# Accounting Conservatism, Financial Constraints, and Corporate Investment


## Abstract:

This paper documents negative associations between conservatism and both firm investments and future operating performance for financially constrained firms. The negative correlations are consistent with accounting literature's predictions that accounting conservatism can cause dysfunctional investment incentives for managers and motivate them to forego positive NPV projects (Leuz, 2001; Watts, 2003a; Guay and Verrecchia, 2006). Further, consistent with literature, empirical evidence show that the negative correlation between conservatism and firm investments is more pronounced for firms with high return volatility and for firms with short CEO tenure horizon. Last, the negative correlation between conservatism and future investments is mitigated by CEOs' equity ownership, suggesting that equity ownership mitigates agency conflicts (Jensen and Meckling, 1976). The results are robust to alternative empirical strategy, variable specifications, and sample selection criteria.



*JEL Classification:* G31; M41

*Keywords:* Accounting conservatism, Underinvestment, Investment efficiency**.**

## 1. Introduction

This paper examines the effects of accounting conservatism on managers' investment incentives. The predicted relationship between these two factors based on accounting literature is mixed. One strand of accounting literature argues that timely loss recognition, one important component of accounting conservatism, can discipline managers and reduce agency costs related to overinvestment (Ball, 2001; Ball and Shivakumar, 2005). The other strand of literature suggests that untimely gain recognition distorts managers' investment incentives and induce them to forego positive net present value (NPV) projects resulting in underinvestment (Leuz, 2001; Watts, 2003a; Guay and Vierrecchia, 2006; Roychowdhury, 2010). Despite the debate, empirical studies examining the role of conservatism on firm investment are limited and only focus on how conservatism constrains overinvestment tendency (Francis and Martin, 2010; Bushman et al., 2007). No studies so far investigate whether conservatism can also cause dysfunctional investment incentives. This study fills this gap and makes initial efforts to examine whether accounting conservatism can distort managers' investment incentives.[1] [2]

One empirical challenge to distinguish the two competing but non-exclusive hypotheses is that both theories predict a negative (positive) correlation between timely loss (gain) recognition and firm investments. It is difficult to infer whether timely loss (gain) recognition constrain (induce) overinvestment (underinvestment) or cause underinvestment (overinvestment). To overcome this problem, I examine the relationship between investment and the timeliness of accounting recognition for financially constrained and unconstrained firms. In

[1] The term accounting conservatism is used to refer to three components of accounting conservatism: asymmetric timeliness of earnings, timely loss recognition, and untimely gain recognition. In the empirical tests, I examine the relationship between firm investment and these three components of accounting conservatism jointly.

[2] Consistent with Ball (2001), Ball and Shivakumar (2005), LaFond and Watts (2008), and Francis and Martin (2010), I assume in this paper that accounting conservatism is exogenously imposed on managers either as part of corporate governance mechanism or by external forces.

particular, I focus on financially constrained firms and examine how the timeliness of gain and loss recognition affects managers' investment incentives. The empirical strategy builds on the findings from extent finance literature that financially constrained firms are more likely to forego positive NPV projects due to limited access to external capitals (Almeida, Campello, and Weisbach, 2004; Faulkender and Wang, 2006; Denis and Sibikov, 2010). Hence, ex ante, financially constrained firms are more (least) likely to suffer underinvestment (overinvestment). In this case, a negative (positive) correlation between timely loss (gain) recognition and investment would suggest that timely loss (gain) recognition can cause (mitigate) underinvestment for financially constrained firms. In contrast, because financially unconstrained firms can suffer both under and overinvestment simultaneously, a negative (positive) relationship between timely loss (gain) recognition is consistent with both constraining (inducing) overinvestment and inducing (mitigating) underinvestment. Further tests as discussed in next paragraph are used to disentangle these two competitive hypotheses.[3]

To further shed light on the effect of conservatism on firm investments, I also examine the relationship between conservatism and ex post firm accounting performance conditional on firm financial constraints. Although the under and overinvestment hypotheses both predict a negative (positive) correlation between firm investments and timely loss (gain) recognition, the two hypotheses yield different predictions regarding the relationship between timeliness of loss (gain) recognition and firm future operating performance. Examining the relationship between recognition timeliness and future operating performance can help further distinguish the two competing hypotheses. Specifically, if TLR (TGR) can cause a firm to under invest, then the firm's future performance will deteriorate. A negative correlation between TLR and future

[3] The under and overinvestment hypotheses are not mutually exclusively and can exist at the same time. The empirical tests only document the dominant forces for financially constrained and unconstrained firms.

performance is expected. On the other hand, if TLR can constrain overinvestment, then we should expect a positive correlation between accounting conservatism and future operating performance because firms are less likely to invest in value-destroying projects. Likewise, if TGR can cause (mitigate) financially constrained firms to under invest, then we should observe a negative (positive) correlation between conservatism and firm future performance. Likewise, if conservatism can reduce (cause) overinvestment problem for financially unconstrained firms, then a positive (negative) correlation between conservatism and future performance is expected.

I use Basu's (1997) conditional conservatism as the measure of accounting conservatism because the hypotheses are based on the asymmetric verification standards imposed for recognizing bad news versus good news. Following the literature (Richardson, 2006; Denis and Sibikov, 2010), firm investment is measured as firm capital expenditures net of depreciation expenses obtained from cash flow statements.[4] To reduce the concerns of omitted correlated variable problems, I model firm investment as a function of a vector of explanatory factors that shown by literature can affect firm investment behavior. Then I examine whether accounting conservatism is correlated with the component of investments that cannot be explained by those factors in the predicted way. In the robustness section, I also use total investments and changes in firm capital expenditures as alternative measures of investments and examine the relationship between conservatism and these two alternative investment measures conditional on firm financial constraints.

Empirical results show that accounting conservatism is negatively correlated with both investments and future operating performance for financially constrained firms, providing consistent results supporting the underinvestment hypothesis. In contrast, for financially

[4] The results are qualitatively same if I use total capital expenditure instead of net capital expenditures. Please see additional discussions in the robustness test section.

unconstrained firms, accounting conservatism is negatively correlated with firm investments and positively correlated with future operating performance, suggesting that financially unconstrained firms are more likely to suffer overinvestment and accounting conservatism can constrain managers' incentive to invest in negative NPV projects. Combined together, the results are consistent with both under and overinvestment arguments as predicted by accounting literature. After documenting the negative correlation between conservatism and firm investment for financially constrained firms, I also examine cross sectional variations in the negative correlation based on the literature's predictions. Consistent with the literature, I find that for financially constrained firms the negative correlation between conservatism and investments is more pronounced for firms with high stock return volatility and for firms with short-term oriented CEOs. Hence, the documented cross sectional variations lend further support to the underinvestment hypothesis. Lastly, the empirical results also show that the underinvestment problem is mitigated by CEO equity ownership, indicating that equity ownership can reduce agency conflicts related to firm investment policy (Jensen and Meckling, 1976).

Firm investment and accounting policy are likely to be determined by unobservable firm characteristics. Although several steps are taken in the empirical design to address the potential endogeneity problems, to further alleviate any residual concern, I explore the regulation of the Sarbanes and Oxley Act (SOX) of year 2002 and investigate the underinvestment hypothesis by identifying an exogenous shock to firm accounting conservatism. The passage of SOX increases managers' and auditors' legal liability, and they have responded by increasing the conservatism of financial reporting (Lobo and Zhou, 2006; Iliev 2010). Consistent with the underinvestment hypothesis, I find that firm investments decrease significantly in the post SOX period after controlling for investment opportunities and the decrease is larger for financially constrained

firms. Further, the results show that the negative correlation between accounting conservatism and investment becomes stronger in the post SOX period and this enhanced negative correlation is mostly attributable to financially constrained firms.

This paper contributes to the literature examining the economic impacts of accounting conservatism.[5] Extant studies argue that accounting conservatism can mitigate agency conflicts between lenders and borrowers (Watts, 2001; LaFond and Watts, 2008; LaFond and Roychowdhury, 2008). Based on this argument, studies show that accounting conservatism can reduce cost of capital (Ahmed et al., 2002; Moerman, 2008; Zhang, 2008; Garcia Lara et al, 2009). However, none of the studies investigate whether the reduced costs of capital will translate into increased capital investments, especially for financially constrained firms.[6] Given that accounting literature also argues that accounting conservatism can distort managers' investment incentives, it is possible that managers may decide not to take advantage of the reduced cost of capital and forego positive NPV projects. The contribution of this paper is to show early evidence that accounting conservatism can cause dysfunctional incentives and induce underinvestment.

The remainder of the paper is organized as follows. I develop the testable hypotheses in section 2, and section 3 discusses the sample selection criteria and research methodology.

[5] Please refer to Watts (2003a, 2003b) for a detailed survey of empirical papers examining the demands and supply of accounting conservatism prior to the year of 2003.

[6] In a concurrent working paper, Garcia Lara et al. (2010b) find that conditional conservatism can alleviate rather than aggravate underinvestment as predicted in this paper. The authors use C-score as the measure of conditional conservatism based on Khan and Watts (2010). Khan and Watts (2010) measure accounting conservatism as a function of firm market to book value, leverage, and firm size. All three variables have been documented by prior literature as important factors that affect firm investment policies. Hence, using C-score as the measure of conservatism can cause serious endogneity problem because firm market to book value, size, or firm leverage can determine simultaneously firm accounting conservatism and investment policy rather than accounting conservatism affecting firm investments. In addition, Garcia Lara et al. (2010b) assume perfect interest alignment between shareholders and managers; whereas, the assumption underlying this paper's arguments is that there exists agency problem and managers are not acting for the best interests of shareholders.

Section 4, 5 and 6 presents the empirical results and is followed by the robustness test in section 7. The paper concludes in section 8.

## 2. Accounting Conservatism, Corporate Investment, and Hypotheses Development

Separation of ownership and control causes agency problems (Jensen and Meckling, 1976), and one such agency problem concerns firm investment decisions. Shareholders want managers to undertake every positive NPV project to maximize firm value. However, managers whose utility closely tied to accounting earnings also compare their personal gains and costs associated with undertaking a project. Managers may decide to forego positive NPV projects or undertake negative NPV projects if the benefits of undertaking or foregoing the projects are greater than the costs, resulting in both over and underinvestment.

Prior literature argues that timely loss recognition is an important governance mechanism in deterring managers from undertaking negative NPV projects by accelerating future investment losses into current earnings. Please refer to Watts (2003a), Shivakumar and Watts (2005), and Francis and Martin (2010) for a thorough discussions on how conservatism can constrain overinvestment.[7]

Another strand of accounting literature however argues that untimely gain recognition can cause managers to abandon positive NPV projects. Leuz (2001) and Guay and Vierrecchia (2006) argue that untimely gain recognition can cause dysfunctional incentives for managers to abandon positive NPV projects. In particular, if gains are not timely recognized, then executives responsible for designing long-run investment policy may no longer be in office by the time gains are realized. Even if managers have long enough tenure horizons to benefit the gains, they may still find the benefits of undertaking the projects cannot offset the efforts of implementing

[7] Briefly, the authors argue that timely loss recognition can accelerate future losses into current earnings, in turn affecting managers' earnings based compensation and reputation. In addition, timely loss recognition can also timely alert corporate boards to investigate the causes of losses and threaten managers' job security.

the projects. This is so because managers are risk averse, and they require a higher discount rate on future gains in deriving the expected payoffs (Reichelstein, 2000). A positive NPV project to shareholders may become a negative NPV to the manager if gains are not recognized on a timely basis. Watts (2003a) also argue that both timely gain and loss recognition can "avoid dysfunctional outcomes related to limited tenure horizon." Watts' argument can be clearly conveyed by the following excerpts (Watts, 2003a, p. 211):

> "Ceteris paribus, managerial performance measures in compensation contracts, such as earnings, are more effective when they are timely and reflect the effects of the managers' actions on firm value in the period in which the actions are taken. Timeliness avoids dysfunctional outcomes associated with managers' limited tenure with the firm, often referred to as the manager's limited horizon. For example, a manager may forego positive net present value projects with near-term negative earnings because future earnings will reflect the benefits of the project after the manager has retired or left the firm."

Extant studies argue that accounting conservatism can restrain managers from investing in negative NPV projects through accelerated loss recognition (Ball and Shivakumar, 2005; Francis and Martin, 2010). In particular, the authors argue that if managers know ex ante that upon failure in pursuing a project, they have to book losses more timely and consequently their reputation and income linked compensation will be affected adversely, then ex ante, managers will choose not to invest in negative NPV projects. However, Roychowdhury (2010) argues that since risky projects are more likely to become negative projects, timely loss recognition can also cause risk-averse managers to avoid risky projects even though the projects have positive NPV to shareholders. Specifically, if managers know that in pursuing risky projects, they have to book losses more timely upon project failure and their reputation and income linked compensation will

be affected adversely, then they are less likely to undertake these investments ex ante even though those projects have positive NPV.

In sum, prior literature argues and shows that timely economic loss recognition can restrain managers from undertaking negative NPV projects. In addition, untimely gain recognition can aggravate managers' concerns over firm performance and motivate managers to forgo positive NPV projects, resulting in underinvestment. Despite the debate on the role accounting conservatism plays in executive's investment incentives, extant empirical studies only focus on accounting conservatism's role in constraining overinvestment incentives and none of the studies investigate whether accounting conservatism can also cause underinvestment. This paper tries to fill this gap and shed light on the debate. Further, the accounting literature argues that the underinvestment problem induced by accounting conservatism is more pronounced for firms whose CEOs have limited tenure horizon (Watts, 2003a) and for firms with high return variances in future payoff (Roychowdhury, 2010). I empirically test the cross-sectional variation and examine whether the underinvestment problem is more severe for firms whose managers have short tenure horizon and for firms that are likely to have risky projects in their investment opportunity set.

Jensen and Meckling (1976) argue that equity ownership can alleviate agency problem and align managers' interests with those of shareholders. In particular, since equity ownership can extend CEOs' horizons and provide incentives for managers to undertake positive NPV projects that create value for the firm in the long run, I also test whether equity ownership can alleviate the positive correlation between accounting conservatism and underinvestment.

The documented underinvestment for financially constrained firms due to conservatism doesn't necessarily mean that those firms are behaving irrationally in setting up accounting

conservatism policy. On the contrary, it is likely that conservatism is optimally chosen to maximize firm value. Given that managers' opportunistic behavior cannot be completely eliminated, this paper documents a residual loss in the equilibrium. For example, it is very costly for financially constrained firms to waste limited resources in negative NPV projects, and the benefits of imposing accounting conservatism will outweigh the potential costs of forgoing certain positive NPV projects. Alternatively, because the demands for conservatism comes from multiple sources such as creditors, auditors and managers' legal liability concerns etc., conservative reporting is not completely at the discretion of managers or corporate boards. Given that firm conservative reporting can be exogenously imposed upon managers by other forces (such as legal liability or regulations), it is possible that conservatism may not be optimally set for some firms, such as financially constrained firms. Please see section 5 for further discussion on this issue. (given the concern for legal liability, firms impose conservatism can still optimal and rational to avoid big losses in the future. The only one not optimal is the one due to regulation and demand from auditors, and firms have to use conservatism even though it is not optimal)

Additional concern is why managers cannot voluntarily disclose good news and potentially offset the negative impact of untimely gain recognition in earnings. Kothari, Shu and Wysocki (2009) document that firms' voluntary disclosure appears to favor the release of good news in a timely manner than bad news and the authors suggest that managers use voluntary disclosure of good news to offset the timely loss recognition in earnings. However, there are two reasons why voluntary disclosure of good news cannot completely solve the underinvestment problem induced by accounting conservatism. First, voluntary disclosure of good news is less credible and investors tend to discount the economic value of the disclosed good news. More

importantly, the underinvestment documented in this paper is related to managers' earnings-based incentives rather than stock-based incentives. Although prices can fully incorporate future good news, the impacts of conservatism on earnings are unchanged by voluntary disclosure of good news.

## 3. Sample selection and empirical design

### *3.1. Sample selection*

The initial sample is drawn from the intersection of COMPUSTAT and CRSP from 1987 to 2007. All observations included in the sample are required to have sufficient data to calculate accounting conservatism and investments. CEO equity ownership and tenure horizon information is obtained from EXECUCOMP data file.

Firms investing heavily in R&D expenditure are excluded from the sample observations. Specifically, firms investing more than 70% of their total investments in R&D expenditures are excluded from empirical analyses.[8] This sample restriction is imposed for two reasons. First, firms with heavy R&D expenditures are likely in a business that requires less tangible capital investments and hence decisions over capital investments are insignificant to those firms. Second, because R&D expenditures are expensed as they incur, firms with high R&D expenditures will have relatively lower earnings. In contrast, firms with high R&D expenditure enjoy higher stock returns because capital market rationally price in the future benefits of current R&D expenditures (Chan et al., 1990). Hence, high R&D expenditures can cause a negative relation between earnings and return and affect the measure of conditional accounting

[8] Specifically, I calculate annually the ratio of R&D expenditures over the sum of capital expenditures and R&D expenditures. If the ratio is over 70%, then the observation is excluded from the sample observations for that year. 9,029 firm-years are deleted from the sample due to this procedure (about 21% of the final sample observations). The results are not sensitive to other cutoff points. In the robustness test, I restrict the sample firms to those with no positive R&D expenditures and the results are qualitatively the same.

conservatism.[9] More importantly, firms investing heavily in R&D expenditures will have less available resources devoted to capital expenditures, confounding the relationship between the measure of accounting conservatism and investment.

The final sample for the empirical analyses consists of a total of 42,665 firm-year observations from 7,084 individual firms. After merging with the EXECUCOMP, the sample observation is reduced to 11,421 CEO-years with available data to measure CEO ownership and 4,410 CEO years with valid data to measure CEO tenure information. The exact number of observations used in empirical analysis varies with specific empirical testing. Following prior literature, I also delete all the financial firms and firms in regulated industries. All the variables are trimmed at the 1st and 99th percentile values in order to reduce the influence of extreme observations.

*3.2. Investment model*

To alleviate the concerns that some omitted correlated variables may simultaneously determine firm investment and accounting reporting, I regress firm net capital expenditure on variables that identified by prior literature to affect firm investments and use the residuals as my measure of firm investments. Specifically, I estimate the following equation each year:

$$Invest_{i,t+1} = \alpha_0 + \alpha_1 \ Q_{i,\,t} + \alpha_2 \ R_{i,\,t} + \alpha_3 \ SaleGrth_{i,\,t} + \alpha_4 \ Cash_{i,\,t} + \alpha_5 \ Leverage_{i,\,t} + e_{i,t+1} \quad (1)$$

The variable $Invest_{i,t+1}$ is the net capital expenditure for firm $i$ in year $t+1$ calculated as the difference between capital expenditures (CAPX) and depreciation expenses (XDP) scaled by the beginning year book value of asset (AT). Consistent with prior literature, I use firms' average q,

[9] To show the impact of R&D expenditures on the measure of conservatism, all the firms with positive R&D expenditures are sorted into quintiles based on the level of R&D expenditures, and Basu baseline model (equation 2) is estimated for each quintile. Unreported results show that the measure of accounting conservatism ($\beta_3$, as discussed in section 3.3) increases monotonically from 0.06 for the top quintile (highest R&D expenditure) to 0.13 for the bottom quintile (lowest R&D expenditure).

*Q*, to measure firm marginal q, a proxy for growth opportunity (Tobin 1969; Hayashi, 1982). Firm average q is calculated as the sum of the market value of equity (PRCC_F*CSHO) and total debt (DLC + DLTT) scaled by the beginning year assets (AT). Prior studies show that average q is a noisy measure of firm marginal q, and to alleviate the measurement error problems, other variables that are used by literature to proxy for firm investment opportunities are included in the model. Specifically, following Biddle et al (2009), Barro (1990), I include sales growth (*SaleGrth*) and stock return (*R*) as additional proxies for firm investment opportunity. *SaleGrth* is calculated as the percentage change in sales (SALE) in a given year, *R* is the twelve-month compounded returns beginning nine months prior to fiscal year and ending three months after the announcement of fiscal year earnings.

Farrazi et al. (1988) and Denis and Sibikov (2010) show that firm cash holdings can affect investments for financially constrained firms, and the variable *Cash* is added to control for differences in internal financing capability. Following Richardson (2006), *Cash* is measured as the cash flow from operation (OANCF) scaled by beginning year assets (AT). I also include firm leverage (*leverage*) to control for underinvestment due to debt overhang problems (Myers, 1977). Firm leverage is calculated as the book value of debt over the book value of assets (DLC + DLTT) / (AT). The residual $e_{i,t+1}$ captures the portion of investments that cannot be explained by those firm specific factors and is the main measure of firm investments, denoted as *RInvest*.

*3.3. Measure of accounting conservatism*

Accounting conservatism is measured using Basu's (1997) conditional conservatism specification. Basu (1997) estimates the following model:

$$X_{i,t} = \beta_0 + \beta_1 \ D_{i,t} + \beta_2 \ R_{i,t} + \beta_3 D_{i,t} * R_{i,t} + e_{i,t} \qquad (2)$$

where $X$ is earnings before extraordinary item (IB), scaled by the market value of equity at the beginning of the year (PRCC_F*CSHO); $R$ is the twelve month compounded returns as defined in previous section. $D$ is a dummy variable equal to 1 if return is negative and 0 otherwise. The coefficient $\beta_2$ measures earnings' timeliness of gain recognition and $\beta_3$ captures the incremental timeliness of loss recognition in earnings. In this paper, I interpret $\beta_3$ as the degree of accounting conservatism. In the empirical tests, I jointly test whether firm investment is 1) positively correlated with timely gain recognition ($\beta_2$) 2) negatively correlated with timely loss recognition ($\beta_2 + \beta_3$) and 3) negatively correlated with accounting conservatism ($\beta_3$).

*3.4. Empirical procedure*

One empirical challenge to investigate the underinvestment hypothesis is that both the underinvestment and overinvestment hypothesis predict a negative correlation between conservatism and firm investments. Based on prior studies' finding (as discussed later) that financially constrained firms are more (least) likely to suffer underinvestment (overinvestment), I partition the sample into financially constrained and unconstrained firms. If I observe a negative correlation between accounting conservatism and firm investments, then the negative correlation will suggest that conservatism can cause underinvestment rather constraining overinvestment for financially constrained firms. On the other hand, the interpretation of a negative correlation between conservatism and firm investment for financially unconstrained firms is ambiguous and can be consistent with both the under and overinvestment hypothesis.

Myer and Majluf (1984) show that information asymmetry can cause firms to turn down some positive investments opportunity due to increased external financing costs. Consistent with the theoretical argument, empirical studies show financially constrained firms are more likely to hold cash (Almeida et al, 2004) and the market perceives the value of cash holdings more

valuable for financially constrained firms (Faulkender and Wang, 2006). In a recently study, Denis and Sibikov (2010) show that greater holdings of cash are associated with higher levels of investments for constrained firms, and, more importantly, they find firm investments increase firm value significantly for financially constrained firms. Taken together, the results suggest that financially constrained firms suffer underinvestment due to limited access to external financing.

Following the literature (Almeida et al, 2004; Faulkender and Wang, 2006; Denis and Sibikov, 2010), I classify firms as financially constrained and unconstrained based on annual payout ratio, firm size, and S&P long term debt and domestic paper rating. Specifically, for each year, firms in the bottom (top) three deciles of the annual cash payout ratio distribution are classified as financially constrained (unconstrained) firms. Cash payout ratio is calculated as the ratio of dividends adjusted for repurchase of common shares over operation income ((DVC + PRSTKC)/OIBDP). Firms that fall in the bottom (top) three deciles of the firm size (AT) distribution is classified as constrained (unconstrained). Firms are classified as constrained if they have debt (both long term and short term) outstanding but never had their debts rated before (no S&P long-term debt or short-term debt rating).

The empirical strategy to investigate the under and overinvestment hypothesis relies on the predicted different relationship between conservatism and firm investment and future accounting performance for financially constrained and unconstrained firms. In particular, if accounting conservatism can reduce information asymmetry between lenders and borrowers and consequently reduce borrowers' cost of capital (Ahmed et al., 2006; Zhang, 2008; Garcia Lara et al., 2010a), then accounting conservatism can mitigate the adverse effects of financial constraints on firm investments. Hence, we should expect a positive correlation between conservatism and firm investment for financially constrained firms. However, if we still observe a negative

correlation between accounting conservatism and firm investment after controlling for firm investment opportunity, then this negative correlation is consistent with the argument that accounting conservatism can cause underinvestment. In addition, if conservatism can aggravate underinvestment problem for financially constrained firms, then we should also expect a negative correlation between conservatism and firm future performance because underinvestment will have a negative effect on firm future performance. In contrast, a negative correlation between conservatism and investment for financially unconstrained firms are consistent with both the under and overinvestment hypothesis. However, if we observe a positive (negative) correlation between conservatism and future firm performance, then we can say that accounting conservatism can constrain (cause) underinvestment (underinvestment) for financially unconstrained firms since firms' future performance will improve (deteriorate) due to accounting conservatism.

The empirical model is based on the expanded Basu's model by interacting *RInvest* measured at time *t+1* with *D*, *R,* and *D * R* separately.[10] LaFond and Watts (2008) and Francis and Martin (2010) also use the similar model specification when examine whether accounting conservatism measured at time period *t* can lead to reduced information asymmetry or higher acquisition returns at time *t+1*. Specifically, I estimate the following pooled and cross-sectional model separately for financially constrained and financially unconstrained firms:

$$
\begin{aligned}
X_{i,t} = {} & \beta_0 + \beta_1 D_{i,t} + \beta_2 R_{i,,t} + \beta_3 D_{i,t} * R_{i,t} + \beta_4 RInvest_{i,t+1} + \beta_5 RInvest_{i,t+1} * D_{i,t} \\
& + \beta_6 RInvest_{i,t+1} * R_{i,,t} + \boldsymbol{\beta_7 RInvest_{i,t+1} * D_{i,t} * R_{i,t}} + \beta_8 Leverage_{i,t} \\
& + \beta_9 leverage_{i,t} * D_{i,t} + \beta_{10} Leverage_{i,t} * R_{i,,t} + \beta_{11} Leverage_{i,t} * D_{i,t} * R_{i,t} \\
& + \beta_{12} Size_{i,t} + \beta_{13} Size_{i,t} * D_{i,t} + \beta_{14} Size_{i,t} * R_{i,,t} + \beta_{15} Size_{i,t} * D_{i,t} * R_{i,t} \\
& + \beta_{16} MTB_{i,t} + \beta_{17} MTB_{i,t} * D_{i,t} + \beta_{18} MTB_{i,t} * R_{i,,t} + \beta_{19} MTB_{i,t} * D_{i,t} * R_{i,t} \\
& + \beta_{20} LIT_{i,t} + \beta_{21} LIT_{i,t} * D_{i,t} + \beta_{22} LIT_{i,t} * R_{i,,t} + \beta_{23} LIT_{i,t} * D_{i,t} * R_{i,t} \\
& + u_t + v_j + e_{i,t} \qquad (3)
\end{aligned}
$$

[10] I measure firm investment at time *t+1* to alleviate the concern of endogneity problem and enhance the causality inference. Unreported results show that the inferences remain same if investments are measured at time *t*.

where *RInvest* is the residuals from equation (1). Both under and overinvestment hypotheses predict that the coefficient on *RInvest * R* ($\beta_6$) will be positive, suggesting that timely gain recognition is positively correlated with firm investment, and the coefficient on *RInvest * D * R* ($\beta_7$) and the sum of $\beta_6 + \beta_7$will be negative and significant, suggesting that both aymmetry timely of earnings and timely loss recognition is negatively correlated with firm investment.

To alleviate the correlated omitted variable problem, I also control for variables documented by prior studies that can affect firm accounting conservatism. Specifically, I include firm leverage (*Leverage*), market to book value of equity (*MTB*), firm size (*Size*), litigation risk (*LIT*), and their interactions with dummy D, return (*R*), and negative returns (*D * R*). *Leverage* is firm leverage as defined in previous section. Prior studies show that firm leverage is positively correlated with accounting conservatism due to the demand by creditors (e.g., Kahn and Watts, 2009) and I expect $\beta_{11}$ to be positive and significant. *Size* is the natural log of the book value of assets (AT), and a negative and significant $\beta_{15}$ is consistent with literature's findings that large firms are less conservative. *MTB* is the ratio of market value of equity over the book value of equity (PRCC_F * CSHO / CEQ). The literature (e.g., LaFond and Roychowdhury, 2008) has shown a negative correlation between accounting conservatism and market to book value;[11] hence, $\beta_{19}$ is expected to be negative. *LIT* is a dummy variable equal to one if a firm is in a high litigation risk industries as identified in Francis et al. (1994) and zero otherwise. A positive and significant coefficient estimate of $\beta_{23}$ is expected because firms in high litigation industry will be more conservative. Lastly, I also include two-digit SIC industry dummy and year dummy variables to control for year and industry effects on accounting earnings.

[11] Roychowdhury and Watts (2007) provide explanations why firms with a high growth option (MTB) have lower accounting conservatism.

Likewise, to test the relationship between conservatism and firm future performance, I replace the variable *RInvest* with changes in operating performance (*ΔPeform)* measured by change in return on assets (*ΔROA*) and change in cash from operation (*ΔCFO*). *ΔROA* is calculated as the difference in net income (IB) scaled by total assets (AT) from year t-1 to year t+2. *ΔCFO* is calculated as the difference in cash flow from operations (OANCF) scaled by total assets (AT) from year t-1 to t+2. This modified equation is also estimated separately for financially constrained and unconstrained firms.

Standard errors of coefficient estimates are adjusted for heteroskedasticity and clustered at the firm level. Statistical significance of coefficient estimates reported in the paper is based on two-tailed tests.

## 4. Empirical results

### *4.1. Descriptive statistics and univariate analysis*

Panel A, table 1 reports summary statistics for the dependent and independent variables used in the empirical analyses. The mean ratio of net capital expenditures to firm assets (*Net Capex*) is 2.7% and median ratio is 1%. The mean of the residual capital expenditures (*RInvest*) from the investment model is 0 by construction, and the median value is -0.009. The mean value of earnings (*X*) is 0.026 with a median value of 0.05. The mean (median) value of return (*R*) is 13.3% (4.6%). On average, firms pay out 10.3% of the total earnings to shareholders, and there are total of 25% (10%) firms have available bond rating (paper rating), which is consistent with those found in Faulkender and Wang (2006). The percentage of equity ownership including options (*CEO_Own*) is 4% and 2% for the mean and median respectively, similar to those reported by LaFond and Roychowdhury (2008). Standard deviation of daily return volatility (*RetVol*) is comparable to those reported by Kahn and Watts (2009). Return on assets decrease

by 1.4% on average from *t-1* to *t+2* (*ΔROA*) but cash flow from operations barely changes over the same time period (*ΔCFO*). The mean and median values for the other control variables, namely market to book value (*MTB*), leverage (*Leverage*), and firm size (*Size*) are similar to those reported by prior studies.

Panel B of table 1 reports the Pearson correlation matrix between selected variables. As expected, firm investments are significantly and positively correlated with prior year's stock returns, average q and sales growth, all of which are used as proxies for firm investment opportunity set by prior studies. Not surprisingly, these variables are positively correlated with each other, and the highest correlation is between stock returns and average q (0.167) and the lowest correlation is between sales growth and return (0.077). Hence, these variables capture different aspects of firm investment opportunity. As expected, firm investments is negatively correlated with firm leverage, consistent with the notion of debt overhang problems. Overall, the summary statistics show that the distributions of variables and the correlation are consistent with the findings of prior studies.

Table 2 provides results of univariate analysis on the relationship between accounting conservatism and residuals from investment model (*RInvest*) in panel A and net capital expenditures (*Net Capex*) in panel B. To conduct the test, I first sort sample observations into quintiles based either on *RInvest* or *Net Capex* and then estimate Basu model of accounting conservatism separately for each quintile. Panel A shows that there is a monotonic positive correlation between $\beta_2$ and *RInvest* ($\beta_2$ estimates increase from 0.01 in the bottom *RInvest* quintile to 0.039 in the top *Rinvest* quintile) and a monotonic negative correlaiton between $\beta_3$ and *Rinvest* ($\beta_3$ decrease from 0.152 in the botton quintile to 0.082 in the top quintile) suggesting that investments positively correated with timely gain recongition and negatively correlated with firm

asymmetric timliness of earnings. Panel B provides results on the relaitonship between net capital expenditure and the measure of accounting conservatism. Consistent with the results in panel A, net capital expenditure and conservatism are also negatively correlated. In sum, the univariate analysis provides evidence that firm invesment is negatively correlated with accounting conservatism. However, as argued before, this negative monotonic correlation does not answer the question whether conservatism constrain overinvestment or cause underinvestment. In next section, I will provide results shed light on this issue.

*4.2. Multivariate analyses*

Table 3 provides results from multivariate analyses testing the relationship between conservatism and firm investments conditional on firm financial status. Column (1) provides results estimating equation (3) based on the whole sample. As shown in column (1), the estimated coefficient on *RInvest * R* ($\beta_6$) and *RInvest * D * R* ($\beta_7$) are 0.057 and -0.199 respectively, and both are statistically significant at the 5% level. Further, the sum of $\beta_6 + \beta_7$ is significantly negative at the 5% level. Consistent with results from the univariate analysis, results based on multivariate tests also show that firm investment is positively correlated with timely gain recognition and negatively correlated with timely loss recognition and asymmetric timeliness of earnings. As discussed before, this negative correlation is consistent with both underinvestment and constraining-overinvestment hypotheses. To investigate whether accounting conservatism can cause underinvestment, column (2) to column (8) report estimation results based on firm financial status, a proxy for the likelihood that a firm suffers underinvestment ex ante. As shown in the table, the coefficient estimates of $\beta_6$ and $\beta_7$ are statistically significant at the 10% level or better with expected signs across all four groups of financially constrained firms. Further the F-tests indicate that the sums of the two coefficients are

negative and significant at the 5% level for all the groups as well. As discussed before, because financially constrained firms are less likely to suffer underinvestment, the results from this table show that rather than mitigating the adverse impacts of financial constraints on firm investments (suggesting a positive correlation between conservatism and firm investment), accounting conservatism is associated with less investment for financially constrained firms after controlling for firm investment opportunity. This negative correlation is consistent with the underinvestment hypothesis. For the financially unconstrained firms, the majority estimates of the coefficient $\beta_6$ and $\beta_7$ are statistically significant with the same signs as for financially constrained firms. However, as discussed before, the negative (positive) coefficient of $\beta_7$ ($\beta_6$) is consistent with both the under and overinvestment hypothesis. My next empirical test sets to disentangle these two competing hypotheses. The coefficient estimates on the control variables are all loaded with expected signs and statistically significant at 10% level or better. To save space, those estimates are not reported.

To provide further evidence on the role conservatism plays in managers' investment incentives, table 4 provides estimation results testing the relationship between conservatism and changes in future firm performance. Panel A of table 4 reports results based on *ΔROA* as the measure of operating performance and panel B reports results based on *ΔCFO* as the measure of operating performance. Consistent with the underinvestment hypothesis, the coefficient estimates on *ΔROA * R* are positive and significant at the 10% level for two of the four groups of the financially constrained firms and the coefficient estimates on *ΔROA * R * D* is negative and significantly different from zero for three of the four financially constrained groups. The sums of the two coefficients are significantly negative at the 10% level or better for all the financially constrained groups except for the paper-rating group. Consistent with the underinvestment

hypothesis, the results suggest that accounting conservatism can cause future performance to deteriorate for financially constrained firms because under invest in positive NPV projects.

For financially unconstrained firms, the coefficient estimates on $\Delta ROA * R$ are negative across all four group classifications but significant only for two groups. The coefficient estimates on $\Delta ROA * R * D$ are mixed. It is positive and significant ($\beta_7 = 0.038$, $p = 0.057$) for the payout group and negative and significant ($\beta_7 = -0.175$, $p = 0.087$) for the bond rating group. For the other two groups, it is positive but not significant. Hence, results for financially unconstrained firms are not as clear as those for financially constrained firms. Nevertheless, since all the coefficient estimates of $\beta_6$ are negative and three of the estimates of $\beta_7$ are positive, the results suggest that overinvestment is a dominant factor for financially unconstrained firms and accounting conservatism can constrain overinvestment and improve firm future performances. Panel B based on $\Delta ROA$ provides qualitatively similar results.

Taken together, results from table 3 and 4 provide consistent and strong evidence that accounting conservatism can cause financially constrained firms to under invest. But the results provide consistent but statistically weak evidence that accounting conservatism can also constrain overinvestment for financially unconstrained firms.

**5. Endogenous choices of conservatism and firm investment**

It is expected that firms make decisions regarding corporate reporting policies and investment policies jointly. A firm's operating environment, legal risk and nature of agency problem it faces can influence both investment behavior and accounting reporting. In the previous empirical tests, several steps are taken to alleviate the endogeneity problem. For example, I measure firm investment at time $t+1$ and accounting conservatism at $t$, which reduces the extent of endogeneity problem arising out of simultaneous determination of these variables.

Second, I use residuals of the investment model as the main measure of investments to alleviate the concern that variables determine firm investments may also simultaneously affect firm accounting reporting policy. Lastly, I also include other variables in the expanded Basu's model to control for other factors that can affect firm accounting conservatism.

To further alleviate the endogeneity concern, I exploit the passage of SOX in 2002. The passage of SOX increases legal liability and fines for managers for issuing false statements. One implication of this increased fines and regulatory scrutiny is that managers have greater incentives to avoid using their discretion to overstate earnings and to be more conservative when faced with uncertainty and increased legal liability. For example, Browning (2002) notes that "requiring chief executives at the nation's largest companies to personally endorse the company's financial filings and face punishment if the filings are false, could make some companies file unexpectedly conservative number."

Empirical studies provide supporting evidence that managers indeed become more conservative in reporting accounting information after SOX. Lobo and Zhou (2006) find that firms report lower discretionary accruals after SOX than in the period preceding SOX. Using a quasi natural experiment setting, Iliev (2010) also document that firm discretional accruals decrease significantly after the passage of SOX. Further, using Basu's measure of conservatism, Lobo and Zhou (2006) also document that firms incorporate losses more quickly than gains when they report income in the post-SOX period. The key assumption in this section's empirical tests is that this change in firm conservative reporting after the passage of SOX, which occurred in response to a change in the regulation rule, is exogenous to the firm's investment decisions.[12]

[12] Bargeron, Lehn, and Zutter (2010) show that capital investments by U.S. publicly traded firms declined after the passage of SOX because increased legal liability and enhanced internal controls cause managers to take on less risk. Hence, it is possible that increased legal liability cause managers to report conservative accounting and reduce firm investment simultaneously. However, this explanation is unlikely because firm investment opportunities are only

To empirically test whether the measure of conservatism increases in the period of post SOX for my sample firms, I estimate an expanded Basu's model by interacting a dummy variable *Post*, which takes the value 1 if the fiscal year is after 2002 and 0 otherwise. I interact the variable *Post* with variable *R*, *D,* and *R * D* separately. In addition, I also include firm leverage, market to book, litigation dummy variable and two-digit SIC industry indictors as additional controls. Specifically, I estimate the following model:

$$X_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 R_{i,,t} + \beta_3 D_{i,t} * R_{i,t} + \beta_4 Post_{i,t+1} + \beta_5 Post_{i,t+1} * D_{i,t} + \beta_6 Post_{i,t+1} * R_{i,,t} + \beta_7 Post_{i,t+1} * D_{i,t} * R_{i,} + \beta_i Control\ Variables + v_j + e_{i,t} \quad (4)$$

Results are reported in table 5. As shown the table, the coefficient on *Post * R * D* is positive and significant (0.039 with p-value of 0.000) without adding additional control variables. After controlling for other factors that affect firm conservatism, the coefficient decreases to 0.037 and significant at the 1% level. Likewise, the coefficient on *Post * D* is negative and significantly different from zero for both model specifications. Overall, results in this table are consistent with the findings of prior studies that firms are become more timely in incorporating bad news and less timely in incorporating good news into earnings after the passage of SOX.

Next, I examine how the passage of SOX affects firm investment behaviors. Empirically, I estimate a modified equation (1) by adding two additional variables *Post* and *FC* and the interactive variable, *Post * FC*. *FC* is an indicator variable equal to 1 if the firm is classified as financially constrained and 0 if the firm is classified as financially unconstrained. The

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observable to managers and corporate boards or internal control system cannot directly affect managers' investment behavior, contradicting Bargeron et al.'s assumption. Instead, corporate boards can affect firm investment behavior indirectly through executive compensation contracts (Dechow and Sloan, 1991; Gibbon and Murphy, 1992). I argue in this paper that because managers are personally responsible for the reliability of reported accounting information, the legal liability for misreporting increased. To reduce the potential legal liability, managers will report conservatively. Consequently, because managers' compensation, reputation and career security is tied to accounting earnings, they decide to invest in less risky asset in the period after SOX. Hence, the argument in this paper provides an explanation for Bargeron et al's findings.

classification of financially constrained and unconstrained is same as those discussed in previous section. Using the dummy variable *Post* as an instrument for firm conservatism, I examine whether firm investments decrease significantly after the passage of SOX and whether the decrease is more pronounced for financially constrained firms relative to unconstrained firms. The particular interest is the coefficient on the variable *Post * FC*. A negative coefficient on the variable *Post * FC* would suggest that the passage of SOX (increased conservatism) can cause financially constrained firms to reduce investment in the periods after SOX, aggravating underinvestment problem.

Table 6 reports estimation results. Column (1) presents results based on full sample. Consistent with the predictions and the findings by Bargeron, Lehn, and Zutter (2010), the coefficient on *Post* is significantly negative, suggesting that firm investments decrease significantly after the passage of SOX. More importantly, the results from column (2) to (5) show that the coefficients on *Post * FC* are significantly negative for all four financial constraint classifications. Hence, the passage of SOX (the increase in conservatism) causes financially constrained firms to decrease their investments significantly more. Therefore, the exogenous increase in conservatism aggravates the underinvestment problem faced by financially constrained firms. Interestingly, the coefficient on *FC* is positive and significant suggesting that financially constrained firms invest more than unconstrained firms. This finding is same as the findings in Faulkender and Wang (2006) and Denis and Sibikov (2010).

I also re-examine equation (3) and investigate the changes in the relationship between conservatism and firm investment pre and post the passage of SOX for financially constrained firms. Specifically, I compare the coefficient changes ($\beta_6$, $\beta_7$ and $\beta_6 + \beta_7$) pre and post the passage

of SOX for financially constrained firms.[13] Table 7 provides results. As shown in the table, the coefficient estimates of $\beta_6$ increase significantly and coefficients of $\beta_7$ decrease significantly post SOX. The results hold for both the whole sample and the four financial constraint groups. All the difference are significantly at the 5% level. Hence, the results provide further evidence that the passage of the SOX increases the level of conservatism. Consequently firms reduce their investmetns after the exogenous increase in conservatism.

**6. Cross sectional tests**

In this section, I explore the cross-sectional implications of the underinvestment hypothesis for the financially constrained firms. As discussed in section 2, I expect the negative correlation between investment and accounting conservatism be more pronounced for firms with short-tenured CEOs and for firms with risky operating environment. In addition, since the documented underinvestment is a part of agency costs, I also explore whether CEO equity ownership can alleviate this underinvestment problem. That is, I expect that the negative correlation between conservatism and firm investment is more pronounced for firms with low CEO equity ownership.

To test these conjectures, I limit my sample firms only to the financially constrained firms. I further partition the financially constrained firms into two subgroups with high and low underinvestment incentives. And then I estimate equation (3) separately for the two subgroups. Following Dechow and Sloan (1991) and Gibbon and Murphy (1992), the measure of CEO tenure horizon is based on the number of years before a CEO leaves office (*Horizon*). Firms with CEOs leaving office within two years are sorted into the short-horizon subgroup (high underinvestment incentive group). If CEOs are at least three years away from leaving office, then those firms are sorted into the long-horizon subgroup (low underinvestment incentive

[13] Results for financially unconstrained firms are qualitatively same.

group). Following Kahn and Watts (2009), I use the standard deviation of daily stock return to measure the volatility of firm operating environment, denoted as *RetVol*. Firms with high return volatility are arguably to have more risky projects in their investment opportunity set, and firm-years with *RetVol* higher than the median of the subsample are sorted into high risk subgroup (high underinvestment incentive group). Likewise, *RetVol* lowers than the median is labeled sorted into low risk subgroup (low underinvestment incentive group). To test whether CEO equity ownership can alleviate the underinvestment problem induced by conservatism, firm-year observations are sorted into high and low ownership subgroup based on CEOs' total equity ownership. Prior studies (Jensen and Murphy, 1990; Arggarwal and Samwick, 1999) show that the vast majority of incentive alignment provided by compensation is due to a CEO's ownership of stocks and options. Hence, I use the percentage of CEOs' equity holding in the form of both stocks and options over the total number of outstanding common stocks (*CEO_Own*) to proxy for the degree of incentive alignment. Firm-years with CEOs' equity ownership higher (lower) than the median ownership of the subsample are sorted into the high (low) equity ownership subgroup (High ownership corresponds to lower underinvestment incentive). Because data on CEO equity ownership and tenure horizon is obtained from ExecComp, which are available after 1992 for relatively large firms, the sample size for this section's tests are decreased significantly.

Table 8 provides results on testing the cross sectional variation. To save space, I only tabulate the results for financial constrained firms measured by payout ratio. Results based on other measures of financial constraint are qualitatively same and are not reported. Further, to increase the sample size, I use the median payout ratio of the sample as the cutoff point and classify firms with payout ratio less than sample median as financially constrained rather than bottom 30 percentile. Columns labeled *Horizon, RetVol* and *CEO_Own* report results for testing

the relationship between conservatism and firm investment conditional CEO tenure horizon, firm risk, and CEO equity ownership respectively. As predicted, the estimated coefficients of $\beta_6$ on *RInvest * R* are positive and significant (except for the short *Horizon* column) and $\beta_7$ on *RInvest * R * D* are negative and significant for the short horizon, high risk, and low equity ownership subgroups, but not significant for the other subgroups. The differences of $\beta_6$ and $\beta_7$ across three sets of partitioned subgroups are significant at the 1% level except for the difference of $\beta_6$ in the *Horizon* column. Coefficient estimates on control variables are not reported to save space, but they are all significant and loaded with expected signs.

## 7. Robustness check

### 7.1. *The effect of R&D expenditure on the relationship between accounting conservatism and investment.*

As discussed in prior section, firms invest relatively heavily in research and development costs are excluded from the sample because large research and development costs can cause a negative relation between earnings and returns, and this negative correlation can affect the measurement of conservatism and confound the association between accounting conservatism and firm investment. Excluding firms investing more than 70% of their total investment in R&D can alleviate this problem, but not totally eliminate the problem. To further alleviate the concerns over the possible confounding effect, I rerun all the empirical tests by excluding firm-years with positive research and development costs.

The sample size is reduced by almost half after excluding firm-years with positive R&D expenditures. Consistent with the first hypothesis, the untabulated results show that the coefficient estimates on $RInvest_{i,t+1} * D_{i,t} * R_{i,t}$ are significantly negative across both all specifications (-0.392 and -0.262 respectively for financially constrained and unconstrained firms based on payout classification). Therefore, the negative correlation between accounting

conservatism and investment for financially constrained firms is robust after excluding firms with positive R&D expenditures.

*7.2. Alternative measure of firm investments*

In this section, I use two alternative measures of firm investments to show the robustness of the documented relationship between conservatism and firm investments. First, I use changes in investments from year *t* to *t+1* scaled by book value of asset at year t and firm total investments as the measure of investments. Following Richardson (2006), the total investment is calculated as the sum of all outlays on capital and acquisition expenditures less receipts from the sale of property, plant and equipment (CAPX + AQC – SPPE) scaled by the beginning year book value of assets (AT). Specifically, I replace variable *RInvest* with changes in investment in equation (3) and estimate equation (3) separately for financially constrained and unconstrained firms. When investment is measured as total investment, I first replace variable *Invest* in equation (1) with the measure of total investment and then use the residuals as the measure of investment and estimate equation (3) for financially constrained and unconstrained firms. Untabulated results show qualitatively same results as shown in table 3 and table 4.

*7.3. Firm investment opportunity, accounting conservatism and firm investment*

LaFond and Roychowdhury (2008) and Kahn and Watts (2009) show that conditional conservatism is positively correlated with firm investment opportunity set (measured as market to book value of equity). This is so because high growth firms may need more external financing to realize future growth opportunity. Because conservative accounting policy reduces information asymmetry and enhances contracting efficiency, we should expect firms with high investment opportunity set will be more conservative. Hence, investment opportunity set may drive both conservatism and future investment policy (a positive correlation between investment

and accounting conservatism). But this positive correlation is the opposite of my prediction (a negative correlation between conservatism and investment). Roychowdhury and Watts (2007) argue and find that Basu's accounting conservatism measured over short time interval can cause a negative correlation between conservatism and firm market to book value because short-time interval measure of conservatism contains some measurement errors. Hence, it is likely that the measurement error of conservatism can drive the negative correlation between conservatism and investment, which are determined simultaneously by investment opportunity set. Although I have controlled firm investment opportunity in the empirical tests, to further reduce any concern, following Roychowdhury and Watts (2007), I measure accounting conservatism over a long time interval to reduce the measurement error problem. Untabulated results show that the negative correlation between conservatism and firm investments for both financially constrained and unconstrained firms are not changed.

## 8. Conclusion and discussion

Accounting literature has debated over the role of accounting conservatism on managers' investment incentives. However, extent empirical studies only focus on how accounting conservatism can reduce managers' overinvestment tendency and none of them have investigated whether accounting conservatism can also cause underinvestment. This study provides initial empirical evidence whether accounting conservatism can cause dysfunctional investment incentives for managers. Based on an expected investment model, I use the residuals of the model as the main measure of firm investments and document that accounting conservatism is negatively correlated with firm investments for financially constrained firms. Because financially constrained firms are more likely to suffer underinvestment ex ante, the negative correlation between conservatism and investment indicates that conservatism can cause

underinvestment for financially constrained firms. Further evidence show that accounting conservatism is also negatively correlated with firm future performance for financially constrained firms, lending additional support that accounting conservatism can cause dysfunctional investment incentives. Lastly, consistent with literature's arguments, I also find that the negative correlation between conservatism and investment is more pronounced for risky firms and for firms with short-horizon CEOs. Consistent with Jensen and Meckling (1976), I also find that CEOs' equity ownership can alleviate this negative correlation, suggesting that equity ownership can align managers' interests with those of stockholders and reduce the agency costs related to firm investment policy. Using the passage of SOX as an exogenous shock to firm conservatism, I document that firm investments decrease significantly in the period post SOX and the decrease is more significant for financially constrained firms. Taken together, empirical results provide consistent and robust results suggest that conservatism can cause underinvestment for financially constrained firms.

Prior literature documents ample evidence regarding the benefits of accounting conservatism, and this paper contributes to this line of literature by providing a more complete picture on the economic impacts of accounting conservatism. Nevertheless, the results of the paper do not suggest that financially constrained firms behave irrationally and adopt accounting conservatism at a suboptimal level. On the contrary, financially constrained firms optimally trade off costs and benefits of accounting conservatism and are willing to bear the costs of accounting conservatism given the benefits they enjoy as long as the benefits outweigh the costs. Alternatively, it is also likely that external forces (like regulation and legal liability) cause firms to adopt conservatism at an suboptimal level and cause underinvestment problems.

This study also contributes to the literature examining managers' earnings related investment incentives. In particular, this paper documents the exact property of accounting earnings that incentivizes managers to behave myopically when their welfare is tied to accounting earnings.

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Appendix – Variable Definitions

Dependent Variables:

| | |
|---|---|
| *Net Capex*: | Capital expenditure from cash flow statement (CAPX) net of depreciation expenses (XDP) scaled by assets scaled by beginning year book value of asset (AT); |
| *RInvest*: | Residual values from estimating the investment model equation (1); |
| *Total Investments*: | Sum of all outlays on capital and acquisition expenditure less receipts from the sale of property, plant and equipment (CAPX + AQC – SPPE) scaled by beginning year book value of asset (AT); |
| *ΔCapex:* | Change in capital expenditures from year t to year t+1 scaled by assets at year *t*; |
| *X*: | Earnings before extroadinary item (IB) scaled by the market value of equity at the beginning of the year (PRCC_F * CSHO); |

Independent Variables:

| | |
|---|---|
| *R*: | Twelve month compounded returns beginning nine month prior to fiscal year and ending three month after the announcement of fiscal year earnings; |
| *D*: | Dummy variable equal to 1 if return is negative and 0 otherwise; |
| *Q*: | Tobin's q, calculated as sum of market value of equity and total debt (PRCC_F * CSHO + DLC + DLTT) scaled by the beginning year assets (AT); |
| *Leverage*: | Firm's leverage is calculated as the book value of debt over book value of assets (DLC + DLTT) / (AT); |
| *Size*: | The log value of assets (AT); |
| *MTB*: | Market to book value of equity, calculated as the ratio of market value of equity over book value of equity (PRCC_F * CSHO /CEQ); |
| *SaleGrth*: | The percentage changes in sales (SALE) in a given year; |
| *LIT*: | a dummy variable equal to one if a firm falls in high litigation risk industry as identified in Roychowdhury and Watts (2008) and zero otherwise; |

| | |
|---|---|
| *Cash*: | Cash flow from operation (OANCF) scaled by beginning year assets (AT); |
| *Own_WO*: | The total number of stocks, options owned by the CEO over the total stocks outstanding; |
| *Debt Rating*: | S&P LT domestic issuer credit rating (SPLTICM); |
| *Paper Rating:* | S&P short term debt rating (SPSTICM); |
| *Payout*: | Total dividends adjusted for repurchase of common shares over operation income ((DVC + PRSTKC)/OIBDP); |
| *Post*: | Dummy variable equal 1 if fiscal year is after 2002 and 0 otherwise; |
| *RetVol*: | Standard deviation of firm daily stock return for year t; |
| *Horizon*: | Number of years before a CEO leaves office; |
| *ΔROA:* | Difference in net income (IB) scaled by total assets (AT) from year t-1 to year t+2; |
| *ΔCFO:* | Difference in cash flow from operations (OANCF) scaled by total assets (AT) from year t-1 to year t+2; |
| $u_t$: | Year indicator variable; |
| *v:* | Two-digit SIC code industry indicator variable. |

Table 1
Descriptive Statistics

Panel A: Summary Statistics

| Firm Characteristics | N | Mean | Median | 25th | 75th | Std. Dev. |
|---|---|---|---|---|---|---|
| $X_t$ | 42,655 | 0.026 | 0.048 | 0.115 | 0.001 | 0.083 |
| $R_t$ | 42,655 | 0.133 | 0.046 | 0.535 | -0.210 | 0.355 |
| $Q_t$ | 42,655 | 1.665 | 1.182 | 0.829 | 1.924 | 1.405 |
| $Net\ Capex_{t+1}$ | 42,655 | 0.027 | 0.010 | -0.007 | 0.042 | 0.061 |
| $RInvest_{t+1}$ | 42,655 | 0 | -0.009 | -0.028 | 0.014 | 0.055 |
| $Leverage_t$ | 42,655 | 0.195 | 0.174 | 0.169 | 0.301 | 0.316 |
| $MTB_t$ | 42,655 | 2.691 | 1.933 | 2.434 | 1.218 | 3.224 |
| $Size_t$ | 42,655 | 5.256 | 5.053 | 1.877 | 3.842 | 6.525 |
| $LIT_t$ | 42,655 | 0.280 | 0.000 | 0.000 | 1.000 | 0.449 |
| $Cash_t$ | 42,655 | 0.051 | 0.067 | 0.009 | 0.125 | 0.127 |
| $Payout_t$ | 40,140 | 0.103 | 0.053 | 0 | 0.203 | 1.071 |
| $Bond\ Rating_t$ | 42,655 | 0.252 | 0 | 0 | 1 | 0.434 |
| $Paper\ Rating_t$ | 42,655 | 0.100 | 0 | 0 | 0 | 0.300 |
| $SaleGrth_t$ | 42,655 | 0.189 | 0.104 | 0.011 | 0.275 | 0.569 |
| $RetVol_t$ | 42,655 | 0.032 | 0.029 | 0.021 | 0.040 | 0.016 |
| $CEO\_Own_t$ | 11,421 | 0.043 | 0.019 | 0.008 | 0.044 | 0.070 |
| $\Delta ROA_{t-1,t+2}$ | 35,074 | -0.014 | -0.006 | -0.044 | 0.026 | 0.115 |
| $\Delta CFO_{t-1,t+2}$ | 35,074 | 0.001 | 0 | -0.003 | 0.002 | 0.599 |

Table 1 (Continued)

Panel B: Pearson Correlation

| | *X* | *Q* | *Capital Exp.* | *Leverage* | *MTB* | *Size* | *LIT* | *Cash* | *SaleGrth* | *Payout* | *RetVol* | *CEO_Own* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***R*** | **0.138** | **0.167** | **0.132** | **-0.055** | **0.191** | **-0.049** | **0.016** | **0.120** | **0.077** | 0.007 | **-0.233** | **0.031** |
| ***X*** | | **-0.075** | **0.119** | -0.006 | 0.017 | **0.105** | **-0.093** | **0.419** | **0.155** | **0.027** | -0.006 | **0.049** |
| ***Q*** | | | **0.110** | **-0.304** | **0.824** | **-0.119** | **0.156** | **-0.105** | **0.128** | 0.009 | **0.031** | **0.097** |
| ***Capital Exp.*** | | | | **-0.034** | **0.115** | **-0.092** | **0.115** | **0.186** | **0.078** | **-0.027** | -0.007 | **0.029** |
| ***Leverage*** | | | | | **-0.097** | **0.362** | **-0.181** | -0.005 | 0.003 | **-0.012** | **-0.023** | **-0.132** |
| ***MTB*** | | | | | | **0.056** | **0.062** | -0.067 | **0.137** | **0.015** | **-0.014** | 0.015 |
| ***Size*** | | | | | | | **-0.066** | **0.264** | **-0.047** | **0.033** | **-0.482** | **-0.278** |
| ***LIT*** | | | | | | | | -0.098 | **0.025** | -0.002 | **0.095** | **0.046** |
| ***Cash*** | | | | | | | | | -0.001 | **0.029** | **-0.209** | 0.007 |
| ***SaleGrth*** | | | | | | | | | | 0.001 | **0.060** | **0.093** |
| ***Payout*** | | | | | | | | | | | **-0.033** | 0.001 |
| ***RetVol*** | | | | | | | | | | | | **0.132** |

This table provides summary statistics and Pearson correlation between variables. The bold number of correlation indicates that the correlation is statistically significant at the 5% level or better, all the variables are defined in Appendix.

Table 2: Univariate Analysis – accounting conservatism and firm investment:

Panel A: Investment = *RInvest*

$Invest_{i,t+1} = \alpha_0 + \alpha_1 \ Q_{i,t} + \alpha_2 \ Cash_{i,t} + \alpha_3 R_{i,t} + \alpha_4 Leverage_{i,t} + \alpha_5 SaleGrth_{i,t} + e_{i,t+1}$

$X_{i,t} = \beta_0 + \beta_1 \ D_{i,t} + \beta_2 \ R_{i,t} + \beta_3 D_{i,t} * R_{i,t} + e_{i,t}$

| | 1 (Bottom) | 2 | 3 | 4 | 5 (Top) |
|---|---|---|---|---|---|
| | -0.056 | -0.024 | -0.009 | 0.009 | 0.049 |
| $\beta_2$ | 0.010 | 0.012 | 0.018 | 0.026 | 0.039 |
| $\beta_3$ | 0.152 | 0.131 | 0.109 | 0.081 | 0.082 |
| *N* | 8,531 | 8,531 | 8,531 | 8,531 | 8,531 |

Panel B: Investment = Net Capital Expenditures

$X_{i,t} = \beta_0 + \beta_1 \ D_{i,t} + \beta_2 \ R_{i,t} + \beta_3 D_{i,t} * R_{i,t} + e_{i,t}$

| | 1 (Bottom) | 2 | 3 | 4 | 5 (Top) |
|---|---|---|---|---|---|
| | -0.027 | -0.004 | 0.010 | 0.034 | 0.128 |
| $\beta_2$ | 0.004 | 0.010 | 0.012 | 0.012 | 0.014 |
| $\beta_3$ | 0.131 | 0.104 | 0.083 | 0.088 | 0.081 |
| *N* | 8,531 | 8,531 | 8,531 | 8,531 | 8,531 |

This table reports OLS estimations of Basu's conservatism model. All the variables are defined in Appendix.

Table 3: Multivariate Analysis –Accounting Conservatism and Underinvestment Based on Underinvestment Incentives

$$X_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 R_{i,,t} + \beta_3 D_{i,t} * R_{i,t} + \beta_4 RInvest_{i,t+1} + \beta_5 RInvest_{i,t+1} * D_{i,t} + \beta_6 RInvest_{i,t+1} * R_{i,,t} + \beta_7 RInvest_{i,t+1} * D_{i,t} * R_{i,t} + \beta_i Control\ Variables + u_t + v_j + e_{i,t}$$

| | Whole | *Payout* | | *Size* | | *Bond Rating* | | *Paper Rating* | |
|---|---|---|---|---|---|---|---|---|---|
| | Sample | Constr. | Uncon. | Constr. | Uncon | Constr. | Uncon | Constr. | Uncon. |
| *Intercept* | 0.045 | -0.059 | 0.074 | -0.075 | 0.028 | 0.032 | -0.024 | -0.011 | 0.062 |
| | *0.000* | *0.007* | *0.001* | *0.014* | *0.074* | *0.021* | *0.158* | *0.455* | *0.000* |
| *D* | -0.013 | -0.013 | -0.017 | -0.004 | 0.010 | 0.002 | -0.023 | -0.016 | 0.028 |
| | *0.001* | *0.209* | *0.008* | *0.741* | *0.453* | *0.983* | *0.065* | *0.006* | *0.075* |
| *R* | 0.046 | 0.049 | 0.044 | 0.056 | 0.083 | 0.029 | 0.033 | 0.039 | 0.079 |
| | *0.000* | *<.0001* | *<.0001* | *0.000* | *<.0001* | *0.213* | *0.001* | *<.0001* | *0.049* |
| *R * D* | 0.029 | 0.061 | 0.016 | 0.075 | 0.055 | 0.182 | 0.098 | 0.092 | 0.007 |
| | *0.031* | *0.023* | *0.519* | *0.062* | *0.435* | *0.023* | *0.000* | *<.0001* | *0.945* |
| *RInvest* | 0.129 | 0.173 | 0.155 | 0.021 | 0.206 | 0.216 | 0.119 | 0.138 | 0.198 |
| | *< .0001* | *<.0001* | *<.0001* | *0.532* | *<.0001* | *<.0001* | *<.0001* | *<.0001* | *<.0001* |
| *RInvest * D* | 0.023 | 0.007 | -0.019 | 0.065 | -0.038 | -0.062 | 0.004 | -0.007 | -0.064 |
| | *0.305* | *0.842* | *0.622* | *0.057* | *0.452* | *0.366* | *0.839* | *0.792* | *0.423* |
| ***RInvest * R*** | **0.025** | **0.091** | **0.074** | **0.065** | **0.036** | **0.081** | **0.045** | **0.057** | **0.042** |
| | ***0.050*** | ***0.034*** | ***0.065*** | ***0.043*** | ***0.204*** | ***0.032*** | ***0.064*** | ***0.047*** | ***0.288*** |
| ***RInvest * R * D*** | **-0.199** | **-0.228** | **-0.168** | **-0.301** | **-0.878** | **-0.678** | **-0.269** | **-0.302** | **-0.723** |
| | ***0.004*** | ***0.003*** | ***0.092*** | ***0.012*** | ***<.0001*** | ***0.005*** | ***0.002*** | ***0.000*** | ***0.103*** |
| *Control Variables* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Industry & Year Dummy* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Adjusted R-squre* | 13.02 | 14.65 | 14.35 | *16.34* | 12.75 | 13.40 | 15.45 | 12.83 | 20.32 |
| *N* | 42,655 | 16,200 | 11,695 | 12,602 | 12,707 | 31,549 | 11,106 | 37,966 | 4,689 |

This table reports OLS estimation of running equation (3) conditional firm financial status. Reported p-values are based on two-tailed tests. All the variables are defined in Appendix.

Table 4: Multivariate Analysis –Accounting Conservatism and Future Performance

$$X_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 R_{i,,t} + \beta_3 D_{i,t} * R_{i,t} + \beta_4 \Delta Perform_{i,t+1} + \beta_5 \Delta Perform_{i,t+1} * D_{i,t} + \beta_6 \Delta Perform_{i,t+1} * R_{i,,t} + \beta_7 \Delta Perform_{i,t+1} * D_{i,t} * R_{i,t} + \beta_i Control\ Variables + u_t + v_j + e_{i,t}$$

Panel A: *Δperform = ΔROA*

| | *Payout* | | *Size* | | *Bond Rating* | | *Paper Rating* | |
|---|---|---|---|---|---|---|---|---|
| | Constr. | Uncon. | Constr. | Uncon | Constr. | Uncon | Constr. | Uncon. |
| *Intercept* | 0.048 | 0.072 | 0.038 | 0.048 | 0.055 | 0.054 | 0.059 | 0.072 |
| | *0.004* | *0.000* | *0.102* | *0.001* | *0.000* | *0.002* | *<.0001* | *0.000* |
| *D* | -0.078 | -0.019 | -0.002 | 0.001 | -0.020 | 0.023 | -0.017 | 0.021 |
| | *0.376* | *0.007* | *0.903* | *0.932* | *0.000* | *0.209* | *0.000* | *0.204* |
| *R* | 0.058 | 0.040 | 0.049 | 0.087 | 0.042 | 0.063 | 0.050 | 0.074 |
| | *<.0001* | *<.0001* | *<..000* | *<.0001* | *<.0001* | *0.046* | *<.0001* | *0.108* |
| *R * D* | 0.014 | 0.019 | 0.053 | -0.034 | 0.027 | 0.078 | 0.020 | -0.068 |
| | *0.556* | *0.517* | *0.042* | *0.635* | *0.137* | *0.335* | *0.221* | *0.385* |
| *ΔPerformance* | -0.057 | -0.556 | -0.025 | -0.089 | -0.038 | -0.091 | -0.038 | -0.016 |
| | *0.018* | *<.0001* | *0.021* | *0.001* | *0.004* | *0.046* | *0.003* | *0.499* |
| *ΔPerformance * D* | -0.027 | -0.002 | -0.052 | 0.026 | -0.018 | -0.082 | -0.025 | -0.048 |
| | *0.968* | *0.948* | *0.053* | *0.585* | *0.336* | *0.839* | *0.162* | *0.243* |
| ***ΔPerform * R*** | **0.017** | **-0.017** | **0.007** | **-0.029** | **0.017** | **-0.082** | **0.011** | **-0.054** |
| | ***0.115*** | ***0.185*** | ***0.237*** | ***0.033*** | ***0.062*** | ***0.042*** | ***0.071*** | ***0.311*** |
| ***ΔPerform * R * D*** | **-0.082** | **0.038** | **-0.062** | **0.086** | **-0.052** | **-0.175** | **-0.038** | **0.139** |
| | ***0.043*** | ***0.057*** | ***0.061*** | ***0.160*** | ***0.049*** | ***0.087*** | ***0.110*** | ***0.134*** |
| *Control Variables* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Industry & Year Dummy* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Adjusted R-squre* | 14.26 | 14.78 | *15484* | 13.57 | 14.40 | 15.58 | 13.03 | 21.02 |
| *N* | 13,141 | 9,924 | 10,500 | 10,501 | 25,896 | 9,362 | 31,126 | 3,948 |

Panel B: *Δperform = ΔCFO*

| | *Payout* | | *Size* | | *Bond Rating* | | *Paper Rating* | |
|---|---|---|---|---|---|---|---|---|
| | Constr. | Uncon. | Constr. | Uncon | Constr. | Uncon | Constr. | Uncon. |
| *Intercept* | 0.048 | 0.072 | 0.039 | 0.047 | 0.054 | 0.055 | 0.058 | 0.071 |
| | *0.003* | *0.000* | *0.087* | *0.001* | *0.000* | *0.002* | *<.0001* | *0.000* |
| *D* | -0.009 | -0.021 | -0.004 | -0.001 | -0.018 | 0.021 | -0.016 | 0.020 |
| | *0.315* | *0.003* | *0.748* | *0.944* | *0.000* | *0.253* | *0.002* | *0.228* |
| *R* | 0.060 | 0.040 | 0.051 | 0.086 | 0.042 | 0.052 | 0.050 | 0.074 |
| | *<.0001* | *<.0001* | *<..000* | *0.000* | *<.0001* | *0.115* | *<.0001* | *0.105* |
| *R * D* | 0.010 | 0.020 | 0.042 | -0.086 | 0.023 | -0.041 | 0.013 | -0.083 |
| | *0.692* | *0.520* | *0.203* | *0.203* | *0.217* | *0.958* | *0.421* | *0.294* |
| *ΔPerformance* | -0.051 | -0.056 | -0.035 | -3.214 | -0.049 | -0.091 | -0.048 | -5.602 |
| | *0.018* | *0.102* | *0.028* | *0.025* | *0.002* | *0.046* | *0.003* | *0.011* |
| *ΔPerformance * D* | -0.002 | 0.052 | 0.005 | -1.224 | -0.011 | -0.082 | 0.010 | -3.280 |
| | *0.947* | *0.544* | *0.872* | *0.626* | *0.713* | *0.839* | *0.736* | *0.303* |
| ***ΔPerform * R*** | **0.019** | **-0.047** | **0.013** | **-4.065** | **0.019** | **-1.309** | **0.021** | **2.394** |
| | ***0.065*** | ***0.055*** | ***0.072*** | ***0.003*** | ***0.102*** | ***0.142*** | ***0.100*** | ***0.311*** |
| ***ΔPerform * R * D*** | **-0.121** | **0.098** | **-0.125** | **6.553** | **-0.044** | **-2.727** | **-0.048** | **-8.739** |
| | ***0.034*** | ***0.073*** | ***0.085*** | ***0.000*** | ***0.249*** | ***0.187*** | ***0.241*** | ***0.254*** |
| *Control Variables* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Industry & Year Dummy* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Adjusted R-squre* | 13.74 | 13.89 | *15.98* | 13.82 | 12.84 | 16.21 | 13.24 | 19.85 |
| *N* | 13,125 | 9,926 | 10,500 | 10,501 | 25,896 | 9,362 | 31,126 | 3,948 |

This table reports OLS estimations examining the relationship between accounting conservatism and firm future operating performance. Reported p-values are based on two-tailed tests. All the variables are defined in Appendix.

Table 5: SOX and Accounting Conservatism

$$X_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 R_{i,,t} + \beta_3 D_{i,t} * R_{i,t} + \beta_4 Post_{i,t+1} + \beta_5 Post_{i,t+1} * D_{i,t} + \beta_6 Post_{i,t+1} * R_{i,,t} + \beta_7 Post_{i,t+1} * D_{i,t} * R_{i,} + \beta_i Control\ Variables + v_j + e_{i,t}$$

| | Expected Sign | Coeff. | P -Value | Coeff | P-Value |
|---|---|---|---|---|---|
| *Intercept* | | 0.057 | *<.0001* | 0.028 | *0.085* |
| *D* | | -0.006 | *0.000* | -0.015 | *0.002* |
| *R* | | 0.022 | *<.0001* | 0.034 | *<.0001* |
| *R * D* | | 0.061 | *<.0001* | 0.101 | *<.0001* |
| *Post* | | -0.006 | *0.000* | -0.006 | *<.0001* |
| *Post * D* | | 0.003 | *0.401* | -0.001 | *0.672* |
| *Post * R* | - | -0.013 | *0.000* | -0.014 | *0.000* |
| *Post * R * D* | + | 0.039 | *0.005* | 0.037 | *0.003* |
| *Control Variables* | | No | | Yes | |
| *Industry Dummy* | | Yes | | Yes | |
| *Adjusted R-Square* | | 8.34 | | 10.57 | |
| *N* | | 42,655 | | 42,655 | |

This table reports estimation results running equation (4). Reported p-values are based on two-tailed tests. All the variables are defined in Appendix.

Table 6: SOX, Accounting Conservatism and Financial Constraints

$$Invest_{i,t+1} = \beta_0 + \beta_1\ Post + \beta_2\ FC + \beta_3\ Post * FC + \beta_4\ Q_{i,t} + \beta_5 R_{i,t} + \beta_6\ SaleGrth_{i,t} + \beta_7\ Cash_{i,t} + \beta_8\ Leverage_{i,t} + v_{i,t} + e_{i,t+1}$$

| | Expected Sign | Whole Sample | Payout | Size | Bond Rating | Paper Rating |
|---|---|---|---|---|---|---|
| *Intercept* | | 0.068<br>0.102 | -0.000<br>*0.949* | *0.009*<br>*0.157* | 0.009<br>*0.071* | *0.0083*<br>*0.093* |
| *Post* | - | -0.017<br><.0001 | -0.016<br><.0001 | *-0.017*<br>*<.0001* | -0.017<br><.0001 | *-0.017*<br>*<.0001* |
| *FC* | ? | | 0.013<br><.0001 | 0.005<br>*0.000* | 0.005<br><.0001 | 0.007<br>*<.0001* |
| ***Post * FC*** | - | | **-0.002**<br>**0.024** | ***-0.002***<br>***0.058*** | **-0.002**<br>**0.036** | ***-0.003***<br>***0.091*** |
| *Q* | + | 0.010<br><.0001 | 0.009<br>*<.0001* | *0.009*<br>*<.0001* | 0.010<br>*<.0001* | *0.010*<br>*<.0001* |
| *R* | + | 0.011<br><.0001 | 0.011<br>*<.0001* | 0.011<br>*<.0001* | 0.011<br>*<.0001* | 0.011<br>*<.0001* |
| *SaleGrth* | + | 0.0001<br>0.086 | 0.0001<br>0.042 | *0.0001*<br>*0.055* | 0.0001<br>0.085 | *0.0001*<br>*0.082* |
| *Cash* | + | 0.015<br>0.011 | 0.019<br>0.002 | *0.015*<br>*0.025* | 0.014<br>0.017 | *0.014*<br>*0.010* |
| *Leverage* | - | -0.018<br><.0001 | -0.022<br><.0001 | *-0.019*<br><.0001 | -0.014<br><.0001 | *-0.018*<br><.0001 |
| *Industry Dummy* | | Yes | Yes | Yes | Yes | Yes |
| *Adjusted R-Square* | | 28.34 | 30.57 | 30.05 | 30.86 | 30.42 |
| *N* | | 46,255 | 27,895 | 25,309 | 42,655 | 42,655 |

This table provides the OLS estimation results examining firm investment behavior pre and post Sox. Reported p-values are based on two-tailed tests. All the variables are defined in Appendix.

Table 7: Relationship between accounting conservatism and firm investment around SOX for financially constrained firms

$$X_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 R_{i,,t} + \beta_3 D_{i,t} * R_{i,t} + \beta_4 RInvest_{i,t+1} + \beta_5 RInvest_{i,t+1} * D_{i,t} + \beta_6 RInvest_{i,t+1} * R_{i,,t} + \beta_7 RInvest_{i,t+1} * D_{i,t} * R_{i,t} + \beta_i Control\ Variables + u_t + v_j + e_{i,t}$$

| | *Whole Sample* | | *Payout* | | *Size* | | *Bond Rating* | | *PaperRating* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| *Intercept* | 0.045 | 0.038 | 0.031 | 0.027 | -0.077 | -0.106 | 0.065 | 0.064 | -0.007 | -0.012 |
| | *0.001* | *0.065* | *0.104* | *0.274* | *0.025* | *0.000* | *<.0001* | *0.008* | *0.623* | *0.578* |
| *D* | -0.015 | 0.006 | -0.017 | 0.019 | 0.014 | -0.039 | -0.019 | -0.012 | -0.015 | -0.004 |
| | *0.006* | *0.598* | *0.064* | *0.418* | *0.452* | *0.459* | *0.004* | *0.493* | *0.015* | *0.838* |
| *R* | 0.045 | 0.041 | 0.049 | 0.039 | 0.057 | 0.052 | 0.034 | 0.067 | 0.037 | 0.033 |
| | *<.0001* | *0.002* | *0.000* | *0.121* | *0.000* | *0.112* | *0.004* | *0.001* | *0.000* | *0.033* |
| *R * D* | 0.032 | 0.083 | 0.025 | 0.150 | 0.108 | 0.148 | 0.040 | -0.052 | 0.102 | 0.199 |
| | *0.023* | *0.077* | *0.322* | *0.065* | *0.0.14* | *0.301* | *0.101* | *0.515* | *0.000* | *0.002* |
| *RInvest* | 0.123 | 0.094 | 0.140 | 0.076 | 0.098 | 0.058 | 0.141 | 0.134 | 0.155 | *0.087* |
| | *<.0001* | *0.015* | *<.0001* | *0.247* | *0.008* | *0.369* | *<.0001* | *0.098* | *0.000* | *0.030* |
| *RInvest * D* | 0.012 | 0.051 | 0.034 | 0.048 | 0.046 | -0.272 | -0.017 | 0.071 | 0.008 | -0.071 |
| | *0.602* | *0.472* | *0.339* | *0.682* | *0.392* | *0.094* | *0.742* | *0.589* | *0.798* | *0.416* |
| ***RInvest * R*** | **0.041** | **0.124** | **0.043** | **0.173** | **0.076** | **0.097** | **0.104** | **0.082** | **0.062** | **0.103** |
| | ***0.054*** | ***0.021*** | ***0.112*** | ***0.002*** | ***0.102*** | ***0.092*** | ***0.004*** | ***0.051*** | ***0.084*** | ***0.056*** |
| ***RInvest * R * D*** | **-0.172** | **-0.338** | **-0.049** | **-0.467** | **-0.206** | **-1.132** | **-0.131** | **-0.296** | **-0.221** | **-0.652** |
| | ***0.018*** | ***0.062*** | ***0.312*** | ***0.041*** | ***0.082*** | ***0.002*** | ***0.182*** | ***0.091*** | ***0.022*** | ***0.005*** |
| *Control Variables* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Industry & Year Dummy* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Adjusted R-squre* | 14.19 | 16.18 | 11.78 | 11.90 | 13.92 | 14.59 | 13.89 | 14.27 | 13.30 | 14.82 |
| *N* | 35,262 | 7,393 | 12,932 | 2,368 | 26,369 | 5,180 | 26,359 | 5,187 | 29,883 | 7,083 |

This table reports OLS estimation results of running equation (3) separately for pre and post SOX for financially constrained firms. Reported p-values are based on two-tailed tests. All the variables are defined in Appendix.

Table 8: Cross sectional tests –accounting conservatism and firm investments

$$X_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 R_{i,,t} + \beta_3 D_{i,t} * R_{i,t} + \beta_4 RInvest_{i,t+1} + \beta_5 RInvest_{i,t+1} * D_{i,t} + \beta_6 RInvest_{i,t+1} * R_{i,,t} + \beta_7 RInvest_{i,t+1} * D_{i,t} * R_{i,t} + \beta_8 Leverage_{i,t} + \beta_i Control\ Variables + u_t + v_j + e_{i,t}$$

| | *Horizon* | | *RetVol* | | *CEO_Own* | |
|---|---|---|---|---|---|---|
| | Short | Long | High | Low | Low | High |
| *Intercept* | 0.055 | 0.058 | 0.035 | 0.042 | 0.038 | 0.037 |
| | *0.264* | *0.237* | *0.116* | *0.001* | *0.101* | *0.085* |
| *D* | 0.054 | 0.017 | 0.007 | -0.017 | -0.089 | 0.034 |
| | *0.174* | *0.550* | *0.972* | *0.063* | *0.063* | *0.365* |
| *R* | -0.046 | 0.028 | 0.052 | 0.057 | -0.092 | 0.066 |
| | *0.368* | *0.188* | *<.0001* | *<.0001* | *0.006* | *0.275* |
| *R * D* | -0.012 | 0.055 | 0.067 | 0.018 | 0.320 | 0.113 |
| | *0.932* | *0.485* | *0.006* | *0.642* | *0.003* | *0.274* |
| *RInvest* | 0.311 | 0.134 | 0.163 | 0.106 | 0.142 | 0.062 |
| | *0.132* | *0.317* | *0.000* | *0.000* | *0.006* | *0.185* |
| *RInvest * D* | 0.431 | -0.108 | 0.029 | 0.032 | 0.094 | -0.015 |
| | *0.247* | *0.710* | *0.552* | *0.382* | *0.466* | *0.891* |
| ***RInvest * R*** | **0.057** | **0.069** | **0.051** | **0.027** | **0.315** | **0.176** |
| | ***0.432*** | ***0.204*** | ***0.034*** | ***0.315*** | ***0.032*** | ***0.024*** |
| ***RInvest * R * D*** | **-2.721** | **-1.562** | **-0.715** | **-0.214** | **-0.928** | **-0.243** |
| | ***0.032*** | ***0.125*** | ***0.038*** | ***0.117*** | ***0.001*** | ***0.375*** |
| *Control Variables* | Yes | Yes | Yes | Yes | Yes | Yes |
| *Industry & Year Dummy* | Yes | Yes | Yes | Yes | Yes | Yes |
| *Adjusted R-squre* | 29.35 | 27.80 | 17.20 | 15.87 | 25.34 | 27.23 |
| *N* | 909 | 1,776 | 13,947 | 13,948 | 2,280 | 2,258 |

This table reports estimation results of running equation (3) conditional on firm investment incentives for financially constrained firms measured by dividend payout ratio. Reported p-values are based on two-tailed tests. All the variables are defined in Appendix.