when the market turns against you. You are better insulated against the unknown”.
Mussa, 1977). However information asymmetries between companies and suppliers of capital could cause investment to vary from the optimal level by giving rise frictions that can lead to over- and under-investment, depending on the availability of capital.

We focus our study on financially constrained companies, identifying them as those with low cash and high leverage⁵. Because of the low availability of liquidity, these companies are generally more prone to underinvest⁶. Prior studies suggest that accounting conservatism affects firm’s investment policies by reducing contracting costs (Beatty, Weber, & Yu, 2008; Zhang, 2008); Ahmed, Billings, Morton, and Stanford-Harris (2002) find that conservative accounting is associated with a lower cost of debt, suggesting that debtholder prefer conservatism which facilitates the retrieval of funds; consistently evidence shows that conservatism is related to investment efficiency by reducing both over- and under-investment (Garcia Lara, Garcia Osma, & Penalva, 2010) and leads to higher future profitability (Ahmed & Duellman, 2011).

Thus we hypothesize that financially constrained firms might adopt a conservative accounting behaviour strategically, prior to undertake an investment and this could increase investment efficiency, particularly by reducing under-investment.

All of these considerations lead us to formulate our hypotheses as follows:

**H1 a):** Among financially constrained companies there is a tendency to inflate earnings.

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⁵ We follow Biddle et al. (2009). The authors use two firm-specific characteristics, cash balance and leverage, to proxy for firm liquidity, that are likely to affect the likelihood that a firm will over- or under-invest.

⁶ Firms with high leverage are more likely to suffer a debt overhang problem that will force them to underinvest (e.g. Myers, 1977). Conversely, due to the agency problems and the misalignment of managerial and shareholders incentives (e.g. Blanchard, Lopez-de-Silanes, & Shleifer, 1994; Jensen & Meckling, 1976; Jensen, 1986; Opler, Pinkowitz, Stulz, & Williamson, 1999), firms with large cash are more likely to over-invest.
**H1 b)**: The inflating tendency among financially constrained companies decreases as investment opportunities increase.

**H2**: Among financially constrained firms, the likelihood of under-investing *ex-post* is lower for those with income-decreasing discretionary accruals *ex-ante*.

### IV. RESEARCH DESIGN AND SAMPLE

**Proxy for accruals management**

To proxy for accruals management, we estimate discretionary accruals using the modified Jones (1991) model, adjusting for past performance as recommended by Kothari, Leone, and Wasley (2005).

Specifically, to estimate normal or expected accruals, we estimate the following regression for each industry-year:

\[
\frac{TACC_{j,y}}{TA_{j,y-1}} = \lambda_1 \frac{1}{TA_{j,y-1}} + \lambda_2 \frac{(\Delta S_{j,y} - \Delta AR_{j,y})}{TA_{j,y-1}} + \lambda_3 \frac{PPE_{j,y}}{TA_{j,y-1}} + \epsilon_{j,y} \tag{1}
\]

where \(TACC_{j,y}\) is total accrual of firm \(j\), defined as the change in non-cash current assets minus the change in current liabilities, plus the change in debt in current liabilities minus depreciation; \(\Delta S_{j,y}\) equals net sales for firm \(j\) in year \(y\) minus net sales for year \(y-1\); \(\Delta AR_{j,y}\) equals accounts receivable for firm \(j\) in year \(y\) minus accounts receivable for year \(y-1\) and so the difference between the change in net sales and the change in accounts receivable represents the portion non-cash of revenues; \(PPE_{j,y}\) is the gross value of property, plant, and equipment for year \(y\). All variables are scaled by total assets at the beginning of the year \((TA_{j,y-1})\). Details of the variables are described in Appendix.
We trim all scaled variables at the 1st and 99th percentile to control for outliers that could cause noises to the model. The regression residuals, $\varepsilon_{j,y}$, capture discretionary accruals. Following Kothari et al. (2005), we adjust discretionary accruals for past accounting performance. Specifically, performance-adjusted abnormal accruals are calculated as the difference between firm $j$’s discretionary accruals and the average discretionary accruals of other firms in the same industry ROA quartile, where the average calculation excludes firm $j$.

**Proxy for financial constraints**

As highlighted by previous studies there is no universally accepted measure of financially constrained firms (e.g. Linck et al., 2013). Consistent with the object of this analysis we follow Biddle et al. (2009) and focus on firm liquidity using two proxies identified by the prior literature which are cash and leverage. We proceed dividing the sample in percentiles based on the reported value of cash and leverage; companies that are in both the bottom 50% of cash and in the top 50% of leverage are considered financially constrained (34% of sample firms).

**Measure of investment opportunities**

We identify investment opportunities as the predicted level of investment estimated through a linear model relating capital expenditure to Tobin’s $Q$ and Sales growth.

Neoclassical model of investment states that investments depends only on investment opportunities (Modigliani & Miller, 1958). Tobin (1969) shows that investment opportunities are summerized in marginal $q$ ratio$^7$, which is – in perfect capital markets - the sole driver of capital investment policy.

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$^7$ Hayashi (1982) provides conditions under which marginal $q$ is equivalent to average $Q$, which lead to the commonly used formulation above.
Following Biddle et al. (2009) we also include sales growth to control for growth opportunities.

Therefore we estimate firm’s investment opportunity as the predicted value of the following regression:

\[ \text{Inv}_{j,y+1} = \alpha_0 + \alpha_1 Q_{j,y} + \alpha_2 \text{SalesGrowth}_{j,y} + \epsilon_{j,y+1} \]  
\[ (2) \]

where \( \text{Inv}_{j,y+1} \) is investment of firm \( j \) in year \( y+1 \), calculated as capital expenditure scaled by property, plant, and equipment; \( Q_{j,y} \) is the Tobin’s Q ratio calculated as the summation of the market value of equity and total debt divided by the book value of assets; \( \text{SalesGrowth}_{j,y} \) is the change in sales from year \( y-1 \) to \( y \) divided by the value of sales in year \( y-1 \). Details of the variables are described in Appendix.

We trim all scaled variables at the 1st and 99th percentile to control for outliers.

The difference between the realized investment (\( \text{Inv}_{j,y+1} \)) and the potential one (Investment Opportunity) shows whether a company catch all potential projects or whether it invest too much or too little. Thus we use residuals, \( \epsilon_{j,y+1} \), as a firm-specific proxy for deviations from expected investment.

**Test of hypothesis H1**

First, we hypothesize that there is an inflating-tendency among financially constrained firms and that this tendency is reversed as investment opportunities increase.

We test this hypothesis using the regression model utilized by Linck et al. (2013), with some adaptations:

\[ DA_{j,y} = \beta_0 + \beta_1 FC_{j,y} + \beta_2 \text{InvOpp}_{j,y} + \beta_3 FC_{j,y} \ast \text{InvOpp}_{j,y} + \beta_4 \text{MtoB}_{j,y} + \beta_5 \text{SalesGrowth}_{j,y} + \epsilon \]
\[ (3) \]
where the dependent variable, $DA_{j,y}$, is represented by company $j$’s performance-adjusted discretionary accruals, estimated with the modified-Jones model; $FC_{j,y}$ is a binary variable equals to 1 if the firm is financially constrained and 0 otherwise; $InvOpp_{j,y}$ is the predicted value of investment, estimated in Equation (2); $FC_{j,y} * InvOpp_{j,y}$ represents the interaction between the two previous variables, and measures the investment opportunities of financially constrained companies. We also include Market to Book and Sales Growth because McNichols (2002) and Skinner and Sloan (2002) show that growth firms have a stronger incentive to manage earnings.

Since we are interested in analyzing whether financially constrained companies are more prone to inflate earnings and whether the inflating tendency among constrained companies is reversed as investment opportunities increase, $FC_{j,y}$ and $FC_{j,y} * InvOpp_{j,y}$ are the variables of interest. In particular, we would expect $FC_{j,y}$ to be significantly positive and $FC_{j,y} * InvOpp_{j,y}$ to be significantly negative.

In order to test our first hypothesis, we also conduct a further analysis. First, we divide companies into percentiles based on the level of investment opportunities, measured as the predicted level of investments estimated with Equation (2); firms in the top 30% are considered with high investment opportunities. Then we use the following regression model:

$$DA_{j,y} = \beta_0 + \beta_1 FC_{j,y} + \beta_2 HighInvOpp_{j,y} + \beta_3 FC_{j,y} * HighInvOpp_{j,y} + \beta_4 MtoB_{j,y} + \beta_5 SalesGrowth_{j,y} + \epsilon$$

(4)

where the dependent variable, $DA_{j,y}$, is represented by company $j$’s performance-adjusted discretionary accruals, measured in Equation (1); $FC_{j,y}$ is a binary variable equals to 1 if the firm is financially constrained and 0 otherwise; $HighInvOpp_{j,y}$ is a binary variable equals to
1 if the firm has high investment opportunities and 0 otherwise; $FC_{j,y} \times HighInvOpp_{j,y}$ is a binary variable equals to 1 if the firm is a financially constrained company with high investment opportunities and 0 otherwise. $MtoB_{j,y}$ and $SalesGrowth_{j,y}$ are the control variables.

$FC_{j,y}$ and $FC_{j,y} \times HighInvOpp_{j,y}$ are the variables of interest. In particular, we would expect $FC_{j,y}$ to be significantly positive and $FC_{j,y} \times HighInvOpp_{j,y}$ to be significantly negative.

**Test of hypothesis H2**

In order to test our second hypothesis we divide financially constrained companies into quartiles of discretionary accruals measured in year $y$.

Companies in the bottom quartile are those with negative discretionary accruals (Neg-DA; #113). Companies in the middle two quartiles are those with smaller both negative and positive discretionary accruals (HighFRQ, #223).

Then we conduct two different analyses, focusing on the subpopulation of constrained firms. First we estimate a multinomial logit model that predicts the effect of income-decreasing discretionary accruals on investments efficiency; specifically we classify firms on the basis of the deviation from the predicted level of investment measured in Equation (2). Since we are focusing on financially constrained firms, which are generally more prone to underinvest, we cannot divide companies in percentiles of investment deviation, because the distribution of investment deviation is not symmetric. So we have classified companies into clusters of investment deviation, using the classification technique of $k$-means clusters, for which each cluster is formed by the observations closer to their own centroid. We choose nine\(^8\) clusters,

\(^8\) The number of clusters must be fixed \textit{a priori}, but we conduct several tests with different number of clusters, obtaining similar results.
opting for the square of the three basic categories, that are over-investment, efficient-investment and under-investment. Companies in the middle cluster are classified as efficient-investing and they represents the benchmark category, since they have values of investment deviations close to zero; companies with lower (higher) value of investment deviation respect to the firm in the benchmark group with the lowest (highest) value of investment deviation is classified as under-investment (over-investment). Then we estimate the likelihood that a firm might be in the one of the extreme group as opposite to the benchmark group of the investment deviation, as follow:

$$\text{Prob} (\text{Inv}_{j,y+1} = j) = \beta_1 \text{NegDA}_{j,y} + \beta_2 \text{HighFRQ}_{j,y} + \beta_3 \text{Slack}_{j,y} + \beta_4 \text{Tang}_{j,y} +$$

$$+ \beta_5 \text{Kstruct}_{j,y} + \epsilon$$

(5)

where $j$ is equal to 1 if the firm is classified as under-investing, 2 if the company is in the benchmark group and 3 if the firm is classified as over-investing. The independent variable of interest is $\text{NegDA}_{j,y}$, which takes value of 1 if the company is in the bottom quartile of discretionary accruals and 0 otherwise. Since we are interested in analyzing whether the likelihood of under-investment is lower for companies that have done income-decreasing manipulation, for $j=1$, we expect the coefficient of this variable to be significantly negative. Since Biddle et al. (2009) show that financial reporting quality is associated with a reduction of both over- and under- investment, we control for it including a dummy variable, $\text{HighFRQ}_{j,y}$, equals to 1 if the company is in the middle quartile of discretionary accruals and 0 otherwise. Following Biddle et al. (2009) we also control for firm level ratios: $\text{Slack}_{j,y}$ is the ratio of cash to PPE; $\text{Tang}_{j,y}$ is the ratio of PPE to Total Assets; $\text{Kstruct}_{j,y}$ is the ratio of long term debt to the sum of long term debt and the market value of equity.
For robustness we conduct a further analysis. First we divide companies into quartiles of investment deviation; firms in the bottom quartiles are classified as under-investing. Then we estimate a logit model as follow:

\[
Under_{Inv_{j,y+1}} = \beta_1 \text{NegDA}_{j,y} + Controls + \epsilon
\]  

(6)

where \(Under_{Inv_{j,y+1}}\) takes value of 1 if the firm is classified as under-investing and 0 otherwise; \(\text{NegDA}_{j,y}\), is equals to 1 if the company is in the bottom quartile of discretionary accruals and 0 otherwise; the set of control variables is the same we use in estimating Equation (5). If firms with negative discretionary accruals are less likely to under-invest, we expect \(\beta_1\) to be significantly negative.

**Sample selection**

Our sample consists of 1,313 firm-year observations in 2005 and 2006. The initial sample of firms consists of all nonfinancial companies listed in the 28 Member States of European Union.

We collect financial reporting data from Amadeus. Since we require all firms have financial reporting data available in years \(y\), \(y-1\) and all data available for investment in year \(y+1\), we drop all companies with information not available. In order to mitigate the influence of

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9 We exclude financial firms (SIC 6000-6999) because the nature of their capital structure is significantly different from the others.

10 Specifically, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

11 [https://amadeus.bvdinfo.com](https://amadeus.bvdinfo.com)
outliers, we trim all variables in Equation (1) and Equation (2) at the 1% and 99% levels by year.

We also drop companies in SIC codes between 0111 and 0191\(^\text{12}\) because of the paucity of observations. Indeed to estimate cross sectional regression, we require an industry-year to have at least 10 firm-year observations. The collected data was analysed using the Statistical Package for the Social Science (SPSS) software. Table 1 describes the process of sample selection.

[INSERT TABLE 1 HERE]

Table 2 provides summary statistics for our key metrics. Depending on their financial position, sample is divided into two groups, financially constrained companies (#449) and the others (#864).

[INSERT TABLE 2 HERE]

V. EMPIRICAL RESULTS

Panel A of Table 3 presents Pearson correlation among the variables used in Equation (3). Table 3, Panel B, reports the results of the regression of discretionary accruals on financial constraints and investment opportunities. We analyze 1,313 firm-year observations; the model is significant (\(p\)-value 0.000) with an adjusted R square at 1.7%, not very high but in line with literature.

\(^{12}\) We exclude companies in Agriculture, Forestry and Fishing industries.
FC_{j,y} is positive and statistically significant (coefficient 0.04; p-value 0.000), which confirms the tendency to inflate earnings among financially constrained firms. FC_{j,y} \times InvOpp_{j,y} is negative and statistically significant (coefficient -0.002; p-value 0.055); this result suggests that the tendency to inflate earnings among financially constrained firms is reversed as investment opportunities increase.\textsuperscript{13}

[INSERT TABLE 3 HERE]

Panel B of Table 4 reports the results of the regression of discretionary accruals on financial constraints and high investment opportunities. FC_{j,y} is significantly positive (coefficient 0.037; p-value 0.000); FC_{j,y} \times HighInvOpp_{j,y} is negative and statistically significant (coefficient -0.033; p-value 0.044); these results confirm the tendency to inflate earnings among constrained firms and suggest that this tendency is reversed for financially constrained companies with high investment potential.

[INSERT TABLE 4 HERE]

\textsuperscript{13} For robustness, we also repeat the test using Net Leverage (details in Appendix) to proxy for financial constraints. Specifically we divide sample in percentiles of Net Leverage and consider firms in the bottom 30% as financially constrained companies. Untabulated results confirm our hypotheses. We also conduct a univariate analysis; specifically we compare a) means of discretionary accruals between financially constrained companies and the other companies; and b) means of discretionary accruals between financially constrained firms with high investment opportunities and the other financially constrained companies. Untabulated results also confirms that there is an inflating tendency among constrained companies and that it is reversed for constrained companies with higher investment opportunities.
With respect to our H2 hypothesis, we first estimate a multinomial logistic regression that tests the likelihood that a firm might over- or under-invest conditional on the use of income-decreasing accounting choice. Table 5 reports results of this estimation; specifically Panel A presents the results regarding the likelihood that a firm might under-invest as opposed to invest in an efficient manner (i.e., firms in the benchmark group); Panel B presents the results regarding the likelihood that a firm might be in the over-investing group as opposed to be in the benchmark category.

[INSERT TABLE 5 HERE]

We assumed that managers who want to exploit investment opportunities might have a strong incentive to create hidden reserves before undertaking potential investment, through income-decreasing earnings management. Evidence shows that firms with negative discretionary accruals are less likely to deviate from optimal investment both by over- or under-investing.

In particular, in Panel A, the coefficient on \( \text{NegDA}_{j,y} \) is significantly negative (\( \text{coefficient} = 1.108; \text{p-value} = 0.001; \text{exp-coeff.} = 0.33 \)); this result shows that, for firms with negative discretionary accruals in year \( y \), the likelihood to under-invest in year \( y+1 \) decreases by 33%.

Furthermore, we estimate a logit model that predicts the likelihood for firms with income-decreasing accruals to underinvest (i.e., to be in the bottom quartile of investment deviation). Results are summarized in Table 6 and confirm that the likelihood to underinvest is lower for constrained companies with negative discretionary accruals (\( \text{coefficient} = 0.506; \text{p-value} = 0.032; \text{exp-coeff.} = 0.60 \)).

[INSERT TABLE 6 HERE]
Overall our findings are consistent with the hypothesis that financially constrained firms are more prone to inflate earnings, but this tendency is reversed for constrained firms with high investment opportunities. Moreover our findings confirm the hypothesis that the likelihood to under-invest is lower for constrained companies which have done income-decreasing manipulation, suggesting that managers who want to exploit investment potential, have a strong incentive to strategically create hidden reserves before undertaking a potential project.

VI. CONCLUSION

In this study we investigate whether investment opportunities affects financial reporting decisions, for firms that have to face frictions with external parties.

In particular, we hypothesize and test whether financially constrained firms are more prone to bloat their earnings and whether high investment opportunities could reduce managers’ motivation to inflate earnings.

We find that there is an inflating tendency widespread among financially constrained companies but the tendency is reversed for those with higher investment opportunities.

Moreover, we find that companies that used accounting discretion to create hidden reserves, with larger income-decreasing discretionary accruals, invest more than those with smaller accruals, both positive and negative and are less likely to under-invest. This means that managers have a strong incentive to move earnings down before undertaking investment projects, in order to avoid to “ratchet-up” the expectations of future earnings; using accounting discretion, managers could realize efficient potential investments.

In interpreting our results must keep in mind that upward or downward earnings management are “two sides of the same coin” (Dichev et al., 2013). Future studies can provide evidence of whether and when negative discretionary accruals are reversed in future periods, for example after realizing risky investments.
Future works can also examine what kind of pressure leads income-decreasing earnings management (e.g. inside or outside pressure), or whether it is most prevalent in companies with particular characteristics, such as ones largely covered by analysts. In addition, future studies, can also examine the impact of the “human element” in the upward or downward direction of the manipulation; for instance, overoptimistic managers could be less cautious before undertaking investments.

Our work is subject to at least three caveats. First, we select financially constrained firms according to the degree of their liquidity, proxied by cash balance and leverage, thus it is possible that our results are not generalizable to all alternative constraints measure. Second, the dependent variable (managerial accounting discretion) is subject to the ability of the modified-Jones model to identify abnormal accruals and the potential to limit misclassification errors. Third, our results are subject to measurement error problems related to the estimate of investment opportunities.
REFERENCES


## APPENDIX

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Current Assets</td>
</tr>
<tr>
<td>AR</td>
<td>Account Receivables</td>
</tr>
<tr>
<td>CHE</td>
<td>Cash and cash equivalent</td>
</tr>
<tr>
<td>DA</td>
<td>Discretionary Accruals</td>
</tr>
<tr>
<td>DLC</td>
<td>Debt in Current Liabilities</td>
</tr>
<tr>
<td>DLT</td>
<td>Long Term Debt</td>
</tr>
<tr>
<td>DP</td>
<td>Depreciation and Ammortization</td>
</tr>
<tr>
<td>E</td>
<td>Equity</td>
</tr>
<tr>
<td>IB</td>
<td>Income before extraordinary item</td>
</tr>
<tr>
<td>LCT</td>
<td>Current Liabilities</td>
</tr>
<tr>
<td>MKT CAP</td>
<td>Market Capitalization</td>
</tr>
<tr>
<td>NET LEV</td>
<td>Net Leverage</td>
</tr>
<tr>
<td>PPE</td>
<td>Property, Plant and Equipment</td>
</tr>
<tr>
<td>S</td>
<td>Net Sales</td>
</tr>
<tr>
<td>TA</td>
<td>Total Assets</td>
</tr>
<tr>
<td>TD</td>
<td>Total Debt</td>
</tr>
<tr>
<td>Q</td>
<td>Tobin's Q</td>
</tr>
</tbody>
</table>

\[
\Delta AR_{j,y} = (AR_{j,y}) - (AR_{j,y-1})
\]

\[
\Delta S_{j,y} = (S_{j,y}) - (S_{j,y-1})
\]

Excess Cash = CHE - Max[LCT - (ACT - CHE)]

FC = 1 if the firm is financially constrained; 0 otherwise

HighInvOpp = 1 if the firm is in the top 30% of investment opportunities; 0 otherwise

Inv = CAPEX/LagPPE

InvOpp = Predicted level of investment

Leverage = TD/(TD+E)

MtoB = MKT CAP/E

Net Debt = DLT + DLC - Excess Cash

NET LEV = Net Debt/ (Net Debt + E)

Q = (MKT CAP + DCL + DLT)/TA

ROA = IB/TA

Salesgrowth = \(\Delta S_{j,y}/S_{y-1}\)

TACC = \(\Delta ACT - \Delta CHE - \Delta LCT + \Delta DLC - DP\)

TD = DLT + DLC
The initial sample of firms consists of all nonfinancial companies listed in the 28 Member States of European Union. We collect financial reporting data from Amadeus. Since we require all firms have financial reporting data available in years $y$, $y-1$ and all data available for investment in year $y+1$, we drop all companies with information not available. In order to mitigate the influence of outliers, we trim all variables in Equation (1) and Equation (2) at the 1% and 99% levels by year. We also drop companies in SIC codes between 0111 and 0191 because of the paucity of observations. Our sample consists of 1,313 firm-year observations in 2005 and 2006.
Table 2 presents minimum, maximum, means and standard deviations of the main financial values of our sample. Values are in TH.Euro. Our sample contains 1,313 firm-year observation, of which 449 are financially constrained.
### TABLE 3

**Panel Regression of Discretionary Accruals on Financial Constraints and Investment Opportunities**

\[ DA_{j,y} = \beta_0 + \beta_1 FC_{j,y} + \beta_2 InvOpp_{j,y} + \beta_3 FC_{j,y} \times InvOpp_{j,y} + \beta_4 MtoB_{j,y} + \beta_5 SalesGrowth_{j,y} + \epsilon \]

Panel A: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>DA</th>
<th>FC</th>
<th>InvOpp</th>
<th>FC*InvOpp</th>
<th>MtoB</th>
<th>SalesGrowth</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC</td>
<td>0.103</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>InvOpp</td>
<td>0.005</td>
<td>-0.124</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC*InvOpp</td>
<td>0.019</td>
<td>0.560</td>
<td>0.308</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MtoB</td>
<td>0.042</td>
<td>-0.101</td>
<td>0.151</td>
<td>0.015</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SalesGrowth</td>
<td>0.060</td>
<td>-0.103</td>
<td>0.190</td>
<td>-0.109</td>
<td>0.114</td>
<td>1</td>
</tr>
</tbody>
</table>

Panel B: Regression Results

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Predicted Sign</th>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>-0.019</td>
<td>0.006</td>
<td>-3.385</td>
<td>0.001</td>
</tr>
<tr>
<td>FC</td>
<td>+</td>
<td>0.040***</td>
<td>0.009</td>
<td>4.417</td>
<td>0.000</td>
</tr>
<tr>
<td>InvOpp</td>
<td>+/-</td>
<td>0.0004</td>
<td>0.000</td>
<td>0.883</td>
<td>0.378</td>
</tr>
<tr>
<td>FC*InvOpp</td>
<td>-</td>
<td>-0.002*</td>
<td>0.001</td>
<td>-1.920</td>
<td>0.055</td>
</tr>
<tr>
<td>MtoB</td>
<td>+</td>
<td>0.001*</td>
<td>0.001</td>
<td>1.738</td>
<td>0.082</td>
</tr>
<tr>
<td>SalesGrowth</td>
<td>+</td>
<td>0.017**</td>
<td>0.009</td>
<td>2.018</td>
<td>0.044</td>
</tr>
<tr>
<td>Adj. R Square (%)</td>
<td>1.70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sign.</td>
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<td></td>
<td></td>
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Table 3 presents panel regression of discretionary accruals on financial constraints and investment opportunities. Panel A reports Pearson correlation among the variables used in Equation (3). Panel B reports regression results. \( DA_{j,y} \) is performance-adjusted discretionary accruals, estimated with the modified-Jones model; \( FC_{j,y} \) is a binary variable equals to 1 if the firm is financially constrained and 0 otherwise; \( InvOpp_{j,y} \) is the predicted value of investment, estimated in Equation (2); \( FC_{j,y} \times InvOpp_{j,y} \) measures the investment opportunities of financially constrained companies; \( MtoB_{j,y} \) is market capitalization deflated by the book value of equity; \( SalesGrowth_{j,y} \) is the change in sales in year \( y \) deflated by sales in year \( y-1 \). The symbols *** , ** , and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.
Panel Regression of Discretionary Accruals on Financial Constraints and High Investment Opportunities

\[ DA_{j,y} = \beta_0 + \beta_1 FC_{j,y} + \beta_2 HighInvOpp_{j,y} + \beta_3 FC_{j,y} \times HighInvOpp_{j,y} + \beta_4 MtoB_{j,y} + \beta_5 SalesGrowth_{j,y} + \epsilon \]

Panel A: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>DA</th>
<th>FC</th>
<th>HighInvOpp</th>
<th>FC*HighInvOpp</th>
<th>MtoB</th>
<th>SalesGrowth</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC</td>
<td>0.103</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>HighInvOpp</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>FC*HighInvOpp</td>
<td>0.407</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MtoB</td>
<td>0.016</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SalesGrowth</td>
<td>0.114</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Regression Results

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Predicted Sign</th>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
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<tr>
<td>Intercept</td>
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<td>-0.021</td>
<td>0.006</td>
<td>-3.700</td>
<td>0.000</td>
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<tr>
<td>FC</td>
<td>+</td>
<td>0.037***</td>
<td>0.008</td>
<td>4.643</td>
<td>0.000</td>
</tr>
<tr>
<td>HighInvOpp</td>
<td>+/-</td>
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<td>0.009</td>
<td>1.483</td>
<td>0.138</td>
</tr>
<tr>
<td>FC*HighInvOpp</td>
<td>-</td>
<td>-0.033**</td>
<td>0.017</td>
<td>-2.018</td>
<td>0.044</td>
</tr>
<tr>
<td>MtoB</td>
<td>+</td>
<td>0.001</td>
<td>0.001</td>
<td>1.581</td>
<td>0.114</td>
</tr>
<tr>
<td>SalesGrowth</td>
<td>+</td>
<td>0.018**</td>
<td>0.008</td>
<td>2.145</td>
<td>0.032</td>
</tr>
</tbody>
</table>

**Adj. R Square (%)** 1.70%

**F** 5.63

**Sign.** 0.000

**Observations** 1,313

Table 4 presents Panel Regression of Discretionary Accruals on Financial Constraints and High Investment Opportunities. Panel A reports Pearson correlation among the variables used in Equation (4). \( DA_{j,y} \) is performance-adjusted discretionary accruals, estimated with the modified-Jones model; \( FC_{j,y} \) is a binary variable equals to 1 if the firm is financially constrained and 0 otherwise; \( HighInvOpp_{j,y} \) is a binary variable equals to 1 if the firm has high investment opportunities and 0 otherwise; \( FC_{j,y} \times HighInvOpp_{j,y} \) is a binary variable equals to 1 if the firm is a financially constrained company with high investment opportunities and 0 otherwise; \( MtoB_{j,y} \) is market capitalization deflated by the book value of equity; \( SalesGrowth_{j,y} \) is the change in sales in year \( y \) deflated by sales in year \( y-1 \). The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.
TABLE 5

Income-decreasing discretionary accruals and deviation from efficient investment

\[
Prob(\text{Inv}_{j,y+1} = j) = \beta_1 \text{NegDA}_{j,y} + \beta_2 \text{HighFRQ}_{j,y} + \beta_3 \text{Slack}_{j,y} + \beta_4 \text{Tang}_{j,y} + \beta_5 \text{Kstruct}_{j,y} + \epsilon
\]

Panel A: under-investment versus efficient investment

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Coeff.</th>
<th>Std.Error</th>
<th>Sign.</th>
<th>Exp (coeff.)</th>
<th>95% C.I. lower</th>
<th>95% C.I. upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neg_DA</td>
<td>-1.108***</td>
<td>0.319</td>
<td>0.001</td>
<td>0.330</td>
<td>0.177</td>
<td>0.618</td>
</tr>
<tr>
<td>High_FRQ</td>
<td>-1.601***</td>
<td>0.291</td>
<td>0.000</td>
<td>0.202</td>
<td>0.114</td>
<td>0.357</td>
</tr>
<tr>
<td>Slack</td>
<td>-0.493</td>
<td>0.314</td>
<td>0.117</td>
<td>0.611</td>
<td>0.330</td>
<td>1.131</td>
</tr>
<tr>
<td>Tang</td>
<td>-1.245*</td>
<td>0.724</td>
<td>0.086</td>
<td>0.288</td>
<td>0.070</td>
<td>1.190</td>
</tr>
<tr>
<td>Kstruc</td>
<td>-1.404*</td>
<td>0.837</td>
<td>0.094</td>
<td>0.246</td>
<td>0.048</td>
<td>1.267</td>
</tr>
</tbody>
</table>

Obs. 449
Sign. 0.000

Pseudo R square 0.56

Continues on the next page...
Table 5 presents results from multinomial logit regression in which the dependent variable captures the deviation from the predicted level of investment, measured as the residual of Equation (2). We sort companies in nine clusters based on the level of investment deviation reported in year $y+1$. The benchmark cluster is those that groups companies with level of investment deviation close to zero (i.e., invest in efficient manner). The dependent variable takes value of 1 if the firm is classified as under-investing, 2 if the company is in the benchmark group and 3 if the firm is classified as over-investing. The independent variable of interest is $NegDA_{j,y}$, which takes value of 1 if the company is in the bottom quartile of discretionary accruals and 0 otherwise. $HighFRQ_{j,y}$ is a dummy variable equals to 1 if the company is in the middle quartiles of discretionary accruals and 0 otherwise. $Slack_{j,y}$ is the ratio of cash to PPE; $Tang_{j,y}$ is the ratio of PPE to Total Assets; $Kstruct_{j,y}$ is the ratio of long term debt to the sum of long term debt and the market value of equity. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.
Table 6 presents results from logit regression in which the dependent variable is a dummy variable equals to 1 if the firm is the bottom quartile of investment deviation, measured as the residual of Equation (2), and 0 otherwise. \( NegDA_{j,y} \) takes value of 1 if the company is in the bottom quartile of discretionary accruals and 0 otherwise. \( HighFRQ_{j,y} \) is a dummy variable equals to 1 if the company is in the middle quartiles of discretionary accruals and 0 otherwise. \( Slack_{j,y} \) is the ratio of cash to PPE; \( Tang_{j,y} \) is the ratio of PPE to Total Assets; \( Kstruct_{j,y} \) is the ratio of long term debt to the sum of long term debt and the market value of equity. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.