September 27, 2012

Can Managers Use Discretionary Accruals to Ease Financial Constraints? Evidence from Discretionary Accruals Prior to Investment[*]

James S. Linck[a], Jeffry Netter[b], and Tao Shu[b]

[a]Cox School of Business, Southern Methodist University
Dallas, TX 75275, (214) 768-3933

[b]Terry College of Business, University of Georgia
Athens, GA 30602, 706 542-4450
jlinck@cox.smu.edu
jnetter@terry.uga.edu
taoshu@terry.uga.edu

[*] We appreciate the comments from Steve Baginski, Murillo Campello, Annette Poulsen, Vernon Richardson (Editor), Richard Sloan, Eric P. Yeung, two anonymous referees, and seminar participants at the Southern Methodist University.

September 27, 2012

Can Managers Use Discretionary Accruals to Ease Financial Constraints? Evidence from Discretionary Accruals Prior to Investment

Abstract

Despite a large literature on discretionary accruals, how the use of discretionary accruals impacts corporate financial decisions is not well understood. We hypothesize that a financially constrained firm with valuable projects can use discretionary accruals to credibly signal positive prospects, enabling it to raise capital to make the investments. In this situation, discretionary accruals help "correct" the market misvaluation of the firm's investment prospects. We evaluate our hypotheses with a large panel of firms during 1987 to 2009. We find that financially constrained firms with good investment opportunities have significantly higher discretionary accruals in the two quarters prior to investment compared to their unconstrained counterparts. Constrained high-accrual firms have higher earnings-announcement returns than constrained low-accrual firms, obtain more equity and debt financing, and appear to invest in valuable projects. These results provide supporting evidence that the use of discretionary accruals can help constrained firms with valuable projects ease the constraints and increase firm value.

JEL Classification: G31

Keywords: Financial constraints, discretionary accruals, investment, signaling, valuation, capital raising.

1. Introduction

Despite a large literature on discretionary accruals and earnings management, there is little analysis of how discretionary accruals impact corporate financial decisions. We hypothesize and test whether a firm's strategic accrual reporting can ease financial constraints caused by market undervaluation of a firm's investment prospects. Thus, we examine whether discretionary accruals can be used to help the constrained firm fund valuable investment. We distinguish our paper from much of the earnings management literature in line with Healy and Wahlen's (1999, p. 369) comment, "decisions to use accounting judgment to make financial reports more informative for users do not fall within our definition of earnings management." That is, we use the term discretionary accruals throughout this paper to reflect decisions to improve information rather than as an attempt to obfuscate a firm's activities as much of the earnings management literature suggests.

We hypothesize that if a firm is financially constrained but has valuable projects, the firm can use discretionary accruals to signal its positive prospects and raise its stock price in the short run. Thus, signaling enables the firm to raise capital to fund its projects. While using discretionary accruals is costly, a financially constrained firm with valuable projects may choose to use discretionary accruals to alleviate its financing constraints.[1] Though the signal is costly, which is necessary for it to be credible, it enables the firm to raise capital for efficient investment. Thus, we hypothesize that the strategic use of discretionary accruals is, in this case, consistent with value maximization.

[1] Previous studies suggest that earnings management is costly to a firm through excess tax expenses (Trueman and Titman 1988; Chaney and Lewis 1995), disruption of operation (Dye 1988), and litigation costs (DuCharme, Malatesta, and Sefcik 2004).

To test the hypothesis we empirically examine a large panel of firms from 1987 to 2009 using multiple measures of financial constraints. We find that financially constrained firms with good investment opportunities, compared to their unconstrained counterparts, have significantly higher discretionary accruals prior to investment. Constrained firms with high discretionary accruals experience higher earnings-announcement returns, obtain more equity and debt financing, and invest more than constrained firms with low accruals. Further, constrained firms with high discretionary accruals exhibit improved performance after their investments, while their unconstrained counterparts exhibit either negative or no change in performance. These results provide supporting evidence that financially constrained firms use discretionary accruals to ease financial constraints, and increase firm value by investing in valuable projects.

We start the empirical analysis by examining discretionary accruals prior to investment for financially constrained firms. We follow the literature and measure discretionary accruals using abnormal accruals estimated via the modified Jones model, adjusted for past performance using the methodology described in Kothari et al. (2005).[2] We carefully identify financially constrained firms using a broad set of constraint measures. Previous studies have proposed a number of constraint measures without directly examining their validity. In a recent paper, Hadlock and Pierce (2010) directly examine the reliability of constraint measures proposed in the literature using hand-collected information from financial statements. They find that leverage and cash flows, and particularly firm size and firm age, are useful predictors of financial constraints. Based on the previous literature and

[2] We repeat our tests with the alternative measure of abnormal accruals based on the cash flow statement (Hribar and Collins 2002) and find similar results.

especially Hadlock and Pierce, we use four measures of financial constraints for our main results. Specifically, the first three measures are the SA Index (a metric proposed by Hadlock and Pierce based on firm size and firm age), net leverage (Kaplan and Zingales 1997; Hadlock and Pierce 2010), and free cash flows (Fazzari, Hubbard, and Petersen 1988; Dechow, Sloan, and Sweeney 1996; Hadlock and Pierce 2010). Our fourth measure is a composite constraint score that combines the above measures and three other constraint measures proposed by the literature including bond rating (Almeida, Campello, and Weisbach 2004; Campello and Graham 2010), dividend pay-out ratio (Almeida et al. 2004; Campello and Graham 2012), and operating cash flows (Fazzari et al. 1988; Hadlock and Pierce 2010).[3]

We simultaneously classify firms into groups of financial constraints and investment opportunities, and examine their discretionary accruals in the quarters preceding investment. We find that, with all the constraint measures, financially constrained firms with good investment opportunities have significantly positive abnormal accruals in the quarters preceding investment. Further, their abnormal accruals are significantly larger than their unconstrained counterparts.[4] This finding is consistent with the view that firms with valuable projects, but are financially constrained, use discretionary accruals to ease their constraints.

We also examine whether the use of discretionary accruals facilitates capital raising

[3]For robustness, we also measure financial constraints using the bond rating, dividend payout ratio, and operating cash flows separately, as well as several other firm metrics including the current ratio, quick ratio, and interest coverage ratio, and two alternative constructions of constraint scores. As discussed later in the paper, the results based on these alternative constraint measures are consistent with our main results.

[4] Since growth can simultaneously drive financial constraints and discretional accruals, we repeat our tests with an alternative measure of abnormal accruals that controls for both past performance and sales growth as proposed by Pungaliya and Vijh (2009) and obtain similar results. We also control for book-to-market ratios and sales growth in regressions to control for growth.

for financially constrained firms. We find that high-accrual 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 evidence suggests that the use of discretionary accruals has a positive impact on stock prices of constrained firms. Further, we directly examine the external financing for constrained firms and find that high-accrual firms issue significantly more equity and borrow significantly more than low-accrual firms in the quarters preceding investment.[5]

Finally, we examine whether the use of discretionary accruals facilitates the investments of constrained firms, and whether these investments appear to be in valuable projects. We find that constrained high-accrual firms do indeed invest significantly more than constrained low-accrual firms. We also find evidence of improved performance for constrained firms that use discretionary accruals to facilitate investments. Specifically, ROA for constrained firms with higher accruals prior to investment significantly improves after the investment period, a result we do not observe for the unconstrained firms.

Overall, our results are consistent with the view that some firms use discretionary accruals to reduce information asymmetry, signal positive prospects, and ease financial constraints, which allows them to raise the capital necessary for investment. Further, these investments appear to be in valuable projects, on average. Our findings contribute to the literature that suggests accruals can be used to signal positive prospects and mitigate a market friction (e.g., Chaney and Lewis 1995; Subramanyam 1996; Louis and Robinson 2005).

[5] Our finding on equity issuance is consistent with the literature that firms increase accruals in advance of raising capital (e.g., Rangan 1998; Teoh, Welch, and Wong 1998 a,b; Dechow, Ge, Larson and Sloan 2010). However, these findings are not universal. For example, while Teoh et al. (1998) and Dechow et al. (2010) suggest that earnings management does impact stock performance, Shivakumar (2000) suggests that earnings management does not affect the stock price prior to an SEO.

Our work also contributes to our understanding of the real effects of discretionary accruals on corporate decisions. Two recent papers document a positive relation between corporate investments and earnings management in the form of *financial misreporting*. McNichols and Stubben (2008) examine a sample of 203 earnings restatements, 208 SEC investigations, and 512 litigations, and suggest that financial misreporting discourages interventions from related parties such as the board or external capital suppliers to curb over-investment.[6] Kedia and Philippon (2009) examine 396 earnings restatements and suggest that managers use both earnings management and excessive investments to hide negative prospects from investors. We differ from these papers by showing that firms can use discretionary accruals to make disclosures more informative. Specifically, optimistic managers with valuable projects, yet facing financial constraints, may use discretionary accruals to convey information to the market, easing constraints and allowing them to efficiently increase investment.

Our research also contributes to the literature on earnings quality. Biddle, Hilary, and Verdi (2009) find a positive relation between the quality of firms' financial reporting and the efficiency of their capital investments. Using several measures of earnings quality, they find that the relation between reporting quality and investment is negative for those firms that are likely to over-invest (cash rich and unlevered), but positive for those firms likely to under-invest (cash constrained or highly levered).

Our paper finds that the strategic use of discretionary accruals increases investment

[6] McNichols and Stubben (2008) find similar patterns of "over-investment" in firms with low and high levels of external financing. Even if this result is true in our setting, it does not imply that financial constraints do not matter. That is, it may be that financially constrained firms manage earnings to obtain the same access to the capital markets as unconstrained firms, who did not need to signal positive prospects to the market by managing earnings.

efficiency for firms that have investment opportunities but face financial constraints. At first glance this finding appears to contradict the observed positive relation between earnings quality and investment efficiency (Biddle et al. 2009) because discretionary accruals can reduce earnings quality. However, as defined by Dechow, Ge, and Schrand (2010, p.344), higher quality earnings "provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision maker." For financially constrained firms with positive NPV projects, discretionary accruals can be used to signal positive prospects and thus, *improve* earnings quality. Our findings not only confirm the observed positive relation between earnings quality and investment efficiency, but also illustrate an important message of Dechow et al. (2010, p.344) that the meaning and the measures of earnings quality are "contingent on the decision context."

The rest of this paper is organized as follows. Section 2 develops our hypotheses and discusses the related literature. Section 3 reviews the data and research methods. We present our empirical results in Section 4 and conclude in Section 5.

2. Literature and hypothesis development

2.1 Hypotheses

We hypothesize that financially constrained firms with valuable projects will 1) use accruals to signal positive prospects to be able to access external capital, and 2) use that capital to undertake valuable projects. Thus, we hypothesize that discretionary accruals can allow a firm to undertake efficient investment. Distinct from much earnings management research that suggests managers use discretionary accruals opportunistically, we hypothesize that managers are able to use accruals to signal positive prospects and maximize value for

investors.

This is not the first paper to suggest that discretionary accruals can be used as a signal in the presence of information asymmetry. For example, Chaney and Lewis's (1995) model shows that when there is information asymmetry between investors and managers, the strategic management of reported earnings can reveal information about the firm and positively impact the stock price for the firms that are otherwise undervalued. Theoretical models in Guay, Kothari, and Watts (1996), Demski (1998), and Arya, Glover, and Sunder (2003) also suggest that managers could use managed earnings to signal private information. Subramanyam (1996) finds that stock returns and unexpected accruals are correlated, concluding that discretionary accruals signal managers' private information. Louis and Robinson (2005) find that managers use accruals prior to stock splits to signal private information because the stock split lends credibility to the accrual signal. They find evidence that the market views the pre-split abnormal accruals as signaling managerial optimism rather than opportunism.

Consistent with this literature that suggests accruals can be used as a signal, we consider a simple framework where firms maximize (long-term) value but face short-term information asymmetry between the firms and investors. Specifically, firms know whether they have a positive NPV project but investors do not, and firms with positive NPV projects need external financing to fund the project. A firm's earnings can be high (*H*) or low (*L*). If earnings are high (low), then investors view the firm's prospects as positive (negative), and are (are not) willing to provide funding to the firm. That is, unconstrained firms have high earnings and constrained firms have low earnings. However, a constrained firm can use discretionary accruals to move its earnings from low to high allowing for access to external

financing. Since the use of discretionary accruals is costly (e.g., Dye 1988; Trueman and Titman 1988; Chaney and Lewis 1995; DuCharme et al. 2004), constrained firms will only use discretionary accruals to maximize value if they have projects sufficiently valuable to outweigh the costs. Thus, constrained firms without positive prospects will not mimic those firms with positive prospects. Further, unconstrained firms will have no incentive to use discretionary accruals since they are already unconstrained; thus, they derive no benefits from using discretionary accruals.

2.2 Related literature

In their review of the earnings management literature, Healy and Wahlen (1999, p. 366) argue that: "standards must permit managers to exercise judgment." This allows managers to convey information to the market that best matches the firm's economic situation, possibly increasing the value of accounting information. Our paper lies in the context that firms can use discretionary accruals to convey private information and maximize value. Although the current literature largely refers to discretionary accruals to as earnings management, we will generally use the term "discretionary accruals" as opposed to "earnings management" because the term "earnings management" often has a negative connotation, suggesting the reported numbers do not accurately reflect a firm's underlying economics.

In a related paper, McNichols and Stubben (2008) point out that despite the large literature on earnings management, there has been little research on the relation between earnings management and internal decision making. They find that firms with misreported earnings over-invest during the misreporting period, and suggest that misreporting distorts

information used by a firm's investment decision makers.[7] Our objectives are different from McNichols and Stubben (2008) as we focus on financially constrained firms and hypothesize that financial constraints significantly impact a firm's motivation for managing acccruals. While we find evidence that financially constrained firms use discretionary accruals to ease constraints and invest in valuable projects, this mechanism and the mechanism proposed in McNichols and Stubben are not mutually exclusive. For example, we find that financially *unconstrained* firms also have high discretionary accruals prior to investments (although much less so than constrained firms), and their investments do not seem to improve performance. These results are generally consistent with the information distortion mechanism suggested by McNichols and Stubben (2008).

Our hypothesis that financial constraints increase the firm's motivation for accrual management is related to the literature on factors that affect the firms' accounting practices. Dechow et al. (1996) examine 96 firms subject to accounting enforcement actions by the SEC and conclude that attracting external financing is an important motivation for earnings manipulation.[8] Further, Rangan (1998), Teoh et al. (1998 a, b), and Dechow, Ge, Larson and Sloan (2010) also find evidence that firms manage accruals in advance of raising capital.

Our hypothesis that constrained firms can use discretionary accruals to improve investment efficiency is also related to the literature that examines how accounting choices affect corporate investments. For example, Jackson, Liu, and Gecchini (2009) observe that

[7] The misreporting sample in McNichols and Stubben includes firms that face major law suits or restate their financial statements. They also find similar results using discretionary revenues (Stubben 2010) or discretionary accruals.

[8] However, they suggest that their sample selection procedure "limits the generalizability of our results to more subtle cases of earnings manipulation, such as earnings management within the bounds of GAAP." In addition, they do not examine the effect of earnings management on investment decisions.

firms that use accelerated depreciation make larger capital expenditures than firms that use straight-line depreciation. Li and Tang (2008) also examine whether earnings management — measured by discretionary accruals — affects future capital investment. They find that capital investment is less sensitive to cash flows for firms with large positive discretionary accruals, and conclude that these firms misallocate resources.

Our study is also related to the earnings quality literature. DeChow, Ge, and Schrand's (2010) survey paper examines various measures of earnings quality, their variability, and the consequences of the earnings quality measured by these proxies. They suggest that one must consider the specific context in examining earnings quality because "*quality* is contingent on the decision context (p.344)." In line with this suggestion, we consider the decision context in analyzing the effects of abnormal accruals of our sample firms. Specifically, for financially constrained firms with valuable projects, accruals can be used to signal positive prospects and thus *improve* earnings quality. Thus, our hypothesis is consistent with previous findings that higher earnings quality could increase the firm's investment efficiency (Biddle et al. 2009).

Finally, our paper is related to Campello and Graham (2012), who find that high stock prices can affect corporate financial policies by relaxing financial constraints. Specifically, they argue that the high stock prices observed during the "technology bubble" allowed financially constrained firms to issue equity, using the proceeds to invest. The high stock prices ease financial constraints and facilitate investment, generating welfare-increasing effects. This research aligns well with our work because we suggest earnings management can raise a firm's stock price, easing financial constraints and allowing for investment that may not otherwise be undertaken.

3. Data and research methods

Our sample is the overlap of the Compustat and CRSP databases from 1987 to 2009. For the CRSP data, we include only firms that are ordinary common shares (share code 10 or 11). We drop financial firms (SIC Codes between 6000 and 6999) because their capital structure and investment policy are significantly different from other industries. We require a firm to have sufficient Compustat data to compute quarterly discretionary accruals and annual measures of financial constraints, which are described below.

We follow the literature to calculate quarterly discretionary accruals using the modified Jones model, adjusting for past performance as recommended by Kothari, Leone, and Wasley (2005, hereafter KLW).[9] Specifically, for each industry-year (two-digit SIC industry), we estimate the following regression for all Compustat firms:[10]

$$TA_i = \sum_{j=1}^{4} \alpha_j Q_j + \lambda_1(\Delta Sales_i - \Delta AR_i) + \lambda_2 PPE_i + \varepsilon_i \,, \qquad (1)$$

where TA_i is total quarterly accrual of firm *i*, defined as the change in non-cash current assets (change in ACTQ minus change in CHEQ) minus the change in current liabilities (LCTQ) plus the change in debt in current liabilities (DLCQ) minus depreciation (DPQ). Q_j is a binary variable that equals one for quarter *j* and zero otherwise. $\Delta Sales_i$ is the quarterly change in net sales (SALEQ) for firm *i*, ΔAR_i is the quarterly change in accounts receivable (RECTQ), and PPE_i is property, plant, and equipment (PPENTQ). The regression residual, ε_i, captures

[9] Dechow, Sloan, and Sweeney (1995) suggest that modified-Jones model provides the most powerful test for detecting earnings management as compared to other discretionary accruals' models. However, our inferences are not changed when we use Jones model instead of the modified-Jones model. We also measure accruals based on items of the cash flow statement per Hribar and Collins (2002) and get similar results.

[10] Following the literature, we require an industry-year to have at least ten firms.

discretionary accruals. All variables, including the binary variables, are scaled by total assets at the beginning of the quarter (lagged ATQ). We winsorize all scaled variables at the 1st and 99th percentiles to control for outliers, as suggested by KLW.

Following KLW, we adjust discretionary accruals for past accounting performance. Specifically, in each quarter we divide firms within a two-digit SIC industry into ROA quartiles measured four quarters prior to the accrual quarter. We then calculate abnormal accruals for each firm-quarter as the firm's discretionary accrual minus the average discretionary accrual of other firms in the benchmark quartile. We use these performance-adjusted abnormal accruals in all our tests.

Following the literature (e.g., Kaplan and Zingalas 1997; Campello and Graham 2012), we construct quarterly investment as quarterly capital expenditures (CAPXY) scaled by property, plant and equipment (PPENTQ) at the beginning of the quarter.[11]

3.1. Definition of constrained firms

Identifying financially constrained firms ex ante is a difficult endeavor, and there is no universally accepted way to measure constraints. Previous studies have proposed a number of constraint measures, but there has been little empirical research examining the reliability of these measures. In a recent paper, Hadlock and Pierce (2010) identify financially constrained firms based on hand-collected information from financial statements, and thoroughly test the reliability of the constraint measures proposed by the literature. They find that leverage, cash flows, and particularly firm size and firm age are useful predictors of

[11] Since the Compustat variable of quarterly capital expenditures (CAPXY) is a year-to-date value, we convert it to a quarterly value for the second to the fourth quarters of a year by subtracting its lagged value. We also conduct robustness tests using a company's investing cash flows instead of capital expenditures to measure investments, and observe similar results.

financial constraints. They propose a measure of constraints, the *SA Index*, based solely on firm size and firm age. As our intention is not to develop and test new financial constraint measures, we rely on the existing literature, including Hadlock and Pierce (2010), and use four measures to identify financially constrained firms. However, for robustness, we also examine several other proxies that have been suggested in the literature. We construct the constraint measures at the annual level, consistent with the literature from which we extract them.

Our first three constraint measures are: 1) *SA Index* (Hadlock and Pierce 2010): We follow Hadlock and Pierce and calculate SA Index as $-0.737\times\text{Size} + 0.043\times\text{Size}^2 - 0.040\times\text{Age}$, where size is the natural log of book assets (in million dollars).[12] Firms in the bottom (top) 30% of SA Index are considered unconstrained (constrained). 2) *Net leverage* (Kaplan and Zingales 1997; Hadlock and Pierce 2010): We calculate net leverage as net debt (summation of long-term and short-term debt minus excess cash) scaled by the sum of net debt and shareholder's equity. Firms with negative net debt (39% of sample firms) are considered unconstrained. Then within the remaining firms with positive net debt, the top 50% firms (31% of sample firms) are considered constrained.[13] 3) *Free cash flow* (Dechow et al. 1996; Hadlock and Pierce 2010): Firms in the top (bottom) 30% of free cash flow are considered unconstrained (constrained), where free cash flow is cash from operations minus average capital expenditure in the past three years, scaled by the sum of long-term and short-term debt. Negative free cash flow suggests that the firm's internal cash flow is insufficient

[12] Age of a firm is the number of years from the first year that a firm has a nonmissing stock price in Compustat. We follow Hadlock and Pierce to winsorize book assets at $4.5 billion and age at 37 years.

[13] For robustness, we also repeat the tests using raw leverage instead of net leverage, where raw leverage is constructed using total debt instead of net debt. We observe similar results using raw leverage.

to support investment.[14]

Our fourth constraint measure is a comprehensive constraint score that captures the above three firm metrics and three other metrics including bond rating (Almeida et al. 2004; Campello and Graham 2012), dividend pay-out ratio (Almeida et al. 2004; Campello and Graham 2012), and operating cash flows (Fazzari et al. 1988; Hadlock and Pierce 2010). Specifically, we first follow the literature and use each of the six metrics to classify firms into constrained and unconstrained groups. For bond ratings, firms with (without) a bond credit rating during our sample period are considered unconstrained (constrained)[15]. For dividend pay-out ratio, firms in the top (bottom) 30% are considered unconstrained (constrained), where the dividend pay-out ratio is the summation of common and preferred dividends scaled by net income. For operating cash flows, firms in the top (bottom) 30% are considered unconstrained (constrained), where operating cash flow is the summation of income before extraordinary items and depreciation, scaled by lagged property, plant and equipment. Then, for a firm-year, we examine each of the six criteria and assign one point if it is classified as constrained by the criterion and zero point otherwise. We then calculate the "constraint score" as the total number of points for the firm-year based on the six criteria. Firm-years with constraint scores higher than or equal to 3 are classified as constrained (31% of sample firms), while firm-years with constraint scores lower than or equal to 1 are classified as unconstrained (39% of sample firms). The details of the constraint measures are

[14] This measure is the same as the "ex ante finance" measure in Dechow et al. (1996) except that they scaled this measure by lagged current assets. For robustness, we also repeat the tests using the free cash flows measure scaled by lagged current assets, and obtained similar results. The results are also similar if we scale by total liabilities instead of total debt.

[15] Following Almeida et al. (2004), we classify a firm-year as unconstrained if in the given year the firm has no bond rating but also no debt.

described in the Appendix.

For robustness, we also examine, but do not tabulate, results using financial constraints based on the bond rating, dividend payout ratio, and operating cash flows separately as well as several other firm metrics including quick ratio, current ratio, and interest coverage ratio. We also construct composite constraint scores using two alternative methods: 1) one that includes only the three main constraint metrics (SA Index, net leverage, and free cash flow); and 2) one that includes the current six constraint score components plus quick ratio, current ratio, and interest coverage ratio. We obtain similar results with these alternative measures.

3.2. Summary statistics

Panel A of Table 1 provides summary statistics for our key metrics. Although we have accounting data beginning in 1987, our sample period runs from the third quarter of 1989 to the fourth quarter of 2009 because we require lagged data to construct the accrual and constraint measures. Our final sample contains 240,940 firm-quarters. In Panel B we report the correlations among our four measures of financial constraints as well as the three additional components of our constraint score. Correlations between the binary constraint measures are positive except that the measure based on *Net Leverage* is negatively correlated with *SA Index* (-0.367), *Credit Rating* (-0.017), and *Pay-out Ratio* (-0.270). These results suggest that net leverage might capture different aspects of constraints than some other measures. Additionally, the measure based on *Operating Cash Flows* is also negatively correlated with *Pay-out Ratio* (-0.165). The highest correlation is between *Free Cash Flows* and *Operating Cash Flows*, which is 0.723. While the correlations are all statistically

significant at the standard levels, many are relatively low economically and some are negative, which illustrates the challenge in identifying whether a firm is truly constrained or not. This may reduce the power of our tests. Further, our conclusions are subject to the caveat of whether or not our measures actually capture financial constraints.

4. Empirical results

We first examine whether abnormal accruals prior to investment are higher for constrained firms with good investment opportunities compared to their unconstrained counterparts. We then investigate the mechanisms through which higher accruals may ease financial constraints. Specifically, we test whether the use of discretionary accruals indeed leads constrained firms to experience higher announcement returns, raise more funding, and invest more. Finally, we examine performance for firms that use discretionary accruals to ease constraints and invest.

4.1 Do financially constrained firms manage accruals in the quarters prior to investment?

Our hypothesis suggests that constrained firms manage accruals to ease financial constraints and then invest. Thus, it is important that we evaluate financial constraints in advance of accruals and accruals in advance of investments. While accruals and investments are on a quarterly basis, we only measure financial constraints on an annual basis to follow the literature that proposes these measures.[16] More importantly, the annual measures work well with our test design because we need to measure constraints prior to measuring accruals. Thus, we use annual measures for all our constraint proxies to be consistent across measures,

[16] Futher, some of the data such as credit rating are not available at the quarterly level.

to fit in our test design, and to be consistent with the prior literature.

We illustrate the time-line of our empirical measures in Figure 1. For each investment quarter *q*, we examine average abnormal accruals of *q*-2 and *q*-1. Firms typically announce *q*-2 earnings during *q*-1, and *q*-1 earnings during the investment quarter *q*.[17] Thus, both *q*-2 and *q*-1 accruals may ease financial constraints for quarter *q* investment. We examine external financing in quarters *q*-1 and *q*. We measure whether the firm is financially constrained at least two quarters prior to when we measure investments. Specifically, if the investment quarter *q* is the first or second quarter of year *y*, then we use the annual constraint measures as of *y*-2. Otherwise, we use the annual constraint measures as of *y*-1.

We measure the firm's investment opportunities at least two quarters prior to the investment quarter with the following regression (Kaplan and Zingales 1997)[18]:

$$Inv_{i,q} = \alpha_0 + \alpha_1 CFO_{i,y} + \alpha_2 Q_{i,y} + \alpha_3 Lev_{i,y} + \alpha_4 Div_{i,y} + \alpha_5 Cash_{i,y} + \alpha_6 SalesGrowth_{i,y} + \alpha^j Ind_j, \quad (2)$$

where $Inv_{i,q}$ is investment of firm *i* in quarter *q*. The independent variables include cash flows (*CFO*), Tobin's Q (*Q*), leverage (*Lev*), dividends payment (*Div*), cash holdings (*Cash*), sales growth (*SalesGrowth*), and dummy variables for two-digit industries (*Ind*). All the independent variables are at the annual level and are measured as of *y*-2 (*y*-1) if *q* is the first or second (third or fourth) quarter of the year. Details of these variables are described in the Appendix. We estimate a cross-sectional regression in each quarter *q* and calculate investment opportunities as the predicted value of the regressions.

[17] For our sample, 98.7% of the *q*-2 earnings are announced during *q*-1, and 98.3% of the *q*-1 earnings are announced during the investment quarter *q*.

[18] For robustness, we also measure investment opportunities using actual industry-adjusted investment with similar results.

We first examine abnormal accruals for firms sorted on investment opportunities and our financial constraint measures. For each investment quarter *q*, we double sort firms on investment opportunities and each of the four constraint measures: SA Index, net leverage, free cash flows, and constraint score. We then report the time-series means of average abnormal accruals across quarters *q*-1 and *q*-2 for each two-dimensional group in Table 2. We also report *t*-statistics for differences in accruals estimating using Newey-West robust standard errors with five lags.

Results are reported in Table 2. Looking first at the high investment opportunity firms, abnormal accruals prior to investment are significantly higher for constrained firms than for unconstrained firms for each of our constraint proxies. For example, for the SA-Index constraint proxy, abnormal accruals for constrained high investment firms are 0.63 percentage points higher than that for unconstrained high investment firms (*t*-stat 5.61). In contrast, for low investment opportunity firms, the difference between accruals for constrained and unconstrained firms is either negative or insignificant for most constraint proxies except the SA Index. Further, for constrained firms, accruals prior to investment are higher for high investment opportunity firms than for low investment opportunity firms, and these differences are statistically significant for all constraint proxies.[19]

Therefore, on a univariate basis, it appears that accruals prior to investment are significantly higher for firms that have high investment opportunity but face financial constraints. This provides preliminary evidence consistent with the view that firms use

[19] In untabulated results, we conduct robustness checks using abnormal accruals constructed based on the cash flow statement (Hribar and Collins 2002) and get similar results. We also repeat the analysis using abnormal accruals adjusted for both past performance and sales growth (Pungaliya and Vijh 2009) and observe similar results.

discretionary accruals in advance of investment to ease financial constraints, enabling them to invest.

In Table 3, we estimate panel regressions of abnormal accruals to control for variables other than financial constraints that also affect accruals. The dependent variable is average abnormal accruals from quarters *q*-1 and *q*-2; independent variables include investment opportunities, constraint proxies, and their interaction. If constrained firms with good investment opportunities report higher discretionary accruals prior to investment than do their unconstrained counterparts, we would expect the coefficient of the interaction between investment opportunities and each constraint proxy to be significantly positive.

We control for the book-to-market ratio and sales growth because both McNichols (2002) and Skinner and Sloan (2002) show that growth firms have stronger incentives to manage earnings. We also control for market capitalization, as Watts and Zimmerman (1978, 1990) and Klein (2002) suggest that market capitalization is related to discretionary accruals. For each constraint measure, we present regressions with and without year-quarter fixed effects. We report robust *t*-statistics calculated with clustered standard errors at the year-quarter level. The coefficients on the interactions between investment opportunities and financial constraints are significantly positive for all constraint measures (at the 10 percent level for net leverage). For example, when we measure constraints with constraint score, the coefficient of the interaction between investment and constraint measure is 0.188 (*t*-stat 8.02) in the regressions with year-quarter fixed effects. To summarize, the results in Tables 2 and 3 suggest that constrained firms with good investment opportunities have higher discretionary accruals than their unconstrained counterparts in the two quarters prior to investment.

To test whether our results are sensitive to the investment opportunity measures, we

conduct robustness tests using a number of alternative investment measures: 1) we measure investment using total cash flows from investing activities instead of capital expenditure. Investing cash flows differs from capital expenditure as it nets both cash inflows and outflows related to corporate investments. 2) To distinguish new investment from replacing existing assets [Depreciation & Amortization, (*D&A*)], we estimated investment opportunities by including *D&A* over the past four quarters in equation (2). 3) To address the concern that the investment opportunities measure might be noisy, we also use actual industry-adjusted investment in quarter *q* rather than investment opportunities. In untabulated results of sorting and regression analyses, our findings are robust to using these alternative investment measures.

4.2 How does earnings management ease financial constraint?

One mechanism through which higher accruals may ease financial constraints is by signaling improved prospects to the market, thereby boosting stock price and facilitating external financing. To test this conjecture, we first examine the relation between accruals and stock prices. We report earnings announcement returns for firms double sorted on average abnormal accruals of quarters *q*-2 and *q*-1 and each constraint measure, where the earnings announcement return is the four-day abnormal return in excess of the CRSP value-weighted index return during the [-2, 1] window centered on the quarter *q*-1 and *q*-2 earnings announcement dates, respectively. Table 4 shows that constrained high-accrual firms experience significantly higher earnings announcement returns than their low-accrual counterparts. Unconstrained high-accrual firms also have significantly higher announcement returns than their low-accrual counterparts, but the difference is significantly smaller than

among constrained firms.

Presumably the channel through which accruals impact investment is to facilitate equity and debt financing. Specifically, the use of discretionary accruals can raise the stock price and thereby lower the cost of equity. The higher stock price can also reduce market leverage and facilitate borrowing for constrained firms. Further, high accruals improve a firm's earnings and thus, may alleviate constraints imposed in debt contracts and increase creditors' assessment of the firm's ability to repay. Therefore, we examine whether constrained high-accrual firms raise more equity and debt capital than constrained low-accrual firms.

We follow the literature (e.g., Frank and Goyal 2003) to measure quarterly equity issuance as the sale of common and preferred stocks minus the purchase of common and preferred stocks (both from the statement of cash flows), scaled by total assets of the previous quarter. Our measure of debt financing is the issuance of long-term debt minus reduction of long-term debt (both from the statement of cash flows), scaled by total assets of the previous quarter. To assess the overall effects on financing, we construct a measure of total external (long-term) financing as the summation of equity and debt financing measures. Details of the financing measures are described in the Appendix. We first double sort firms into quintiles of abnormal accruals (averages of quarters q-1 and q-2) and two groups of financial constraints. We then examine total long-term financing in quarters' q-1 and q across the levels of abnormal accruals for constrained firms. The top panel of Table 5 shows that high-accrual constrained firms raise significantly more external financing than low-accrual constrained firms. This pattern holds for all of the four constraint measures.

The middle and the bottom panels of Table 5 present the results on equity issuance

and debt borrowings separately. The results show that the use of discretionary accruals increases both equity and debt financing for constrained firms. For example, for the SA-Index constraint proxy, the spreads between high-accrual and low accrual constrained firms are 0.82% (t-stat 3.35) for equity financing and 0.34% (t-stat 4.60) for debt financing. The effect is generally larger for equity financing in terms of level but larger for debt financing in terms of percentage change.

Next, we examine the relation between abnormal accruals and external financing for constrained firms in a multivariate framework. Table 6 presents panel regressions for financially constrained firms where the dependent variables are total external financing (Panel A), equity issuance (Panels B), and net borrowing through long-term debt (Panel C) in quarters *q* and *q*-1, and independent variables include average abnormal accruals in quarters *q*-1 and *q*-2. We follow Campello and Graham (2012) to further control for cash flows, leverage, Tobin's Q, the dividend ratio, cash holdings, and sales growth. For each constraint proxy, we estimate models with year-quarter fixed effects and report robust *t*-statistics with clustered standard errors within each quarter. The coefficients on accruals are significantly positive in all the regressions, confirming that external financing is increasing in abnormal accruals for constrained firms.

For robustness, we also examine alternative financing measures. For an alternative measure of total financing, we examine total financing cash flows from the cash flow statement, which captures net long-term and short-term financing. Our alternative measure of equity financing is the change in common stock minus the change in retained earnings, scaled by total assets of the previous quarter (Fama and French 2005). For an alternative measure of debt financing, we examine net borrowing through bank loans. Specifically, we

obtain data on corporate loans from Thomson Reuters LPC's DealScan database and calculate net borrowing through bank loans as loans initiated minus loans terminated during the corresponding quarters. In unreported results, the findings based on these alternative measures consistently suggest that high-accrual constrained firms raise more equity and debt financing than low-accrual constrained firms.

Next, to measure the magnitude of the effect of accruals on investment, we compare investment across groups of abnormal accruals for financially constrained and unconstrained firms. Specifically, for each quarter *q*, we sort firms into quintiles of average abnormal accruals for quarters *q*-1 and *q*-2 and constrained versus unconstrained, and report time-series means of average investment for each group in quarter *q*. We also report *t*-statistics for the differences between the highest and the lowest quintiles computed using Newey-West robust standard errors with five lags.

Panel A of Table 7 shows that among constrained firms, investments for the top accrual quintile are higher than for the bottom quintile, and the differences are statistically significant for all constraint proxies. The differences appear economically significant as well. For example, using free cash flows as constraint proxy, high-accrual firms have investment (scaled by total assets) that is 1.6 percentage points higher that low-accrual firms, or 23% (1.6/6.9) higher than that of low-accrual firms. The investments of high-accrual firms are on average 19% higher than those of the low-accrual firms using the four constraint proxies. The same pattern exists for unconstrained firms, although the economic magnitudes are smaller. In Panel B, we examine the abnormal investment calculated as the residual of quarterly regression of investment in equation (2) and observe similar results. Overall, the results in Table 7 are consistent with the view that investment is higher for firms with higher prior

accruals. This pattern is somewhat stronger for constrained firms than for unconstrained firms.

4.3 Does accruals management create value for constrained firms through investing in valuable projects?

Our empirical results suggest that constrained firms manage accruals to ease financial constraints and invest. There is a large literature showing that corporate investments are generally followed by negative performance, suggesting that, on average, firms over-invest. In contrast, our hypotheses suggest that constrained firms manage accruals to lower the cost of funding valuable projects. Therefore, we employ a benchmark-firm technique to examine the changes in performance for constrained firms that appear to manage accruals to improve financing opportunities.

For each quarter *q*, we sort firms simultaneously into quintiles of investment in quarter *q* and average abnormal accruals of quarters *q*-1 and *q*-2. We call "event firms" those that are financially constrained and are in the top quintiles of investment and abnormal accruals. These firms presumably use discretionary accruals to ease financial constraints and invest. We then examine the average quarterly ROA for each year in the six-year window around the investment quarter, where year -1 includes the four quarters from *q*-8 to *q*-5, and year 1 includes the four quarters from *q*+5 to *q*+8. We exclude the four quarters before and after the investment quarter *q* because the ROA for these quarters could be contaminated by accruals management.

For each event firm we choose a constrained non-investment (firms in the bottom four quintiles of investment) matching firm that has the same two-digit SIC code and whose

ROA in year -1 is the closest to the event firm. We then compute abnormal ROA as the difference in ROA between event firm and matching firm.[20] Panel A of Table 8 presents average quarterly ROA in each year around the investment quarter. We calculate the change in performance as the average ROA of the post three-year window [1, 3] minus the average ROA of the pre three-year window [-3, -1]. The change in performance is significantly positive for all constraint proxies. These results are consistent with the view that constrained firms that manage accruals invest in valuable projects.

In Panel B of Table 8, we repeat this test for unconstrained firms. The test design is the same as in Panel A except that both event firms and matching firms are financially unconstrained. Unlike constrained firms, we do not find much evidence of improved performance after investment for the unconstrained sample. The change in performance is significantly positive for only one constraint proxy (net leverage), significantly negative for one proxy (SA Index), and insignificantly negative for the other two proxies. These results suggest that the improved performance after investment is unique to the constrained firms. Panel C presents the difference in performance changes between constrained and unconstrained firms. In this case, all the four differences are positive and three of the four are statistically significant. To summarize, these results are consistent with the view that constrained firms tend to invest in valuable projects when they manage earnings to ease financial constraints and invest.

[20] For robustness, we also repeat the tests with two alternative benchmarking approaches (results untabulated). Specifically, we match each event firm with a constrained firm (in the same industry and with the similar past performance) that is in the bottom four quintiles of abnormal accruals (does not manage earnings), but in the top quintile of investments (make investments). In another approach, we match the event firm with a constrained firm (in the same industry and with similar past performance) that is in the top quintile of abnormal accruals (manage earnings) but in the bottom four quintiles of investments (does not invest). We find similar results in both tests.

5. Conclusion

This paper examines whether accruals are used by financially constrained firms that have good investment opportunities to ease constraints and fund valuable projects. We find that while firms in general have higher accruals in advance of investment, this relation is stronger for financially constrained firms: financially constrained firms having higher abnormal accruals in advance of investment compared to unconstrained firms. We also find that constrained firms experience a greater rise in stock price at their earnings announcements. Additionally, high-accrual constrained firms issue more equity and raise more debt than low-accrual constrained firms. We also document improved post-investment performance for constrained firms that have higher abnormal accruals and invest, but not for their unconstrained counterparts. The results are robust for different measures of financial constraints, discretionary accruals, investments, and external financing.

Overall, our results are consistent with the view that accruals can be used to ease financial constraints, thereby facilitating access to capital for valuable projects. Specifically, abnormally high accruals help mitigate a market friction in which firms have valuable projects but face financial constraints. While accruals management is often viewed as lowering earnings quality, in our setting, it signals positive prospects and improves earnings quality and investment efficiency. Our results illustrate the argument of Dechow et al. (2010) that researchers must consider the context in measuring earnings quality and examining its consequences. Our results contribute to the literature in understanding how accruals management may affect real corporate decisions.

References

Almeida, H., Campello, M., & Weisbach, M. (2004). The cash flow sensitivity of cash. *Journal of Finance*, 59, 1777–1804.

Arya, A., Glover, J., & Sunder, S. (2003). Are unmanaged earnings always better for shareholders? *Accounting Horizons*, 17, 111–116.

Biddle, G., Hilary, G., Verdi, R. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics*, 48, 112–131.

Campello, M., & Graham, J. (2012). Do stock prices influence corporate decisions? Evidence from the technology bubble. *Journal of Financial Economics*, forthcoming.

Chaney, P., & Lewis C. (1995). Earnings management and firm valuation under asymmetric information. *Journal of Corporate Finance*, 1, 319–345.

Dechow, P., Ge, W., Larson, C., & Sloan, R. (2010). Predicting material accounting misstatement. *Contemporary Accounting Research*, forthcoming.

Dechow, P., Sloan R., & Sweeney, A. (1995). Detecting earnings management. *Accounting Review*, 70, 193–225.

Dechow, P., Ge, W., & Schrand, C. (2010) Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50, 344-401.

Dechow, P., Sloan, R., & Sweeney, A. (1996). Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research*, 13, 1–36.

Demski, J. (1998). Performance measure manipulation. *Contemporary Accounting Research*, 15, 261–285.

DuCharme, L., Malatesta, P., & Sefcik, S. (2004). Earnings management, stock issues, and shareholder lawsuits. *Journal of Financial Economics*, 71, 23-49.

Dye, R. (1988). Earnings management in an overlapping generations model. *Journal of Accounting Research*, 26, 195–235.

Fama, E., & French K. (2005). Financing decisions: who issues stock? *Journal of Financial Economics*, 76, 549–582.

Fazzari, S., Hubbard, G., & Petersen, B. (1988). Financing constraints and corporate

investment. *Brookings Papers on Economic Activity*, 141–95.

Frank, Murray Z., & Goyal, V. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics,* 67, 217–248.

Guay, W., Kothari, S., & Watts, R. (1996). A market-based evaluation of discretionary accruals models. *Journal of Accounting Research*, 34, 83–105.

Hadlock, C., & Pierce J. (2010). New evidence on measuring financial constraints: Moving beyond the KZ Index. *Review of Financial Studies*, 23, 1909-1940.

Healy, P., & Wahlen J. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13, 365-383.

Hribar, P., & Collins, D. (2002). Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research*, 40, 105-134.

Jackson, S., Liu, K., & Cecchini, M. (2009) Economic consequences of firms' depreciation method choice: Evidence from capital investments. *Journal of Accounting and Economics,* 48, 54–68.

Kaplan, S., & Zingales L. (1997). Do financing constraints explain why investment is correlated with cash flow? *The Quarterly Journal of Economics,* 112, 169–215.

Kedia, S., & Philippon, T. (2009). The economics of fraudulent accounting. *Review of Financial Studies*, 22, 2169–2199.

Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33, 375–400.

Kothari, S., Leone, A., & Wasley, C. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, 39, 163–197.

Li, K., & Tang, V. (2008). Earnings quarterly and future capital investment: Evidence from discretionary accruals. Working Paper, Georgetown University.

Louis, H., & Robinson, D. (2005). Do managers credibly use accruals to signal private information? Evidence from the pricing of discretionary accruals around stock splits. *Journal of Accounting and Economics*, 39, 361–380.

McNichols, M. (2002). Discussion of the quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77, 61–69.

McNichols, M., & Stubben, S. (2008). Does earnings management affect firms' investment decisions? *The Accounting Review*, 83, 1571–1603.

Pungaliya, R., & Vijh, A. (2009). Do acquiring firms manage earnings? Working Paper, University of Iowa.

Rangan, S. (1998). Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics*, 50, 101–122.

Skinner, D., & Sloan, R. (2002). Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies*, 7, 289–312.

Shivakumar, L. (2000). Do firms mislead investors by overstating earnings before seasoned equity offerings? *Journal of Accounting and Economics*, 19, 339-371.

Stubben, S. (2010). Discretionary revenues as a measure of earnings management. *Accounting Review*, 85, 695-717.

Subramanyam, K. (1996). The pricing of discretionary accruals. *Journal of Accounting and Economics*, 22, 249–281.

Teoh, S., Welch, I., & Wong, T. (1998a). Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics*, 5, 63–99.

Teoh, S., Welch, I., & Wong, T. (1998b). Earnings management and the long-term market performance of initial public offerings. *Journal of Finance*, 53, 1935–1974.

Trueman, B., & Titman, S. (1988). An explanation for accounting income smoothing. *Journal of Accounting Research*, 26, 127-139.

Watts, R., & Zimmerman, J. (1978). Towards a positive theory of the determination of accounting standards. *Accounting Review*, 53, 112–134.

Watts, R., & Zimmerman, J. (1990). Positive accounting theory: A ten year perspective. *Accounting Review*, 65, 131–156.

Appendix: Definitions of Constraint Criteria and the Annual and the Quarterly Variables

Panel A: Construction of Annual Constraint Measures:

Criterion	Definition	Classification
SA Index	$-0.737\times Size + 0.043\times Size^2 - 0.040\times Age$	Top (bottom) 30% firms are constrained (unconstrained).
Net Leverage	Net Debt/(Net Debt + Equity)	Firms with non-positive net debt are unconstrained (39% of firms); The top 50% of firms with positive net debt are constrained (31% of firms).
Free Cash Flows	(Cash Flows – Ave. Past Investment)/Total Debt	Bottom (top) 30% firms are constrained (unconstrained).
Constraint Score	Sum of constraint dummies (one if constrained, and zero otherwise) based on SA Index, net leverage, free cash flows, bond rating, dividend pay-out ratio, and operating cash flows.	Firms with three or more constraints are constrained (31% of sample firms); Firms with one or fewer constraints are unconstrained (39% of sample firms).
Bond Rating	A firm's bond credit rating.	Firms without (with) credit ratings are constrained (unconstrained).
Dividend Pay-out Ratio	Dividends/Net Income	Bottom (top) 30% firms are constrained (unconstrained).
Operating Cash Flows	Operating Cash Flows/Lag(PPE)	Bottom (top) 30% firms are constrained (unconstrained).

Panel B: Definitions of Annual Accounting Variables

Variables	Annual Data Item
Age	Number of years from the first year that a firm has non-missing stock price in Compustat.
Ave. Past Investment	$\text{Average(CAPX)}_{-1 \text{ to } -3}$
Book-to-Market Ratio	(CSHO*PRCC_F)/CEQ
Cash Flows	OANCF
Cash Holdings	CHE/Lag(PPENT)
Credit Rating	SPLTICRM
Dividends	(DVC+DVP)/lagPPENT
Equity	SEQ
Excess Cash	CHE – max(LCT – (ACT– CHE),0)
Market Equity	CSHO*PRCC_F
Net Debt	DLTT + DLC – Excess Cash
Net Income	NI
Operating Cash Flows	IB+DP
Property, Plant, and Equipment	PPENT
Size	AT
Sales Growth	ΔSALE/Lag(SALE)
Tobin's Q	(AT+CSHO*PRCC_F – CEQ-TXDB)/AT
Total Debt	DLTT + DLC

Panel C: Definitions of Quarterly Accounting Variables	
Variable	**Quarterly Data Item**
Accounts Receivable	RECTQ
Investment	CAPXY*/Lag(PPENTQ)
Equity Issuance (cash flow statement)	(SSTKY* – PRSTKCY*)/Lag(ATQ)
Alternative Measure of Equity Issuance (income statement)	(ΔCEQQ – ΔREQ)/Lag(ATQ)
Net Borrowing through Long-term Debt	(DLTISY* – DLTRY*)/Lag(ATQ)
Property, Plant and Equipment	PPENTQ
ROA	IBQ/Lag(ATQ)
Total Accruals	ΔACTQ – ΔCHEQ – ΔLCTQ + ΔDLCQ – DPQ
Total Assets	ATQ
Total Financing (long-term)	Equity Issuance + Net Borrowing through Long-term Debt
Alternative Measure of External Financing (cash flow statement)	– FINCFY*/Lag(ATQ)

*Denotes the quarterly variables that are year-to-date. Before inserting these variables into the formula, we first convert them into quarterly values. Specifically, for the second to the fourth quarters, we subtract the lag values from the year-to-date values.

Figure 1
Quarterly Timeline

The figure illustrates the timing of the key measures we use in the paper. We measure investment opportunities and financial constraints as of the year-end prior to two-quarters before the investment quarter *q*, discretionary accruals in the two quarters preceding the investment quarter, and financing in the quarter of, and quarter before, the investment quarter.

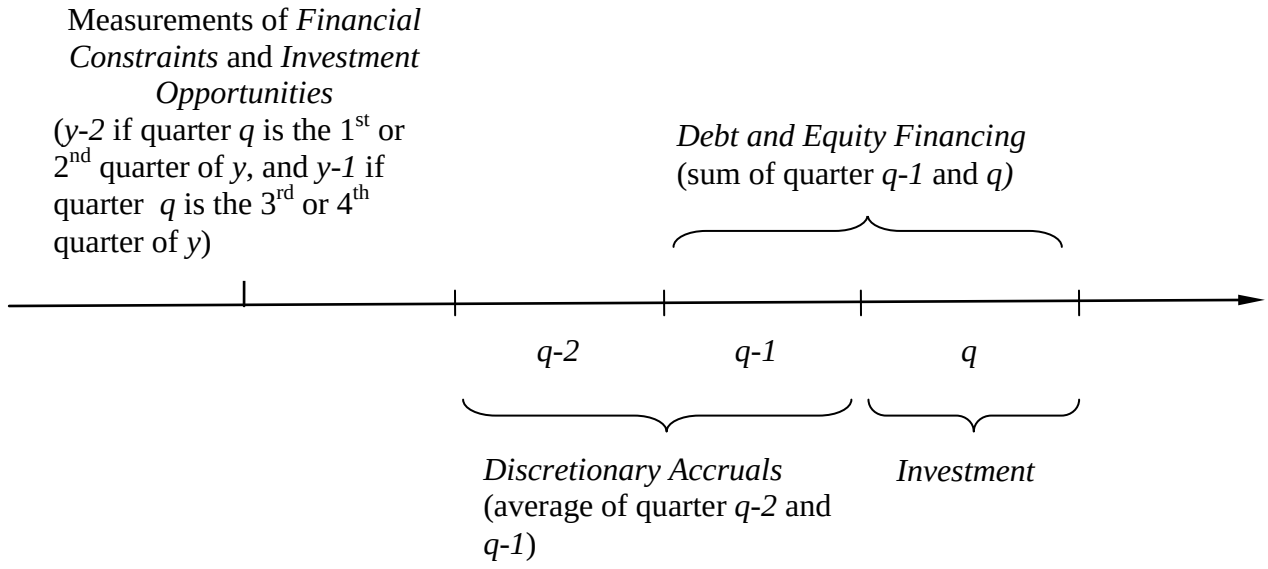

Table 1
Summary Statistics and Correlations

Panel A presents means, standard deviations, and 10, 25, 50, 75, and 90 percent cutoff points for asset size, quarterly investment, abnormal accruals, ROA, book leverage, Tobin's Q, cash holdings, cash flows, and sales growth for sample firms. Our sample contains 240,940 firm-quarters from 1989-2009. Investment is quarterly capital expenditure scaled by property, plant, and equipment. Quarterly abnormal accruals are estimated using modified-Jones model with performance adjustment. ROA is quarterly income before extraordinary items scaled by total assets. Book leverage is total debt divided by the summation of debt and book equity. Tobin's Q is the summation of market equity and total debt divided by summation of book equity and total debt. Cash holdings is cash and equivalent scaled by property, plant and equipments. Sales growth is change in annual sales scaled by lag sales. Panel B further presents correlation coefficients between the our main binary measures of financial constraints constructed based on SA Index, net leverage, free cash flows, and constraint score. We also report correlations among binary measures of financial constraints based on credit rating, dividend pay-out ratio, and operating cash flows, which are used together with SA Index, net leverage, and free cash flows to construct the constraint score measure. The details of the constraint measures and the quarterly and annual variables are described in the Appendix. Since all the correlations in Panel B are significant at the 0.01 levels, we do not report p-values for brevity.

Panel A: Summary Statistics

	Mean	Std	P10	P25	P50	P75	P90
Asset Size ($Million)	1411.94	4535.54	11.21	35.09	145.35	693.80	2743.81
Investment	0.07	0.10	0.01	0.02	0.05	0.09	0.16
Abnormal Accruals (%)	-0.04	5.41	-5.52	-2.28	0.01	2.27	5.45
ROA	-0.01	0.07	-0.07	-0.01	0.01	0.02	0.04
Book Leverage	0.31	0.31	0.00	0.04	0.26	0.48	0.68
Tobin's Q	2.08	1.87	0.87	1.07	1.45	2.28	3.88
Cash Holdings	3.56	11.14	0.02	0.08	0.39	2.01	8.05
Cash Flows	-0.50	5.72	-1.98	0.02	0.28	0.68	1.60
Sales Growth	0.22	0.66	-0.16	-0.01	0.10	0.26	0.59

Panel B: Correlations of Constraint Measures

	SA Index	Net Leverage	Free Cash Flows	Constraint Score	Credit Rating	Pay-out Ratio
Net Leverage	-0.367					
Free Cash Flows	0.423	0.358				
Constraint Score	0.821	0.268	0.772			
Credit Rating	0.456	-0.017	0.171	0.732		
Dividend Pay-out Ratio	0.520	-0.270	0.129	0.594	0.229	
Operating Cash Flows	0.383	0.272	0.723	0.622	0.138	-0.165

Table 2

Abnormal Accruals (%) of Firms Sorted on Investment Opportunities and Financial Constraints

For each quarter *q*, we sort firms simultaneously into quintiles of investment opportunities and two groups of financial constraints. Investment opportunity is the predicted value of the cross-sectional regression of investment of quarter *q* in equation (2). Financial constraint criteria are SA Index (Panel A), net leverage (Panel B), free cash flows (Panel C), and constraint score (Panel D), respectively. Financial constraint is the annual measure of year *y*-2 (*y*-1) if quarter *q* is the first or second (third or fourth) quarter of *y*. The timeline of the variables is plotted in Figure 1, and the details of the variables are described in the Appendix. For each two-dimensional group, we present average quarterly accruals of quarters *q*-2 and *q*-1, where quarterly abnormal accruals are performance-adjusted discretionary accruals estimated with modified-Jones model. We first calculate cross-sectional average accruals of quarters *q*-2 and *q*-1 for each two-dimensional groups and then present time-series means. We also report time-series averages of the numbers of firms in the two dimensional portfolios. *T*-statistics for the differences are calculated with Newey-West robust standard errors with five lags and are reported in parentheses.

	Quintiles of Investment Opportunities						
	Low	2	3	4	High	High-Low	t-stat
Panel A: Constraint Criterion: SA Index							
Unconstrained Firms	-0.10	-0.15	-0.19	-0.10	-0.05	0.05	(1.08)
Constrained Firms	0.08	0.02	0.13	0.27	0.58	0.49	(4.38)
Constrained - Unconstrained	0.18	0.16	0.32	0.37	0.63	0.45	
t-stat	(2.43)	(3.55)	(5.52)	(6.07)	(5.61)	(3.45)	
#Unconstrained Firms	249	209	181	149	79		
#Constrained Firms	67	108	136	167	237		
Panel B: Constraint Criterion: Net Leverage							
Unconstrained Firms	-0.06	-0.01	-0.02	0.08	0.30	0.37	(3.44)
Constrained Firms	-0.04	-0.07	0.05	0.12	0.87	0.91	(4.94)
Constrained - Unconstrained	0.03	-0.06	0.07	0.04	0.57	0.54	
t-stat	(0.29)	(-0.78)	(1.14)	(0.34)	(3.45)	(2.50)	
#Unconstrained Firms	39	138	233	291	337		
#Constrained Firms	324	226	131	73	26		
Panel C: Constraint Criterion: Free Cash Flows							
Unconstrained Firms	0.01	-0.07	-0.07	0.02	0.03	0.02	(0.30)
Constrained Firms	-0.16	-0.07	-0.03	0.10	0.48	0.64	(6.66)
Constrained - Unconstrained	-0.16	0.00	0.04	0.08	0.46	0.62	
t-stat	(-2.03)	(0.06)	(0.63)	(1.06)	(6.32)	(5.91)	
#Unconstrained Firms	96	122	128	135	128		
#Constrained Firms	135	109	103	96	103		
Panel D: Constraint Criterion: Constraint Score							
Unconstrained Firms	-0.09	-0.15	-0.16	-0.12	0.03	0.12	(2.64)
Constrained Firms	-0.04	-0.05	0.05	0.20	0.55	0.59	(5.16)
Constrained - Unconstrained	0.05	0.10	0.21	0.31	0.53	0.48	
t-stat	(0.92)	(2.72)	(4.80)	(9.62)	(6.54)	(3.97)	
#Unconstrained Firms	216	214	215	217	204		
#Constrained Firms	163	165	165	163	175		

Table 3
Panel Regressions of Abnormal Accruals on Investment Opportunities and Financial Constraints

This table presents panel regressions of abnormal accruals on investment opportunities and constraint measures. The dependent variable is average abnormal accrual of quarters *q*-1 and *q-2*, where quarterly abnormal accruals are performance-adjusted discretionary accrual measures estimated with modified-Jones model. The independent variables include investment opportunities, constraint measure, interaction between investment opportunities and constraint measure, book-to-market ratio, market equity, and sales growth. Investment opportunity is the predicted value of the cross-sectional regression of investment of *q* in equation (2). Financial constraint is a binary variable constructed based on SA Index, net leverage, free cash flows, and constraint score, respectively. Financial constraint and investment opportunities are measured at the end of fiscal year *y*-2 (*y*-1) if quarter *q* is the 1st or 2nd (3rd or 4th) quarter of *y*. All the other control variables are annual and are measured at the same time as financial constraint. Details of the variables are described in the Appendix. We standardize all the independent variables except financial constraint in each cross-section. We estimate regressions with year-quarter fixed effects. Robust *t*-statistics with clustered standard errors within year-quarter are reported in the parentheses. The regressions are estimated with intercepts which are not reported for brevity.

	Constraint Criteria							
	SA Index		**Net Leverage**		**Free Cash Flows**		**Constraint Score**	
Investment Opp.*Constraint	0.176	0.179	0.055	0.057	0.184	0.184	0.187	0.188
t-stat	(7.24)	(7.42)	(1.71)	(1.77)	(4.94)	(4.94)	(8.05)	(8.02)
Investment Opportunities	0.015	0.013	0.139	0.138	0.043	0.043	0.049	0.049
t-stat	(1.01)	(0.89)	(8.96)	(8.88)	(1.78)	(1.77)	(3.86)	(3.83)
Constraint	0.268	0.270	0.126	0.123	0.036	0.034	0.201	0.200
t-stat	(10.11)	(10.15)	(4.08)	(3.95)	(1.62)	(1.54)	(12.28)	(12.23)
Book-to-Market Ratio	0.019	0.019	0.027	0.027	0.021	0.021	0.023	0.023
t-stat	(1.27)	(1.27)	(2.28)	(2.29)	(1.17)	(1.20)	(1.62)	(1.62)
Market Equity	-0.051	-0.051	-0.089	-0.089	-0.099	-0.099	-0.052	-0.052
t-stat	(-9.34)	(-9.48)	(-13.36)	(-13.31)	(-12.60)	(-12.68)	(-9.46)	(-9.47)
Sales Growth	0.044	0.044	0.036	0.036	0.040	0.040	0.043	0.043
t-stat	(3.16)	(3.17)	(2.93)	(2.91)	(2.15)	(2.18)	(3.17)	(3.18)
Year-Quarter Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Adj. R-sq	0.005	0.006	0.003	0.003	0.003	0.004	0.004	0.004
# Observations	132,995	132,994	152,743	152,743	92,405	92,405	159,289	159,289

Table 4

Announcement Returns of Firms Sorted on Abnormal Accruals and Financial Constraints

For each quarter *q*, we sort firms simultaneously into quintiles of average abnormal accruals of quarters *q*-1 and *q*-2, and two groups of financial constraint. Quarterly abnormal accruals are performance-adjusted discretionary accrual measures estimated with modified-Jones model. Financial constraint criteria are SA Index, net leverage, free cash flows, and constraint score, respectively. Financial constraint for quarter *q* is the annual measure of year *y*-2 (*y*-1) if quarter *q* is the 1st or 2nd (3rd or 4th) quarter of *y*. Details of the variables are described in the Appendix. We calculate four day abnormal buy-and-hold returns (excess of CRSP value-weighted index returns) in the [-2,1] windows surrounding earnings announcements of quarters *q*-1 and *q*-2, respectively. We then calculate cross-sectional average announcement returns for each two-dimensional group, and present time-series means. Panel A presents results on quarter *q*-1 earnings announcement returns and Panel B for quarter *q*-2 announcement returns. *T*-statistics are calculated with Newey-West robust standard errors with five lags.

	Quintiles of Abnormal Accruals						
	Low	2	3	4	High	High-Low	t-stat
Panel A: Four-Day Abnormal Returns (%) surrounding Announcements of quarter q-1							
Constraint Criterion: SA Index							
Unconstrained Firms	0.56	0.55	0.59	0.65	0.79	0.23	(2.19)
Constrained Firms	0.16	0.66	1.02	1.11	1.79	1.62	(8.05)
Constrained - Unconstrained						1.39	(6.30)
Constraint Criterion: Net Leverage							
Unconstrained Firms	0.35	0.38	0.49	0.65	1.00	0.65	(5.00)
Constrained Firms	0.66	0.78	0.92	1.14	1.93	1.27	(6.10)
Constrained - Unconstrained						0.62	(2.49)
Constraint Criterion: Free Cash Flows							
Unconstrained Firms	0.68	0.81	0.83	0.84	1.20	0.52	(3.29)
Constrained Firms	0.10	0.25	0.59	0.85	1.51	1.41	(5.27)
Constrained - Unconstrained						0.89	(3.01)
Constraint Criterion: Constraint Score							
Unconstrained Firms	0.56	0.56	0.57	0.75	0.66	0.10	(0.89)
Constrained Firms	0.37	0.68	0.93	1.08	1.75	1.38	(6.72)
Constrained - Unconstrained						1.28	(5.24)
Panel B: Four-Day Abnormal Returns(%) surrounding Announcements of quarter q-2							
Constraint Criterion: SA Index							
Unconstrained Firms	0.41	0.46	0.69	0.70	0.85	0.45	(3.25)
Constrained Firms	-0.16	1.00	0.92	1.10	2.06	2.22	(11.11)
Constrained - Unconstrained						1.77	(7.27)
Constraint Criterion: Net Leverage							
Unconstrained Firms	-0.17	0.43	0.45	0.76	1.28	1.45	(11.13)
Constrained Firms	0.44	0.93	1.11	1.20	2.12	1.68	(8.82)
Constrained - Unconstrained						0.23	(1.12)
Constraint Criterion: Free Cash Flows							
Unconstrained Firms	0.58	0.65	0.85	1.00	1.38	0.80	(4.43)
Constrained Firms	-0.44	0.48	0.82	0.83	1.99	2.43	(11.58)
Constrained - Unconstrained						1.63	(5.81)
Constraint Criterion: Constraint Score							
Unconstrained Firms	0.28	0.50	0.63	0.73	1.01	0.73	(6.70)
Constrained Firms	-0.10	0.99	1.08	1.14	2.07	2.18	(11.28)
Constrained - Unconstrained						1.45	(7.11)

Table 5

External Financing across Groups of Abnormal Accruals: Financially Constrained Firms

This table presents external financing for constrained firms across levels of abnormal accruals. For each quarter *q*, we simultaneously sort firms into quintiles of average abnormal accruals of quarter *q-1* and *q-2* and two groups of financial constraint. Quarterly abnormal accruals are performance-adjusted discretionary accrual measures estimated with modified-Jones model. Financial constraint criteria are SA Index, net leverage, free cash flows, and constraint score, respectively. Financial constraint is the annual measure of year *y*-2 (*y*-1) if quarter *q* is the 1st or 2nd (3rd or 4th) quarter of *y*. We then calculate equity issuance and borrowing in the quarters *q*-1 and *q* for the financially constrained firms. The quarterly equity issuance measure is the sales of common and preferred equity minus the purchase of common and preferred equity (both from the statement of cash flows), scaled by total assets at the beginning of the quarter. The quarterly net borrowing through long-term debts is calculated as issuance of long-term debt minus reduction of long-term debt (both from the statement of cash flows), scaled by total assets at the beginning of the quarter. Total external financing is the summation of equity issuance and net borrowing through long-term debts when both are available. Details of the variables are described in the Appendix. We first calculate cross-sectional average issuance or borrowing for each quintile, and then present time-series means. *T*-statistics calculated with Newey-West robust standard errors with five lags are reported in parentheses.

	Quintiles of Abnormal Accruals						
	Low	2	3	4	High	H-L	t-stat
Total External Financing: Long-Term (%)							
Constraint Criterion: SA Index	4.10	3.14	2.81	3.26	5.32	1.22	(4.37)
Constraint Criterion: Net Leverage	1.54	0.72	0.96	1.54	3.49	1.95	(7.71)
Constraint Criterion: Free Cash Flows	3.42	2.48	2.45	3.01	5.08	1.66	(6.05)
Constraint Criterion: Constraint Score	3.26	2.33	2.13	2.79	4.89	1.63	(6.62)
Equity Issuance (%)							
Constraint Criterion: SA Index	3.64	2.86	2.57	2.91	4.46	0.82	(3.35)
Constraint Criterion: Net Leverage	1.46	0.72	0.73	0.97	2.46	1.01	(4.11)
Constraint Criterion: Free Cash Flows	2.92	2.14	2.01	2.53	3.98	1.06	(4.80)
Constraint Criterion: Constraint Score	2.88	2.16	1.99	2.36	3.89	1.01	(4.34)
Net Borrowing through Long-term Debts (%)							
Constraint Criterion: SA Index	0.54	0.34	0.38	0.45	0.88	0.34	(4.60)
Constraint Criterion: Net Leverage	0.25	0.16	0.43	0.83	1.31	1.06	(6.82)
Constraint Criterion: Free Cash Flows	0.53	0.37	0.50	0.63	1.12	0.59	(5.42)
Constraint Criterion: Constraint Score	0.42	0.20	0.21	0.52	1.03	0.61	(5.62)

Table 6: Panel Regressions of External Financing: Financially Constrained Firms

This table presents panel regressions of external financing on accruals for financially constrained firms. Financial constraint is a binary variable constructed based on SA Index, net leverage, free cash flows, or constraint score. In Panel A, the dependent variable is total long-term external financing of quarters *q*-1 and *q*. Total long-term external financing of a quarter is the sum of equity issuance and net borrowing through long-term debt. Quarterly equity issuance is the sales of common and preferred equity minus the purchase of common and preferred equity (both from the statement of cash flows), scaled by total assets at the beginning of the quarter. Quarterly net borrowing through long-term debt is issuance of long-term debt minus reduction of long-term debt (both from the statement of cash flows), scaled by total assets at the beginning of the quarter. The independent variables include abnormal accruals, cash flows, Tobin's Q, book leverage, dividend, cash holdings, and sales growth. Abnormal accrual is the average abnormal accruals of quarters *q*-2 and *q*-1, where quarterly abnormal accruals are performance-adjusted discretionary accrual measures estimated with modified-Jones model. All other independent variables are annual and are measured at the same time as financial constraint. Panel B is similar to Panel A but the dependent variable is equity issuance. Panel C is similar to Panel A but the independent variable is net borrowing through long-term debt. All the issuance and borrowing measures are industry-adjusted by the medians of the firm's two-digit SIC industry. We standardize all the independent variables in each cross-section. We estimate regressions with year-quarter fix effects. Robust *t*-statistics with clustered standard errors within year-quarter are reported in parentheses. The regressions are estimated with intercepts which are not reported for brevity.

	Constraint Criteria			
	SA Index	Net Leverage	Free Cash Flows	Constraint Score
	Panel A: Total External Financing: Long-Term			
Abnormal Accruals	0.003	0.006	0.004	0.004
t-stat	(5.03)	(9.43)	(5.83)	(7.81)
Cash Flow	-0.011	-0.012	-0.011	-0.011
t-stat	(-13.60)	(-10.47)	(-11.98)	(-11.66)
Q	0.016	0.021	0.023	0.020
t-stat	(14.10)	(12.60)	(16.35)	(17.53)
Leverage	0.004	-0.003	0.000	-0.001
t-stat	(6.01)	(-3.93)	(0.23)	(-2.25)
Dividend	0.002	0.001	0.004	0.005
t-stat	(3.48)	(0.86)	(4.71)	(5.42)
Cash Holdings	-0.005	-0.006	-0.007	-0.005
t-stat	(-7.19)	(-3.10)	(-5.45)	(-5.30)
Sales Growth	0.003	0.008	0.003	0.004
t-stat	(5.02)	(10.37)	(3.78)	(5.53)
Year-Quarter Fixed Effects	Yes	Yes	Yes	Yes
Adj. R-sq	0.114	0.070	0.110	0.091
# Observations	44,550	49,415	31,402	50,823
	Panel B: Equity Issuance			
Abnormal Accruals	0.002	0.003	0.002	0.002
t-stat	(3.85)	(5.27)	(2.92)	(4.68)
Cash Flow	-0.010	-0.010	-0.010	-0.010
t-stat	(-14.08)	(-13.67)	(-12.48)	(-12.04)
Q	0.015	0.015	0.020	0.017
t-stat	(12.56)	(9.10)	(14.74)	(14.62)

Table 6 cont'd

	Constraint Criteria			
	SA Index	Net Leverage	Free Cash Flows	Constraint Score
	Panel B: Equity Issuance			
Leverage	0.003	-0.000	-0.000	-0.001
t-stat	(5.77)	(-0.53)	(-0.34)	(-1.98)
Dividend	0.002	0.001	0.003	0.004
t-stat	(3.42)	(0.87)	(3.79)	(5.31)
Cash Holdings	-0.003	-0.001	-0.004	-0.002
t-stat	(-5.30)	(-0.59)	(-3.70)	(-2.69)
Sales Growth	0.001	0.003	0.001	0.002
t-stat	(2.21)	(5.70)	(1.03)	(2.73)
Year-Quarter Fixed Effects	Yes	Yes	Yes	Yes
Adj. R-sq	0.096	0.070	0.107	0.093
# Observations	49,347	57,960	35,892	58,425
	Panel C: Net Borrowing through Long-term Debts			
Abnormal Accruals	0.001	0.003	0.002	0.002
t-stat	(4.80)	(9.39)	(5.36)	(7.94)
Cash Flow	-0.001	-0.001	-0.001	-0.001
t-stat	(-3.63)	(-0.75)	(-2.20)	(-3.68)
Q	0.001	0.005	0.002	0.002
t-stat	(3.44)	(6.77)	(4.75)	(6.10)
Leverage	0.001	-0.002	0.001	-0.000
t-stat	(2.13)	(-4.87)	(1.23)	(-0.74)
Dividend	0.001	0.001	0.001	0.001
t-stat	(3.49)	(1.98)	(3.49)	(3.65)
Cash Holdings	-0.002	-0.006	-0.002	-0.003
t-stat	(-8.15)	(-4.69)	(-6.13)	(-9.42)
Sales Growth	0.001	0.006	0.002	0.002
t-stat	(6.69)	(9.73)	(5.95)	(7.83)
Year-Quarter Fixed Effects	Yes	Yes	Yes	Yes
Adj. R-sq	0.012	0.030	0.015	0.017
# Observations	53,988	55,102	37,899	60,212

Table 7

Investment across Groups of Abnormal Accruals: Constrained and Unconstrained Firms

For each quarter *q*, we simultaneously sort firms into quintiles of average abnormal accruals of quarter *q-1* and *q*-2 and two groups of financial constraints. Quarterly abnormal accruals are performance-adjusted discretionary accrual measures estimated with modified-Jones model. Financial constraint criteria are SA Index, net leverage, free cash flows, and constraint score, respectively. Financial constraint for quarter *q* is the annual measure of year *y*-2 (*y*-1) if quarter *q* is the 1st or 2nd (3rd or 4th) quarter of *y*. We then report average investment of quarter *q*. Panel A reports raw quarterly investment calculated as capital expenditure scaled by property, plant, and equipment. Panel B reports abnormal investment calculated as residuals from quarterly regressions of raw investment on firm characteristics in equation (2). We first calculate cross-sectional average investment for each quintile in quarter *q*, and then present time-series means. Details of the variables are described in the Appendix. *T*-statistics are calculated with Newey-West robust standard errors with five lags and are reported in parentheses.

	Quintiles of Abnormal Accruals						
	Low	2	3	4	High	H-L	t-stat
Panel A: Raw Investment							
Constrained Firms							
Constraint Criterion: SA Index	0.087	0.089	0.088	0.091	0.104	0.016	(5.44)
Constraint Criterion: Net Leverage	0.057	0.050	0.047	0.049	0.065	0.008	(3.99)
Constraint Criterion: Free Cash Flows	0.069	0.066	0.064	0.068	0.085	0.016	(5.82)
Constraint Criterion: Constraint Score	0.072	0.069	0.066	0.070	0.088	0.016	(6.45)
Unconstrained Firms							
Constraint Criterion: SA Index	0.057	0.054	0.052	0.053	0.062	0.005	(4.10)
Constraint Criterion: Net Leverage	0.094	0.091	0.092	0.096	0.109	0.015	(5.21)
Constraint Criterion: Free Cash Flows	0.076	0.070	0.069	0.074	0.085	0.009	(6.52)
Constraint Criterion: Constraint Score	0.073	0.065	0.063	0.067	0.081	0.007	(5.19)
Panel B: Abnormal Investment							
Constrained Firms							
Constraint Criterion: SA Index	0.0031	0.0039	0.0025	0.0033	0.0143	0.0112	(4.58)
Constraint Criterion: Net Leverage	0.0006	-0.0022	-0.0047	-0.0040	0.0061	0.0055	(3.00)
Constraint Criterion: Free Cash Flows	-0.0025	-0.0035	-0.0043	-0.0032	0.0094	0.0119	(4.63)
Constraint Criterion: Constraint Score	-0.0005	-0.0018	-0.0034	-0.0022	0.0112	0.0117	(5.69)
Unconstrained Firms							
Constraint Criterion: SA Index	-0.0063	-0.0071	-0.0076	-0.0079	-0.0021	0.0042	(3.54)
Constraint Criterion: Net Leverage	0.0011	-0.0001	0.0002	0.0012	0.0110	0.0099	(4.12)
Constraint Criterion: Free Cash Flows	0.0002	-0.0039	-0.0042	-0.0016	0.0080	0.0078	(5.90)
Constraint Criterion: Constraint Score	-0.0017	-0.0041	-0.0056	-0.0047	0.0026	0.0042	(3.71)

Table 8

Abnormal Quarterly ROA of Constrained Firms that Manage Earnings and Invest

Panel A presents average quarterly abnormal ROA of firms that manage earnings to ease financial constraints and invest. For each quarter *q*, we sort firms simultaneously into quintiles of investment in quarter *q*, quintiles of average abnormal accruals of quarter *q*-1 and *q*-2, and two groups of financial constraint. Quarterly abnormal accruals are performance-adjusted discretionary accrual measures estimated with modified-Jones model. Financial constraint criteria are SA Index, net leverage, free cash flows, and constraint score, respectively. Financial constraint for quarter *q* is the annual measure of year *y*-2 (*y*-1) if quarter *q* is the 1st or 2nd (3rd or 4th) quarter of *y*. Details of the variables are described in the Appendix. We then examine constrained firms that are in the top quintile of investment and top quintile of accruals as event firms. For each event firm we choose a constrained non-investment (firms in the bottom four quintiles of investment) matching firm with the same two-digit SIC code and with the closest ROA in year -1 compared to the event firm. We then report the averages of annual abnormal ROA (difference between event firm and matching firm) and associated t-statistics in the six-year window around quarter *q* for the event firms. To control for the effects of earnings management on ROA, year -1 includes the four quarters from the quarter *q*-8 to the quarter *q*-5, and year 1 includes the four quarters from the quarter *q*+5 to the quarter *q*+8. Annual abnormal ROA for a year is the average ROA of the four quarters during the year. We also report the change in average ROA between the three years prior to investment and the three years after investment. Panel B is similar to Panel A except that both event firms and matching firms are taken from the unconstrained sample. Panel C reports the difference in change in ROA between constrained and unconstrained firms with the associated *t*-statistics.

	Constraint Criteria			
	SA Index	**Net Leverage**	**Free Cash Flows**	**Constraint Score**
Panel A: ROA of Constrained Firms that Manage Earnings Prior to Investments (%)				
ROA of Year -3	-2.01	-2.90	-2.26	-2.13
t-stat	(-9.63)	(-8.60)	(-8.33)	(-10.57)
ROA of Year -2	-1.00	-2.84	-2.23	-1.59
t-stat	(-5.24)	(-9.06)	(-8.91)	(-8.76)
ROA of Year -1	-0.77	-1.92	-1.23	-0.79
t-stat	(-7.20)	(-8.21)	(-8.72)	(-7.82)
ROA of Year 1	0.33	-0.78	-0.28	-0.08
t-stat	(1.57)	(-2.84)	(-1.12)	(-0.42)
ROA of Year 2	-0.26	-1.24	-0.53	-0.41
t-stat	(-1.27)	(-4.33)	(-2.03)	(-2.14)
ROA of Year 3	-0.16	-1.72	-0.49	-0.40
t-stat	(-0.74)	(-6.20)	(-1.77)	(-1.99)
Ave(1,2,3) - Ave(-1, -2, -3): (1)	1.23	1.31	1.47	1.21
t-stat	(6.00)	(4.29)	(5.80)	(6.47)
Panel B: ROA of Unconstrained Firms that Manage Earnings Prior to Investments (%)				
ROA of Year -3	0.07	-1.83	-1.29	-0.54
t-stat	(0.80)	(-11.89)	(-8.90)	(-5.23)
ROA of Year -2	0.08	-1.49	-0.51	-0.42
t-stat	(0.89)	(-10.93)	(-4.63)	(-4.74)
ROA of Year -1	0.13	-0.61	0.04	0.02
t-stat	(2.54)	(-8.47)	(0.81)	(0.50)
ROA of Year 1	-0.13	-0.40	-0.57	-0.33
t-stat	(-1.48)	(-2.64)	(-4.66)	(-3.13)
ROA of Year 2	-0.35	-0.58	-0.73	-0.45
t-stat	(-3.82)	(-3.93)	(-5.52)	(-4.47)

Table 8 cont'd

	Constraint Criteria			
	SA Index	**Net Leverage**	**Free Cash Flows**	**Constraint Score**
ROA of Year 3	-0.20	-0.32	-0.76	-0.49
t-stat	(-2.05)	(-2.05)	(-5.76)	(-4.50)
Ave(1,2,3) - Ave(-1, -2, -3): (2)	-0.32	0.88	-0.11	-0.11
t-stat	(-3.64)	(6.18)	(-0.89)	(-1.16)
Panel C: Differences of Differences Between Constrained and Unconstrained Firms				
(1)-(2)	1.55	0.43	1.58	1.32
t-stat	(6.95)	(1.28)	(5.63)	(6.29)