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# Corporate investment and changes in GAAP

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**Abstract** This paper investigates whether changes in Generally Accepted Accounting Principles (GAAP) affect corporate investment decisions. Using a sample containing forty nine changes in GAAP, I find that changes in accounting rules affect investment decisions. I then examine two mechanisms through which changes in GAAP affect investment. First, I find that changes in GAAP affect investment, particularly R&D expenditures, when firms have financial covenants that are affected by changes in GAAP. Second, I find evidence suggesting that the process of complying with some changes in GAAP alters managers' information sets and consequently changes their investment decisions, particularly their capital and R&D expenditures and, to a weaker extent, their acquistion expenditures. This paper contributes to the literature on the real effects of accounting by providing evidence that accounting rules affect investment decisions even when the rule change does not concern the measurement and reporting of investment, and by documenting specific mechanisms through which the relation manifests.

**Keywords** Investment · Capital expenditure · R&D · Acquisitions · GAAP · Managerial learning · Financial reporting · Earnings quality · Covenants · Financing constraints

**JEL Classification** D9 · G30 · G31 · M40 · M41

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## 1 Introduction

In this paper, I investigate whether changes in Generally Accepted Accounting Principles (GAAP) affect an important managerial decision: corporate investment. A large body of prior research finds that changes in the way in which a transaction or economic activity is measured and recorded in financial statements lead to changes in that specific transaction or economic activity [e.g., Horwitz and Kolodny (1980) find that the change in the accounting for research and development (R&D) leads to changes in R&D investment; Mittelstaedt et al. (1995) find that the change in accounting for postretirement benefits leads to changes in the postretirement benefits offered to employees]. However, there is limited research that examines whether changes in accounting rules affect investment decisions when the accounting change does not affect the financial reporting of investment activities. I hypothesize that changes in GAAP (unrelated to the accounting for investment) can affect investment decisions for at least two reasons.

First, I hypothesize that changes in GAAP affect investment decisions because the numbers reported in financial statements often have a direct bearing on contractual outcomes (Watts and Zimmerman 1986; henceforth, the "contracting hypothesis"). For example, debt contracts typically contain covenants based on numbers reported in financial statements (Leftwich 1983). Thus, if a change in GAAP has an unfavorable (favorable) impact on current and future financial statements, and if debt covenants are not adjusted to incorporate the changes, the change in GAAP will likely tighten (loosen) covenant slack. As a result, managers may alter their actions to avoid covenant violation, especially if the covenants are binding. Specifically, since most investments have an uncertain future outcome and some positive probability that the outcome is a loss, they increase the probability of violating covenants in the future by adversely impacting future financial ratios. Consequently, managers might respond to changes in GAAP that adversely affect financial statements by cutting investment in risky assets, with the goal of preserving net worth and preventing deterioration of financial ratios.

Second, I propose that some changes in GAAP require managers to collect and process additional information to comply with the new rule, which changes their information set and subsequent decisions (henceforth, the "information hypothesis"). One of the primary objectives of GAAP is to provide investors with information about firms' future cash flows to facilitate their investment decisions (Statement of Financial Accounting Concepts No. 1). Managers, like investors, evaluate investment opportunities by forecasting and discounting the expected future cash flows from investments (Graham and Harvey 2001). Therefore, preparing financial accounting statements for external investors can have a spillover effect on managers' information sets by requiring managers to assimilate information to comply with GAAP. Although managers have access to more detailed and timely information than what is reported in financial statements, they have limited attention and are unlikely to process all the information available

within the firm (Simon 1973).[1] Further, prior research finds that the management accounting systems that are used for internal decision making are closely linked to the financial accounting systems that are used for external reporting (Kaplan 1984; Zimmerman 2009; Dichev et al. 2013). Consequently, the implementation of a new accounting rule can lead firms to collect and process additional information, which can incrementally inform managers about the future cash flow consequences of their decisions. For example, Singh (2001) quoted Ben Neuhausen, a partner in Arthur Andersen's professional standards group, as saying,

> I think some companies were genuinely clueless about how much these benefits were going to cost them over the long haul…once Statement 106 [postretirement benefits] forced them to measure these obligations, a lot of companies realized that they had offered benefits they could not afford.

More recently, Shumsky (2016) suggests that complying with the new accounting rule for leases will lead companies to collect new data that can improve decision making. Specifically, she states that

> most large companies are party to thousands of leases. Yet, few of these are tracked by top decision makers like chief financial officers and financial controllers. This is changing. Starting in 2019, public companies will have to report obligations and assets tied to lease agreements…"visibility into companies' lease portfolios will enable companies and CFOs to start making potentially different decisions and cut costs potentially across the organization," said Sheri Wyatt, managing director at PwC's capital markets and accounting advisory practice.

I hypothesize that changes in GAAP that inform managers that they overestimated (underestimated) the future cash flows and net present values (NPV) of their investment decisions, cause managers to decrease (increase) investment. For example, if the adoption of SFAS 106 (postretirement benefits) informed managers that they underestimated the cost of employees, this information is likely to cause a downward revision in NPV estimates of projects, turning some previously positive NPV projects into negative NPV projects. Any such revision in NPV estimates is likely to decrease investment.

I test whether changes in GAAP affect investment using a sample containing 49 mandatory accounting rule changes implemented between 1991 and 2007. An innovation of my setting is that I use multiple accounting changes spread over 17 years, which has two advantages: (1) the inferences have greater external validity because they span multiple accounting changes and thus are unlikely to be explained by idiosyncratic attributes of any individual standard, and (2) I can exploit the heterogeneity in the characteristics of different accounting changes to develop unique tests of my hypotheses. I measure investment as capital expenditure (Capex), R&D, acquisition expenditures, and the sum of these (total investment). I use the

[1] Simon (1973, p. 270) argues that "the scarce resource is not information; it is processing capacity to attend to information. Attention is the chief bottleneck…and the bottleneck becomes narrower…as we move to the tops of organizations."

cumulative effect of an accounting change to measure the impact an accounting rule change has on firms' earnings and book equity. The cumulative effect of an accounting change is a one-time, noncash, below-the-line charge reflecting the "catch-up" effect from adopting the new accounting rule. The cumulative effect captures (1) the difference between the old and new accounting practice, and (2) the degree to which a firm uses the economic transaction for which the accounting changed. Thus, the cumulative effect captures both the *magnitude* and *sign* of the impact an accounting change has on firms' financial statements. Importantly, the cumulative effect serves as a proxy for the impact of an accounting change on firms' financial statements that can be compared across multiple different standards.

I predict that the cumulative effect is positively related to investment under both the contracting and information hypotheses. For example, negative cumulative effects reduce net income and net assets, which increases the probability of violating covenants (e.g., the net worth covenant). In addition, negative cumulative effects may inform managers that they previously overestimated profits and cause them to revise NPV estimates downward. In either case, negative cumulative effects are likely to decrease investment. Consistent with the above prediction, I find that the cumulative effect of an accounting change is positively related to Capex, R&D, acquisition expenditures, and total investment. The coefficient estimates suggest that a one standard deviation increase in the cumulative effect (=6.4% of assets) leads to a 2.4% (4.3; 7.6; 1.6%) increase in Capex (R&D; acquisitions; total investment) from its mean. This result is robust to controlling for accounting standard fixed effects, potential measurement error in Tobin's Q (Erickson and Whited 2000), and a number of control variables. Further, my inferences are robust to measuring investment in "changes" rather than "levels" and dropping accounting changes that allow firms discretion with respect to the adoption method. These results provide initial support for my primary hypothesis that changes in GAAP affect corporate investment decisions.

Next, I conduct several tests to examine the specific mechanisms through which changes in GAAP affect investment. I begin by examining whether the use of GAAP numbers in debt contracts induces a relation between changes in GAAP and investment. The contracting hypothesis suggests that accounting changes affect covenant slack, which in turn affects investment decisions. To test this hypothesis, I exploit the fact that debt contracts differ in terms of whether they allow changes in GAAP to affect contract provisions. Specifically, some debt contracts "fix GAAP" at inception and contain explicit provisions to prevent changes in GAAP from affecting contract terms, while other debt contracts use a "floating GAAP" approach and allow changes in GAAP to affect contract terms. Thus, changes in GAAP affect covenant slack only when the contract is based on floating GAAP. I use variation in this contract characteristic (i.e., fixed or floating GAAP) as well as variation in the presence of financial covenants in the contract to examine whether the use of GAAP in debt contracts induces a relation between changes in GAAP and investment.

I find that changes in GAAP have a larger effect on investment when debt contracts have covenants that are affected by changes in GAAP (i.e., when contracts are based on floating GAAP), relative to when debt contracts *explicitly disallow*

accounting changes from influencing the computation of covenants (i.e., contracts based on fixed GAAP). This result suggests that changes in GAAP affect investment via contracts. Further, I find that this result is statistically stronger for investments in R&D relative to Capex and acquisitions. Given that investments in R&D are immediately expensed and thus have an immediate and direct impact on financial statements and debt covenants (unlike Capex and acquisitions), it is not surprising that managers are more likely to cut R&D than other investments in response to a change in GAAP that reduces covenant slack. To further examine the contracting hypothesis, I also test and find that changes in GAAP have a stronger effect on investment when a company is financially constrained and thus has fewer outside opportunities to refinance/renegotiate its debt.

In the above tests, I find that changes in GAAP are associated with investment even in the absence of financial covenants, suggesting that debt contracts are not the only reason why changes in GAAP affect investment. To explore further, I devise a test of the information hypothesis. Specifically, I exploit the variation in the nature of the changes in GAAP and classify them into two groups based on their likelihood of requiring managers to collect and process additional information. For example, SFAS 123R (expensing stock options) required firms to *recognize* the cost of employee stock options in earnings. Since such information was already disclosed in financial statements (due to SFAS 123), compliance with SFAS 123R is less likely to affect managers' information sets. In contrast, compliance with standards such as SFAS 106 (postretirement benefits) and SFAS 143 (asset retirement obligation) is more likely to affect managers' information sets because they required managers to collect and process significant amounts of additional information, which was not required previously.[2] The information hypothesis suggests that changes in GAAP that are likely to inform managers have a larger effect on investment than changes in GAAP that are less likely to inform managers. Consistent with this prediction, I find that the coefficient on the cumulative effect is significantly larger when the change in GAAP is likely to inform managers for investments in Capex and R&D but not acquisitions. The weaker evidence that changes in GAAP inform firms' acquisition decisions is perhaps because acquisition decisions are relatively more dependent on the value of the *target* and less likely to be affected information about the *acquirer's* costs and revenues.

To further investigate the contracting and information hypotheses, I examine whether the effect of changes in GAAP on investment persists into the future. Since debt contracts are frequently renegotiated (e.g., Roberts and Sufi 2009), the effect of changes in GAAP on investment via the contracting channel is unlikely to persist into the future. In contrast, any new information learned from complying with an accounting rule change is likely to have a persistent effect on investment. Consistent with the above intuition, I find that changes in GAAP affect investment in the post-adoption years via the information channel but not via the contracting channel, thereby providing further evidence consistent with my with hypotheses.

[2] The classification of a change in GAAP as more or less likely to inform managers is based on a manual coding procedure discussed in Sect. 4. I discuss the rationale for each of my classification choices in "Appendix 1" and a validation test for the classification in "Appendix 2".

Thus far my tests rely on the cumulative effect of an accounting change being a valid measure to capture the impact of accounting changes on firms' financial statements. To mitigate concerns about potential measurement error in this proxy, I conduct an additional test that does not utilize the cumulative effect. Specifically, I examine whether the adoption of SFAS 106 (postretirement benefits) led firms to reduce investment. The benefit of focusing on SFAS 106 is that (1) it affected a broad cross-section of firms, (2) there is fairly robust anecdotal evidence that firms underestimated postretirement benefit costs prior to SFAS 106 adoption, such that compliance with this standard is expected to reduce investment per my hypothesis, and (3) I can measure cross-sectional differences in the impact of this accounting change using the magnitude of the postretirement benefit obligation.

To test whether SFAS 106 affects investment decisions while controlling for the concurrent changes in economic conditions and investment opportunities, I use a differences-in-differences design that exploits the staggered nature of SFAS 106 adoption resulting from differences in firms' fiscal year ends as well as some early adoption of the standard. Consistent with my prediction, I find that firms reduce their capital and R&D investment post-SFAS 106 adoption and that the reduction in investment is larger for firms that had larger postretirement benefit obligations. Further, the data show that the effect of SFAS 106 on investment persists for many years post adoption, which is consistent with the information hypothesis but not necessarily with alternative hypotheses related to changes in investment opportunities. Finally, I find that SFAS 106 adoption does not affect acquisition expenditures. I interpret this result as suggesting that the new information learned from complying with SFAS 106 does not affect acquisition decisions because they are more dependent on the valuation of the target firm (rather than the acquirer). This result is consistent with the evidence discussed earlier that the information hypothesis is less applicable for acquisition decisions.

This paper makes the following contributions. First, this paper contributes to the literature examining the relation between accounting changes and economic behavior. Specifically, many prior studies show that changes in the accounting rules for a transaction (e.g., R&D) have real effects on that particular transaction (i.e., R&D) for which the accounting changed. This paper extends this line of inquiry by providing evidence that accounting rules have an impact on investment decisions even when the rule change is unrelated to the measurement and financial reporting of investment.

Second, this paper contributes to the emerging and growing literature on the relation between financial accounting and investment. One line of inquiry shows that financial reporting considerations and earnings management incentives affect investment decisions—i.e., firms' investment decisions are affected by their incentives to report higher earnings (e.g., Bushee 1998; Bens et al. 2002; Graham et al. 2005; Graham et al. 2011). Another strand of research examines whether disclosure quality facilitates more efficient investment by (1) reducing agency problems (Biddle et al. 2009; Balakrishnan et al. 2014, 2016; Shroff 2015), (2) informing managers of the disclosing firms and peer firms (McNichols and Stubben 2008; Badertscher et al. 2013; Shroff et al. 2014), and (3) serving as a signal of managers' forecasting ability (Goodman et al. 2014). I add to this line of research by

studying the link between accounting and investment around the adoption of multiple new standards and by providing evidence of two mechanisms through which this relation manifests.

Finally, I use insights from the psychology literature to develop a new hypothesis suggesting that the process of complying with certain mandatory changes in financial reporting can alter managers' information sets and consequently their investment decisions. The psychology literature argues that managers have limited attention and thus might not fully incorporate all information available within the firm in their decisions [see Camerer and Malmendier (2007) and DellaVigna (2009) for reviews of the literature]. An implication of having limited attention is that managers use a single set of rules to measure performance for external reporting (i.e., financial accounting) and for internal decision making (i.e., managerial accounting) (Kaplan 1984; Zimmerman 2009; Dichev et al. 2013). As a result, changes in external reporting rules can lead to changes in managers' information sets and thus affect their corporate decisions. I provide initial empirical evidence consistent with this hypothesis but caution that this hypothesis is in its infancy and requires further testing to establish its descriptive validity. Cheng et al. (2014) take a step in this direction.

## 2 Prior research and hypotheses development

### 2.1 Prior research on the relation between accounting changes and corporate decisions

A number of prior studies examine whether firms change their behavior in response to changes in GAAP. The vast majority of the studies examining the economic consequences of changes in GAAP focus on a single accounting change and show that the change in accounting for an economic activity affects that specific economic activity in the future. For example, Amir et al. (2010) show that firms shift pension assets from equities to bonds after SFAS 158 required firms to recognize the pension-funding status in the balance sheet. Zhang (2009) finds that firms cut their speculative use of derivative instruments after SFAS 133 required recognition of all derivatives as either assets or liabilities at fair value. Choudhary et al. (2008) find that firms accelerate the vesting of employee stock options to avoid recognizing unvested option grants at fair value under SFAS 123R. Hodder et al. (2002) show that the implementation of SFAS 115, which requires certain debt and equity investment securities to be fair-valued, led banks to change the size and composition of their investment securities portfolios. Mittelstaedt et al. (1995) document a reduction in retiree healthcare benefits after SFAS 106 changed the accounting for postretirement benefits. As for studies more focused on accounting changes and investment, Bens and Monahan (2008) provide evidence that firms cut investments in variable interest entities once FIN 46 required then to consolidate variable interest entities in their financial statements, and Horwitz and Kolodny (1980) find

that firms reduce R&D activity in response to SFAS 2, which required firms to expense R&D costs.[3]

A common theme among prior studies that examine the real effects of changes in GAAP is whether accounting for a specific economic transaction (e.g., retirement benefits) affects the future use of that economic transaction (e.g., providing employees retirement benefits). This paper differs from prior studies by examining whether changes in GAAP have a more general effect on Capex, R&D, and acquisition decisions even when the accounting rules for these investments remain constant. This examination broadens the economic implications of changes in accounting rules beyond the direct effect of the accounting change.

### 2.2 Background for contracting hypothesis

Accounting numbers prepared under GAAP serve as a foundation for contracting on accounting information (Leftwich 1983). As a result, changes in GAAP can affect real decisions through their effect on contractual outcomes as long as there are transaction costs to altering contract terms (Holthausen and Leftwich 1983; Watts and Zimmerman 1986). In other words, if it is costless to undo the effect of accounting change on contracts, then changes in GAAP should not affect managers' real decisions via their effect on contracts. For example, it is conceivable that some firms write contracts on the basis of pro-forma financial statements or specifically state in the contract that accounting changes will not affect the contractual outcomes (i.e., use "fixed" GAAP). However, writing contacts to accommodate changes in GAAP is quite challenging in practice, as Ball et al. (2015) discuss. Specifically, if a firm chooses to use fixed GAAP, it incurs the cost of keeping parallel books and might even have to have both sets of books audited. If borrowers have outstanding debt issued at different dates—each under a different set of accounting standards—then the costs of maintaining multiple sets of books can escalate quickly. Consistent with the arguments that writing and adjusting contracts to accommodate changes in GAAP are costly, Ball et al. (2015) find that mandatory IFRS adoption led to a significant drop in the use of accounting covenants in debt contracts because IFRS entails frequent rule changes as well as significant uncertainty about future rule changes. Their evidence speaks to the potential difficulty in altering contract terms to accommodate (frequent) accounting rule changes.[4] In a scenario where adjusting contract terms in response to changes in GAAP is costly, a change in GAAP can affect managers' real decisions, including their investment decisions.

[3] Other examples of such studies include Dukes et al. (1980), Imhoff and Thomas (1988), and Chuk (2013), among others.

[4] In contrast to Ball et al. (2015), Demerjian et al. (2016) find that lenders modify contractual definitions after the adoption of SFAS 159 (Fair Value Option) but continue to use GAAP-based accounting covenants. However, Demerjian et al. (2016) do not examine how existing debt contracts, written based on pre-SFAS 159 GAAP, were affected by the implementation of the new accounting rule.

### 2.3 Background for the information hypothesis

One of the primary purposes of financial reporting is to provide investors with information about firms' future cash flows. Since managers make capital allocation decisions by forecasting and discounting future cash flows from corporate investments (Graham and Harvey 2001), a potential byproduct of producing financial accounting statements and assimilating information to comply with GAAP is that the *compliance process* can affect managers' information sets. While managers have virtually unconstrained access to information within the firm on a more timely basis than that reported in financial statements, theories of costly information acquisition and processing suggest that managers have limited information processing capacities and are unlikely to be cognizant of all the information relevant for decision making (Simon 1973; Smith and Warner 1979; Sims 2003; DellaVigna 2009). Consequently, compliance with a new accounting rule that was proposed to enhance the ability of investors to forecast a firm's future cash flows may incrementally inform managers of that firm about the future cash flow consequences of their actions by forcing them to collect and process previously unprocessed data.

Consider the following examples: SFAS 106 required firms to switch from a cash basis of accounting for postretirement benefits to an accrual basis. The change required firms to compute the expected future cash outflows towards retirement benefits, which require estimates of future health care costs, expected lifespan of employees post retirement, expected retirement age, discount rates, and expected return on retirement plan assets, among other things. To the extent firms simply used current cash outflows as a proxy for expected future cash outflows towards retirement benefits (as anecdotal evidence suggests), they would have underestimated the true cost of postretirement benefits, and compliance with SFAS 106 would have provided firms with information about this cost. The same argument applies for SFAS 112, which required firms to accrue the expected cost of postemployment benefits.

Also consider SFAS 143 and FIN 47, which required firms to accrue the expected cost associated with the legal obligation to remove tangible long-lived assets such as property and equipment. Inherent in the calculation of the obligation are numerous assumptions and judgments, including the estimated life of the property to be retired, settlement amounts, inflation factors, discount rates, timing of settlement, and changes in the legal, regulatory, and environmental landscapes. Therefore, the cost of obtaining an accurate estimate of the retirement obligation is likely to be nontrivial. To the extent firms failed to fully factor these costs into their investment decisions, complying with SFAS 143 and FIN 47 is likely to have provided managers with incremental information relevant for their investment decisions.

Although I do not observe whether firms accurately calculate the cost of postretirement benefits, postemployment benefits, and asset retirement, etc., and incorporate them into their investment decisions before adopting the respective accounting standard, anecdotal evidence suggests that at least some firms were not collecting the information necessary to estimate these costs before the accounting

rule change.[5] In addition, compliance with these standards often requires firms to hire outside experts (e.g., actuaries, appraisers, etc.) to help managers estimate accruals and evaluate the value of assets/liabilities (Reason 2003). Such an action suggests that firms may not have had the expertise to comply with the accounting change, and that the changes in GAAP, by requiring firms to hire outside experts, improved the quality of information available to managers to make their decisions.

Anecdotal and survey evidence also show that financial accounting rules affect management information systems—the premier source of information for managerial decision making.[6] Conventional wisdom claims that managerial and financial accounting are fundamentally different entities since they cater to different audiences. However, Zimmerman (2009, p. 7) argues that using different systems for managerial decision making and external reporting can be costly because managers have limited information-processing capacities and the different systems can create disorder by reporting different numbers for the same concept. Dichev et al. (2013) survey managers and find that over 80% of their sample firms indicate that there is "a tight link between internal and external reporting" (p. 10). In such a scenario, changes in financial reporting rules are likely to affect internal information systems and thus provide managers with new information, which affects their investment decisions.[7]

### 2.4 Hypothesis development

I conjecture that changes in GAAP that have a negative (positive) impact on current and future financial statements are likely to have at least two effects. First, they increase the probability of having a negative (positive) contracting outcome, and managers respond to such changes in GAAP by cutting investment in risky assets with the goal of preventing further deterioration of financial ratios in the future. Second, complying with a new GAAP promulgation might incrementally inform managers that they overestimated (underestimated) the NPV of their investments.[8] Such changes are likely to be followed by a decrease (increase) in investment.

[5] For example, a *Business Week* article entitled "First Thing We Do Is Kill the Accountants" quotes FASB project manager Diana J. Scott as saying, "We are absolutely appalled. They [employers] honestly weren't measuring this [healthcare benefits]. In some cases they didn't even know whom they were covering as dependents. Employers are finding they promised much more than they can give" (September 12, 1988, p. 4). See "Appendix 1" for additional examples.

[6] See e.g., Kaplan (1984), Johnson and Kaplan (1987), Hopper et al. (1992), Drury and Tayles (1997), and Ball (2004). Hemmer and Labro (2008) provide analytical evidence that changes in GAAP affect management accounting systems.

[7] Note that the information hypothesis does not assume that managers are acting sub-optimally. It is conceivable that managers rationally choose not to process certain data because the expected benefits of doing so are lower than the expected costs. However, when a change in GAAP forces managers to process additional information, we might observe a change in their behavior because of the spillover effects from complying with the new accounting rule.

[8] Computing NPV requires estimates of the project's future cash flows and cost of capital. I remain agnostic as to whether the information learned by managers is about future cash flows or the project's cost of capital.

I use the cumulative effect of an accounting change to measure the impact of an accounting change on firms' earnings and book equity. The cumulative effect captures not only the difference between the old and new accounting practice, but also the degree to which a firm uses the economic transaction for which the accounting changed. As a result, cumulative effect captures both the magnitude and sign of the impact an accounting change has on firms' financial statements, and I expect it to be positively related to investment. The above discussion leads to my first hypothesis.

**H1:** The cumulative effects of accounting changes are positively associated with firms' investment.

Next, I hypothesize that changes in GAAP affect corporate investment decisions by altering the probability of violating financial covenants in debt contracts. Financial covenants in private debt agreements provide a good setting in which to examine the effects of changes in GAAP on investment because of their ubiquity and because covenants are generally defined in terms of modified versions of GAAP (Smith and Warner 1979; Leftwich 1983). Further, since the covenants in private credit agreements are tightly set, even small changes in financial ratios are likely to affect firm behavior (Kahan and Tuckman 1993; Verde 1999; Dichev and Skinner 2002). Finally, prior research finds that covenant violation is costly for the borrowing firm (e.g., Chava and Roberts 2008). Therefore, when a change in GAAP pushes firms closer to (away from) covenant violation, firms are likely to respond by cutting (increasing) investment spending, provided covenants are not fully adjusted to undo the effect of the change in GAAP. Anecdotal evidence supports the arguments above. For example, a recent article in CFO.com discusses the impact of a proposed change in lease accounting on debt contracts.

> The boards [FASB and IASB] are now mulling new ways to proceed on lessee accounting. Whatever changes the boards do make, however, one thing is nearly certain: the assets and liabilities of what are now operating leases will henceforth be recorded on corporate balance sheets. No matter how the boards decide to make that happen, the current apple cart of the relations between companies and their lenders is bound to be upset, experts say. That's because the calculations of many of the key ratios governing bank covenants, such as earnings before interest, taxes, depreciation, and amortization (EBITDA), debt-to-equity (D/E) and return on assets (ROA), are bound to come out a whole lot differently for many companies.[9]

However, ex ante it is uncertain whether changes in the probability of covenant violation due to *mandatory* accounting changes will cause managers to alter investment. Financial covenants are generally put in place to monitor managers and prevent them from taking actions that transfer wealth from debt holders to equity holders (Tirole 2006). Since firms have no choice but to adopt mandatory changes in GAAP, debt holders could be more willing to renegotiate debt contracts to

[9] The full article can be viewed at: http://ww2.cfo.com/gaap-ifrs/2014/02/lease-accounting-changes-jar-bank-covenants/.

accommodate changes in GAAP. In fact, recent research suggests that contract renegotiation occurs frequently and should be thought of as the norm, not the exception (Roberts and Sufi 2009). Therefore, the costs of violating covenants due to mandatory accounting changes may not be large enough to warrant a change in investment if contracts can be renegotiated. That said, prior research also finds that the borrowing firm can face switching and hold-up costs once the contract is signed, which can increase renegotiation costs for the borrower (Hart and Moore 1988; Aghion and Bolton 1992; Rajan 1992). The above discussion leads to my next hypothesis.[10]

**H2:** The cumulative effects of accounting changes have a stronger association with firms' investment when the change in GAAP alters firms' financial covenants.

Finally, I hypothesize that some changes in GAAP affect investment by providing managers new information that is relevant for investment decision making. Changes in GAAP that increase the amount of accrual accounting estimates are more likely to inform managers because they may impose additional information-processing requirements on managers to arrive at reasonable accrual estimates. For example, compliance with standards such as SFAS 106 (postretirement benefits) and SFAS 142 (goodwill impairment) requires firms to make considerable judgments about future events and perhaps even seek expert help outside the firm to arrive at reasonable estimates of the expense/benefit and the value of the asset/liability (Reason 2003). Making informed estimates requires information which may not be readily available to managers. Therefore, such standards are more likely to inform managers. On the other hand, compliance with rules such as SFAS 123R (expensing stock options), SOP 98-5 (mandatory expensing of business startup costs), and SAB 101 (revenue recognition) is less likely to provide managers with decision-facilitating information. SAB 101, for example, increased verifiability requirements to recognize revenue, which primarily results in postponing revenue recognition until the higher verifiability threshold is met (Altamuro et al. 2005). Since managers are less likely to gain any information about the underlying cash flow stream from a higher verifiability threshold, this standard is less likely to inform managers. This discussion leads to my final hypothesis.

**H3:** The cumulative effects of accounting changes have a stronger association with firms' investment when the accounting change is more likely to inform managers about the profitability of current and/or future projects.

Although the above hypotheses suggest that changes in GAAP affect investment due to a mixture of debt contracting and managerial learning, there may be other

[10] Another reason why changes in GAAP might not affect investment via the contracting channel is because managers have other mechanisms through which they can alter contracting outcomes in the short run. For example, prior research suggests that managers manipulate accruals (Healy and Wahlen 1999), cash flows (Lee 2012), and day-to-day operations (Roychowdhury 2006; Cohen et al. 2010) to achieve the desired financial reporting outcomes. Given these alternatives, whether managers change long-term investment to lower the probability of an adverse accounting outcome and the resultant contracting outcome is an empirical question.

reasons why changes in GAAP can have real effects. For example, a potential third reason why changes in GAAP can affect investment is because other stakeholders (e.g., employees, customers, and suppliers) rely on certain key financial items/ratios, which either implicitly or explicitly (via contracts) requires managers to keep these financial items/ratios above a "threshold" similar to an explicit debt contract. My empirical tests try to parse out the debt-contracting and managerial-learning channels as potential reasons why changes in GAAP have real effects (as discussed below), but they do not preclude the idea that changes in GAAP affect investment via additional mechanisms.[11]

## 3 Investment model and sample selection

### 3.1 Investment model

A large body of investment literature (e.g., Fazzari et al. 1988; Kaplan and Zingales 1997; Rauh 2006; Chava and Roberts 2008) estimates linear equations of the form

$$INVESTMENT_{i,t} = \beta_0 + \beta_1 TOBIN'S\_Q_{i,t-1} + \beta_2 CFO_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable is the ratio of capital expenditures to assets, $TOBIN'S\_Q_{i,t-1}$ is represented by a market-to-book ratio of assets at the beginning-of-year $t$, and $CFO_{i,t}$ is a measure of cash flow. A linear relationship between investment and *TOBIN'S_Q* is derived from the $Q$ theory of investment pioneered by Tobin (1969) and further developed by Hayashi (1982). The key result from this literature is that investment is solely a function of $Q$ in a frictionless world. Fazzari et al. (1988) motivate the inclusion of cash flow in this specification by arguing that firms are financially constrained and thus the availability of funds affects investment. A positive coefficient on *CFO* rejects a frictionless model of investment and suggests the presence of financing constraints (see Hubbard 1998). However, prior studies raise a number of objections about the validity of the above investment model and the inferences drawn from differences in investment-cash flow sensitivity across firms/time. Most prominently, prior studies argue that measurement error in $Q$ significantly hinders the reliability of any inferences drawn using the above model, and suggest measurement error remedies to address the concern (Roberts and Whited 2013).

I examine the effect of changes in GAAP on corporate investment decisions by building on the neoclassical investment model (i.e., $Q$-theory model) described above. My primary prediction is that accounting changes incrementally affect investment decisions when other determinants of investment, such as investment opportunities and cash flows, are controlled for. This is because (1) accounting changes lead to changes in both income and book equity that affect contract terms such as net worth covenants, and (2) compliance with accounting changes can lead

[11] However, I concede that my tests cannot definitively separate out the information and debt contracting hypotheses from the hypothesis that the use of financial statement numbers by customers/suppliers affects manager behavior.

managers to collect/process additional information that affects their subsequent decisions. The neoclassical investment model assumes that (1) contracts are complete with respect to accounting rules (i.e., accounting changes do not create any contracting frictions), and (2) managers have complete information sets and do not have limited attention.[12] Therefore, accounting changes do not affect investment in the neoclassical investment model. My tests are based on the null hypothesis that the neoclassical model is correctly specified and go on to test the alternative hypothesis that accounting changes affect investment.

I use the cumulative effect of an accounting change as a proxy for the magnitude and sign of the impact an accounting change has on a firm's financial statements. The cumulative effect is a one-time, noncash, below-the-line item reflecting the prior-period or "'catch-up" effect of changing an accounting practice, which is recognized in the current period's income statement. This amount captures the difference between the old and new accounting rules and the extent to which each firm used the transaction (or economic activity) for which the accounting changed (e.g., firms that do not compensate their employees with stock options are unaffected by the adoption of SFAS 123R and thus have zero cumulative effects associated with this standard). Computationally, the cumulative effect of an accounting change is the difference between the owner's equity under the old accounting rules and the owner's equity after the change in GAAP.

There are a number of advantages of using the cumulative effect as the proxy for the impact of a change in GAAP on firms' financial statements for the purpose of my research question. First, the cumulative effect serves as a measure of the impact of an accounting change that can be compared across many different standards in a quantitative manner. Second, the cumulative effect captures the degree to which a firm uses the economic transaction for which the accounting changed and thus does not assume that all firms are equally affected by an accounting change, thereby creating within standard variation in the impact. Finally, the cumulative effect is especially meaningful for testing the contracting hypothesis because it has a one-to-one effect on some of the commonly used debt covenants (e.g., the net worth covenant, the tangible net worth covenant) that results from changes in GAAP rather than changes in firm performance. Thus, if an accounting change leads to a firm booking a ten million dollar charge as a cumulative effect, their net worth is that much closer to the covenant threshold and this decrease in covenant slack can be attributed to the accounting change rather than changes in economic factors.[13]

I add the cumulative effect to Eq. 1 as another explanatory variable and estimate regressions of the following form to test my predictions.

[12] Zuo (2016) provides evidence that managers do not have complete information when forecasting earnings.

[13] The argument for using the cumulative effect to capture whether changes in GAAP affect investment via the information hypothesis is more nuanced because the underlying construct of interest is the amount of information managers learn from complying with a new accounting rule. If managers rely on financial accounting numbers based on GAAP to measure certain costs (which I assume), then they are more likely to learn new information from complying with a change in GAAP that (1) concerns an economic transaction commonly used by them and (2) is more different than the previous one in place, both of which are captured by the cumulative effect.

$$INVESTMENT_{i,t} = \beta_0 + \beta_1 TOBIN'S\_Q_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CUMU\_EFF_{i,t} + \varepsilon_{i,t} \quad (2)$$

I measure *INVESTMENT* as either *CAPEX*, *R&D*, *ACQ* (acquisition expenditures) or the sum of the three investment proxies (*TOTAL INVEST*). *CFO* is cash flows from operations, and *CUMU_EFF* is the cumulative effect of an accounting change (see "Appendix 3" for variable definitions).

### 3.2 Sample selection

I begin my sample construction by identifying firm-years in the intersection of CRSP and Compustat with non-missing and nonzero values for the cumulative effect.[14] Both voluntary and mandatory accounting changes cause firms to book a cumulative effect, and including voluntary changes in my sample raises endogeneity concerns. To eliminate voluntary accounting changes, I hand-collect information from more than 5500 10-K filings corresponding to observations in Compustat that have a non-missing and nonzero cumulative effect.[15] The information in 10-K filings helps me determine not only whether the accounting change is mandatory or voluntary but also which mandatory accounting change caused firms to book the cumulative effect. Requiring electronic 10-K filings from Edgar constrains my sample to begin in 1991.

The above criteria yield 5530 firm-year observations between 1991 and 2007. Removing observations that are missing data for assets and the independent variables in my analyses, as well as firms in any regulated or financial industry, reduces my sample to 3473 observations. Missing 10-K filings and 10-K filings with insufficient information about the cumulative effect reduce my sample, to 3012 observations. Of these, 2795 (217) observations have mandatory (voluntary) accounting changes. My final sample for the Capex analyses comprises 2795 firm-years. R&D and acquisition expenditure data are missing for a number of observations in my sample, and prior research typically assumes that these firms have zero R&D and acquisitions, respectively. However, Koh and Reeb (2015) find that many firms that fail to report R&D in their financial statements have a significant number of patents, thereby invalidating the assumption that missing R&D implies a firm has zero R&D investment. They also go on to show that treating missing R&D as zero R&D engenders substantive bias into the analyses. In order to mitigate any biases from coding missing R&D and acquisitions as zero, I restrict my

[14] I do not include firms with zero cumulative effects because I cannot tell whether such firms are truly unaffected by the change in GAAP or report a zero cumulative effect due to the method in which they adopt the standard. Specifically, firms can have a zero cumulative effect because (1) they are unaffected by the accounting change or (2) they choose a method of adoption that does not require them to recognize a cumulative effect. Nevertheless, my inferences are unchanged if I use firm-years with zero cumulative effects as control firm-years in my main tests (untabulated).

[15] My inferences are unchanged if I retain observations with voluntary accounting changes in my sample (untabulated).

analyses to firm-years with non-missing R&D and non-missing acquisition, which reduces my final sample for the R&D (acquisition) analyses to 1390 (1047).[16,17]

I also require data on the presence of financial covenants to test the contracting hypothesis, which I obtain from the Dealscan database. Dealscan contains data on loan contracts for 59% of my sample. I assume that observations not in Dealscan do not have private debt contracts.[18] For the subset of observations with financial covenants on Dealscan, I obtain their actual debt contracts from either Amir Sufi's website or Edgar, and hand-collect data from these contracts on the contracting practices—i.e., fixed or floating GAAP—used in them. I drop the 281 observations for which I am unable to find the actual contract on Edgar even though these observations have debt agreements and covenants on Dealscan. As a result, the final sample for the analyses of the contracting hypothesis is further reduced to 2514 (1281; 900) observations when investment is measured as Capex (R&D; Acquisitions). Table 1 provides a detailed breakdown of the sample construction.

## 4 Research design and results

### 4.1 Descriptive statistics

Table 2, Panel A shows the major accounting changes in my sample along with the years of adoption, methods of implementing the standard, mean *CUMU_EFF* for the rule change and its standard deviation, number of observations for each standard, and whether the standard is classified as informative to managers. The table shows that there is considerable variation in the average *CUMU_EFF* across the standards. Table 2, Panel B shows the number of observations and the accounting standards adopted each year, along with the scaled and unscaled mean cumulative effect.

Table 3 reports the summary statistics for variables used in the regression analysis. The mean (median) *CUMU_EFF* is −2.6% (−0.3%) of assets, suggesting that accounting rule changes can have economically significant impacts on bottom line earnings and book equity. The mean *CAPEX* (*R&D*; *ACQ*; *TOTAL INVEST*) is 6.1% (6.6; 5.4; 11.4%). The average firm in my sample is 21 years old, has a market value of equity of $3.3 billion, and has cash flows from operations equal to 6.7% of assets. These statistics indicate that the average firm in my sample is large and

[16] Koh and Reeb (2015) suggest an alternative remedy for dealing with missing R&D observations that involves using industry averages. However, since my research question concerns how individual firms adjust their R&D activities in response to changes in GAAP, using an industry average would be inappropriate.

[17] My inferences are unchanged if I include observations with missing R&D and acquisitions in my sample and treat such observations as having zero R&D and acquisition expenditures, respectively.

[18] The Dealscan database contains between 50 and 75% of the value of all commercial loans in the United States during the early 1990s (Carey and Hrycray 1999). From 1995 onward, Dealscan coverage increases to include an even greater fraction of commercial loans (Chava and Roberts 2008). Therefore, assuming that only the firms covered by Dealscan have private debt agreements is unlikely to cause much measurement error.

**Table 1** Sample selection

| Details | | Observations dropped | Observations remaining |
|---|---|---|---|
| Observations in the intersection of CRSP and Compustat with fiscal years greater than 1990 and with non-zero values for the cumulative effect of an account change | | – | 5530 |
| Less: | Observations missing data to compute average assets | 289 | 5241 |
| Less: | Regulated and financial firms (SIC's in the 4000's and 6000's) | 1338 | 3903 |
| Less: | Observations missing data to compute investment | 110 | 3793 |
| Less: | Observations missing data to compute independent variables | 320 | 3473 |
| Less: | Observations missing 10 K's or the cumulative effect of an accounting change the in 10 K | 447 | 3026 |
| Less: | Observations where the cumulative effect of an accounting change in the 10 K does not match that in Compustat | 14 | 3012 |
| Final sample | | | |
| | Voluntary accounting changes | | 217 |
| | Mandatory changes in GAAP (for CAPEX regressions) | | 2795 |
| | Mandatory changes in GAAP (with non-missing R&D) | | 1390 |
| | Mandatory changes in GAAP (with non-missing acquisitions) | | 1047 |
| Less: | Observations with covenants but missing debt contracts (which are needed to collect information about the type of GAAP i.e., fixed, floating, or hybrid) for CAPEX/R&D/Acquisition regressions | 281; 109; 147 | 2514; 1281; 900 |
| | Final sample for analyses which use covenant data (for CAPEX regressions) | | 2514 |
| | Final sample for analyses which use covenant data (with non-missing R&D for R&D regressions) | | 1281 |
| | Final sample for analyses which use covenant data (with non-missing acquisitions for acquisition regressions) | | 900 |

profitable. However, the other statistics in the table show that there is considerable variation in these firm characteristics.

### 4.2 Do changes in GAAP affect investment?

To examine the relation between changes in GAAP and investment, I begin by testing whether *CUMU_EFF* is associated with *CAPEX*, *R&D*, *ACQ*, and *TOTAL INVEST*. I estimate Eq. 2 using ordinary least squares (OLS), and I compute standard errors by clustering them at the industry and year level (Petersen 2009; Gow et al. 2010). Column 1 in Table 4, Panel A reports the results from estimating Eq. 2 when *CAPEX* is the dependent variable. I find that the coefficient on *CUMU_EFF* is positive and statistically significant at the 1% level (coef. = 0.116, t-stat. = 4.18). This coefficient suggests that changes in accounting standards affect

**Table 2** Descriptive details of the changes in GAAP, years of adoption, and method of adoption

| Standard groups | Title | Info. | Number of Obs. | Primary years of adoption | Mandatory adoption date | Method of implementation | Avg. Cum. effect | Std. of Cum. effect |
|---|---|---|---|---|---|---|---|---|
| *Panel A: Descriptive details classified by the major changes in GAAP in my sample* | | | | | | | | |
| EITF | 18 different EITF's | 0 | 78 | – | – | – | −0.0199 | 0.0595 |
| EITF 97-13 | Accounting for reengineering costs | 0 | 48 | 1997–1998 | Fiscal period containing Nov. 20, 1997 | Catch up | −0.0044 | 0.0049 |
| FIN 44 | Acc. for certain transactions involving stock compensation | 0 | 3 | 2000 | July, 2000 | Prospective and catch up | 0.0341 | 0.0355 |
| FIN 46/46r | Consolidation of variable interest entities | 0 | 51 | 2003–2004 | First reporting period ending after March (Dec) 15, 2004 | Catch up or retroactive catch up | −0.0046 | 0.0074 |
| FIN 47 | Accounting for conditional asset retirement obligations | 1 | 87 | 2005–2006 | Fiscal years ending after Dec. 15, 2005 | Catch up | −0.0011 | 0.0012 |
| Other | Include FTB 90.1 and practice bulletin 13 | 0 | 3 | 1991, 1995 | – | – | −0.0412 | 0.0336 |
| SAB 92 | Environmental liabilities | 0 | 1 | 1993 | June, 1993 | – | −0.0046 | . |
| SAB 101 | Revenue recognition | 0 | 235 | 2000–2001 | Fiscal years beginning after 1999 Q1 | Catch up | −0.0403 | 0.0676 |
| SFAS 106 | Postretirement benefits | 1 | 414 | 1992–1993 | Fiscal years beginning after Dec. 15, 1992 | Catch up or delayed recognition in NI | −0.0383 | 0.0478 |
| SFAS 109 | Income taxes | 1 | 543 | 1992–1994 | Fiscal years beginning after Dec. 15, 1992 | Catch up | 0.0090 | 0.0241 |
| SFAS 112 | Postemployment benefits | 1 | 96 | 1993–1995 | Fiscal years beginning after Dec. 15, 1993 | Catch up | −0.0053 | 0.0070 |
| SFAS 115 | Accounting for certain investments in debt and equity securities | 0 | 27 | 1994–1995 | Fiscal years beginning after Dec. 15, 1993 | Catch up | 0.0101 | 0.0174 |
| SFAS 121 | Impairment of long-lived assets | 1 | 11 | 1995–1996 | Fiscal years beginning afterDec. 15, 1995 | Catch up | −0.0006 | 0.0284 |

**Table 2** continued

| Standard groups | Title | Info. | Number of Obs. | Primary years of adoption | Mandatory adoption date | Method of implementation | Avg. Cum. effect | Std. of Cum. effect |
|---|---|---|---|---|---|---|---|---|
| SFAS 123r | Expensing of stock options | 0 | 112 | 2006–2007 | First reporting period beginning after June (Dec) 15, 2005 | Modified prospective & retrospective, catch up | 0.0004 | 0.0020 |
| SFAS 133/138 | Derivatives and hedges accounting | 0 | 141 | 2001–2002 | Fiscal years beginning after June 15, 2000 | Catch up through NI or OCI | −0.0019 | 0.0276 |
| SFAS 141 | Business combinations | 0 | 3 | 2002 | Combinations initiated after June 30, 2001 | Catch up | 0.0076 | 0.0049 |
| SFAS 142 | Accounting for goodwill | 1 | 543 | 2002–2003 | Fiscal years beginning after March 15, 2001 | Catch up | −0.0856 | 0.0994 |
| SFAS 143 | Asset retirement obligation | 1 | 173 | 2003 | Fiscal years beginning after June 15, 2002 | Catch up | −0.0007 | 0.0201 |
| SFAS 150 | Instruments with characteristicsof liabilities & equity | 0 | 7 | 2003 | Fin. instruments entered into/modified after May 31, 2003 | Catch up | −0.0005 | 0.0036 |
| SFAS Other | Includes SFAS 96, 116, 128, 152, and 159 | 0 | 10 | – | – | – | 0.0064 | 0.0115 |
| SOP 00-2 | Accounting by producers or distributors of films | 0 | 5 | 2000 | Fiscal years beginning after Dec. 15, 2000 | Catch up | −0.0251 | 0.0433 |
| SOP 97-3 | Insurance and other enterprises for insurance related assessments | 0 | 2 | 1998, 2000 | Fiscal years beginning after Dec. 15, 1998 | Catch up | −0.0030 | 0.0033 |
| SOP 98-5 | Reporting on the costs of start-up activities | 0 | 199 | 1998–2000 | Fiscal years beginning after Dec. 15, 1998 | Catch up | −0.0088 | 0.0153 |
| SOP Other | Includes SOP 93-6 and 04-2 | 0 | 3 | 1994, 2006 | – | – | −0.0061 | 0.0058 |

**Table 2** continued

| Year | No. of Obs. | Average cumulative effect (scaled) | Average cumulative effect (unscaled) | Accounting standards |
|---|---|---|---|---|
| *Panel B: Descriptive details classified by year* | | | | |
| 1991 | 42 | −0.0199 | −141.187 | SFAS 96, 106, 109; FTB 90.1 |
| 1992 | 275 | −0.0291 | −139.654 | SFAS 106, 109, 112 |
| 1993 | 447 | −0.0081 | −41.899 | EITF 93.5; SAB 92; SFAS 106, 109, 112, 115 |
| 1994 | 293 | 0.0035 | −6.215 | EITF 93.5; SOP 93.6; SFAS 106, 109, 112, 115 |
| 1995 | 43 | 0.0010 | −12.478 | EITF 95.1; Practice Bulletin 13; SFAS 109, 112, 115, 121 |
| 1996 | 4 | −0.0128 | −1.666 | SFAS 121 |
| 1997 | 36 | −0.0043 | −8.832 | EITF 97.13; SFAS 121; SOP 98.5 |
| 1998 | 85 | −0.0103 | −5.950 | EITF 97.13; SFAS 121, 128, 133; SOP 97.3, 98.5 |
| 1999 | 109 | −0.0083 | −10.560 | SAB 101; SFAS 133; SOP 98.5 |
| 2000 | 195 | −0.0404 | −17.278 | EITF 0.27, 98.5, 99.5; FIN 44; SAB 101; SFAS 133; SOP 0.2, 97.3, 98.5 |
| 2001 | 229 | −0.0137 | −18.144 | EITF 0.19; SAB 101; SFAS 133; SOP 0.2 |
| 2002 | 451 | −0.0838 | −161.660 | EITF 0.19, 1.09, 1.9, 2.16; SFAS 133, 141, 142, 143; SOP 0.2 |
| 2003 | 337 | −0.0281 | −24.306 | EITF 0.21, 2.16, 3.4; FIN 46; SFAS 142, 143, 150 |
| 2004 | 35 | −0.0100 | −194.843 | EITF 0.21, d108; FIN 46; SFAS 123r, 143, 150 |
| 2005 | 70 | −0.0030 | −17.666 | EITF 4.6, d108; FIN 46, 47; SFAS 123r |
| 2006 | 124 | −0.0005 | −10.684 | EITF 0.192, 4.6, d108; FIN 47; SFAS 123r, 152; SOP 4.2 |
| 2007 | 20 | 0.0022 | 0.964 | EITF 6.2; SFAS 123r, 159 |

Panel A in this table reports the descriptive details of the major changes in accounting standards covered in my sample. Panel B in this table reports which accounting pronouncements were adopted each year, along with the number of observations and the average cumulative effect of an accounting change for the year in my sample. In Panel A, *Info.* is an indicator variable equal to one (zero) for standards likely to inform managers. *Number of Obs.* is the number of firms in my sample adopting the accounting rule. *Method of Implementation* represents the accounting treatment for transition to the new standard. *Ave. Cum. Effect* is the average cumulative effect reported by firms adopting the standard, scaled by average assets. *Std. of Cum. Effect* is the standard deviation of the cumulative effect scaled by average assets for each standard

**Table 3** Summary statistics of variables used in the regression analyses

| Variable | Mean | SD | P1 | P5 | P50 | P95 | P99 | N |
|---|---|---|---|---|---|---|---|---|
| Investment and changes in GAAP | | | | | | | | |
| *CUMU_EFF* | −0.026 | 0.064 | −0.359 | −0.153 | −0.003 | 0.016 | 0.068 | 2795 |
| *CAPEX* | 0.061 | 0.061 | 0.002 | 0.007 | 0.042 | 0.183 | 0.339 | 2795 |
| *R&D* | 0.066 | 0.080 | 0.001 | 0.004 | 0.033 | 0.238 | 0.377 | 1388 |
| *ACQ* | 0.054 | 0.088 | 0.000 | 0.001 | 0.019 | 0.232 | 0.412 | 1047 |
| *TOTAL INVEST* | 0.114 | 0.102 | 0.003 | 0.012 | 0.085 | 0.334 | 0.467 | 2795 |
| Determinants of investment and control variables | | | | | | | | |
| *TOBINS'S_Q* | 1.321 | 1.024 | 0.236 | 0.454 | 1.006 | 3.363 | 6.275 | 2795 |
| *GROWTH* | 0.080 | 0.346 | −0.586 | −0.342 | 0.035 | 0.605 | 1.987 | 2795 |
| *AGE* | 2.714 | 0.898 | 0.693 | 1.099 | 2.890 | 3.912 | 3.989 | 2795 |
| *MVE* | 5.912 | 2.242 | 1.217 | 2.225 | 5.918 | 9.719 | 11.099 | 2795 |
| *CFO* | 0.067 | 0.113 | −0.422 | −0.128 | 0.076 | 0.225 | 0.335 | 2795 |
| *CASH* | 0.129 | 0.188 | 0.000 | 0.003 | 0.054 | 0.537 | 1.039 | 2795 |
| *LEVERAGE* | 0.256 | 0.199 | 0.000 | 0.000 | 0.235 | 0.631 | 0.915 | 2795 |
| Information and debt contracting proxies | | | | | | | | |
| *INFO* | 0.668 | 0.471 | 0 | 0 | 1 | 1 | 1 | 2795 |
| *DEALSCAN* | 0.587 | 0.492 | 0 | 0 | 1 | 1 | 1 | 2795 |
| *COVENANT* | 0.233 | 0.423 | 0 | 0 | 0 | 1 | 1 | 2795 |
| *FLOATING_GAAP* | 0.037 | 0.189 | 0 | 0 | 0 | 0 | 1 | 2514 |
| *FIXED_GAAP_CONT* | 0.439 | 0.497 | 0 | 0 | 0 | 1 | 1 | 371 |
| *HYBRID_GAAP_CONT* | 0.358 | 0.480 | 0 | 0 | 0 | 1 | 1 | 371 |

**Table 3** continued

| Variable | Mean | SD | P1 | P5 | P50 | P95 | P99 | N |
|---|---|---|---|---|---|---|---|---|
| *FLOATING_GAAP_CONT* | 0.202 | 0.402 | 0 | 0 | 0 | 1 | 1 | 371 |
| *DISCLOSE_RECON* | 0.054 | 0.226 | 0 | 0 | 0 | 1 | 1 | 371 |

In the table above, ***CUMU_EFF*** (ACCHG) is the cumulative effect of an accounting change as reported in the income statement deflated by average assets in period t and t − 1. ***CAPEX*** (CAPX) is the cash outflow or the funds used for additions to the company's property, plant, and equipment, excluding amounts arising from acquisitions, reported in the Statement of Cash Flows deflated by average assets in period t and t − 1. ***R&D*** (XRD) is the cost incurred during the year that relate to the development of new products or services deflated by average assets in period t and t − 1. ***ACQ*** (AQC) is the cost incurred during the year that relates to corporate acquisitions, deflated by average assets in period t and t − 1. ***TOTAL INVEST*** is the sum of *CAPEX*, *R&D*, and *ACQ*. ***TOBIN'S_Q*** is measured as the sum of market value of equity (PRCC_F × CSHO), short-term debt (DLC), and long-term debt (DLTT) divided by total assets (AT). ***GROWTH*** is the change in total assets (AT) from period t − 1 to period t scaled by total assets (AT) in period t − 1. ***AGE*** is the natural logarithm of the difference between the first year the firm enters Compustat and the current year. ***MVE*** is the natural logarithm of the stock price at the end of the year (PRCC_F) times the number of shares outstanding (CSHO). ***CFO*** (OANCF) is the cash flows from operations reported in the statement of cash flows deflated by average assets in period t and t − 1. ***CASH*** (CHE) is cash and all securities readily transferable to cash deflated by average assets in period t and t − 1. ***LEVERAGE*** is sum of short-term debt (DLC) and long-term debt (DLTT) deflated by average assets in period t and t − 1. ***INFO*** is an indicator variable equal to one for observations in which the firm adopted an accounting standard that is likely to provide managers with information; zero otherwise. The accounting standards classified as likely to provide information are described in "Appendix 1". ***DEALSCAN*** is an indicator variable that takes on the value of one (zero) if the observation has (does not have) data available in the Dealscan database. ***COVENANT*** is an indicator variable that takes on the value of one (zero) if the observation has (does not have) at least one financial covenant that is likely to be affected by the cumulative effect of an accounting change. ***FLOATING_GAAP*** is an indicator variable that takes on the value of one if the debt agreement has a covenant and uses the floating GAAP practice or requires the firm to disclose reconciliations between the old and new accounting practice while renegotiating covenants to adjust for the change in GAAP. ***FIXED_GAAP_CONT***, ***HYBRID_GAAP_CONT***, and ***FLOATING_GAAP_CONT*** are indicator variables that take on the value of one (zero) if the debt contract is based on Fixed, Hybrid, or Floating GAAP, respectively. ***DISCLOSE_RECON*** is an indicator variable that equals one (zero) if the debt contract requires the firm to reconcile and disclose differences in financial ratios after changes in GAAP while renegotiating covenants. All continuous variables are winsorized at the 1 and 99% of their empirical distribution

**Table 4** Regression of investment on its determinants and the cumulative effect of an accounting change

| Dependent variable | Pr. sign | $CAPEX_t$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | OLS estimator | | | Erickson–Whited estimator | | |
| | | Base-line | Comp. | Comp. | Base-line | Comp. | Comp. |
| Panel A: Investment measured as capital expenditure | | | | | | | |
| $CUMU\_EFF_t$ | + | 0.116*** | 0.049*** | 0.023*** | 0.066*** | 0.035*** | 0.025** |
| | | (*4.18*) | (*4.22*) | (*2.66*) | (*2.94*) | (*2.65*) | (*1.69*) |
| $TOBIN'S\_Q_{t-1}$ | | 0.006*** | 0.005*** | 0.005*** | 0.042*** | 0.025*** | 0.026*** |
| | | (*4.70*) | (*6.63*) | (*7.02*) | (*4.52*) | (*3.42*) | (*3.46*) |
| $CFO_t$ | | 0.149*** | 0.069*** | 0.072*** | 0.192*** | 0.075*** | 0.069*** |
| | | (*2.94*) | (*3.03*) | (*3.34*) | (*8.13*) | (*5.46*) | (*5.01*) |
| $CASH_{t-1}$ | | | −0.006 | −0.004 | | −0.038*** | −0.034*** |
| | | | (*−1.41*) | (*−0.82*) | | (*−2.75*) | (*−2.60*) |
| $GROWTH_{t-1}$ | | | 0.011*** | 0.010*** | | −0.010 | −0.008 |
| | | | (*3.72*) | (*2.89*) | | (*−1.09*) | (*−1.04*) |
| $AGE_{t-1}$ | | | −0.000 | −0.001 | | 0.006** | 0.005** |
| | | | (*−0.10*) | (*−0.48*) | | (*2.33*) | (*2.12*) |
| $LEVERAGE_{t-1}$ | | | 0.001 | 0.003 | | 0.013* | 0.013* |
| | | | (*0.15*) | (*0.58*) | | (*1.65*) | (*1.78*) |
| $MVE_{t-1}$ | | | −0.001** | −0.000 | | −0.004*** | −0.004*** |
| | | | (*−1.99*) | (*−0.78*) | | (*−3.12*) | (*−2.82*) |
| $CAPEX_{t-1}$ | | | 0.618*** | 0.597*** | | 0.601*** | 0.586*** |
| | | | (*16.26*) | (*16.79*) | | (*17.92*) | (*17.38*) |
| Clustered SE | | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year |
| Industry fixed effects | | No | Yes | Yes | No | Yes | Yes |
| Accounting Std. fixed effects | | No | No | Yes | No | No | Yes |
| Number of observations | | 2795 | 2795 | 2795 | 2795 | 2795 | 2795 |
| Adjusted $R^2$ | | 0.12 | 0.59 | 0.60 | 0.12 | 0.59 | 0.60 |

**Table 4** continued

| Dependent variable | Pr. sign | $R\&D_t$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | OLS estimator | | | Erickson–Whited estimator | | |
| | | Base-line | Comp. | Comp. | Base-line | Comp. | Comp. |
| Panel B: Investment measured as R&D expenditure | | | | | | | |
| $CUMU\_EFF_t$ | + | 0.052*** | 0.052*** | 0.044*** | 0.031** | 0.043*** | 0.051*** |
| | | (*4.55*) | (*5.06*) | (*5.77*) | (*1.87*) | (*2.31*) | (*2.53*) |
| $TOBIN'S\_Q_{t-1}$ | | 0.007*** | 0.006*** | 0.006*** | 0.016*** | 0.022*** | 0.020*** |
| | | (*6.74*) | (*5.98*) | (*6.23*) | (*5.05*) | (*3.46*) | (*3.43*) |
| $CFO_t$ | | −0.020 | −0.019 | −0.019 | −0.025** | −0.030* | −0.034** |
| | | (*−1.04*) | (*−0.81*) | (*−0.85*) | (*−2.03*) | (*−1.84*) | (*−2.15*) |
| $CASH_{t-1}$ | | | 0.001 | −0.003 | | −0.008 | −0.012 |
| | | | (*0.08*) | (*−0.26*) | | (*−0.76*) | (*−1.09*) |
| $GROWTH_{t-1}$ | | | 0.008*** | 0.007*** | | −0.021* | −0.013 |
| | | | (*3.66*) | (*3.06*) | | (*−1.77*) | (*−1.44*) |
| $AGE_{t-1}$ | | | −0.001* | −0.001 | | 0.004 | 0.003 |
| | | | (*−1.96*) | (*−1.57*) | | (*1.50*) | (*1.31*) |
| $LEVERAGE_{t-1}$ | | | −0.011 | −0.008 | | −0.003 | −0.003 |
| | | | (*−1.20*) | (*−0.88*) | | (*−0.37*) | (*−0.42*) |
| $MVE_{t-1}$ | | | 0.000 | 0.000 | | −0.003** | −0.003** |
| | | | (*0.19*) | (*0.10*) | | (*−2.08*) | (*−2.21*) |
| $R\&D_{t-1}$ | | | 0.836*** | 0.831*** | | 0.728*** | 0.752*** |
| | | | (*22.24*) | (*19.51*) | | (*14.98*) | (*18.06*) |
| Clustered SE | | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year |
| Industry fixed effects | | No | Yes | Yes | No | Yes | Yes |
| Accounting Std. fixed effects | | No | No | Yes | No | No | Yes |
| Number of observations | | 1390 | 1390 | 1390 | 1390 | 1390 | 1390 |
| Adjusted $R^2$ | | 0.42 | 0.88 | 0.89 | 0.42 | 0.88 | 0.89 |

**Table 4** continued

| Dependent variable | Pr. sign | $ACQ_t$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | OLS estimator | | | Erickson–Whited estimator | | |
| | | Base-line | Comp. | Comp. | Base-line | Comp. | Comp. |
| Panel C: Investment measured as acquisition expenditure | | | | | | | |
| $CUMU\_EFF_t$ | + | 0.104*** | 0.082*** | 0.064** | 0.046 | 0.043** | 0.390** |
| | | (*4.26*) | (*3.36*) | (*2.04*) | (*0.39*) | (*1.83*) | (*1.97*) |
| $TOBIN'S\_Q_{t-1}$ | | 0.007** | 0.005* | 0.005* | 0.003 | 0.061* | 0.052** |
| | | (*2.40*) | (*1.94*) | (*1.91*) | (*0.42*) | (*1.79*) | (*2.07*) |
| $CFO_t$ | | 0.020 | 0.085*** | 0.088*** | 0.322 | −3.371* | −2.602** |
| | | (*0.62*) | (*3.17*) | (*2.94*) | (*0.55*) | (*−1.76*) | (*−1.98*) |
| $CASH_{t-1}$ | | | 0.063*** | 0.068*** | | −0.725* | −0.587* |
| | | | (*3.01*) | (*3.59*) | | (*−1.66*) | (*−1.83*) |
| $GROWTH_{t-1}$ | | | −0.008 | −0.009 | | −0.128* | −0.085* |
| | | | (*−1.08*) | (*−1.00*) | | (*−1.67*) | (*−1.81*) |
| $AGE_{t-1}$ | | | −0.011*** | −0.011*** | | 0.005 | 0.000 |
| | | | (*−2.90*) | (*−2.70*) | | (*0.33*) | (*0.01*) |
| $LEVERAGE_{t-1}$ | | | 0.106*** | 0.106*** | | −0.254 | −0.179 |
| | | | (*3.32*) | (*3.31*) | | (*−1.22*) | (*−1.23*) |
| $MVE_{t-1}$ | | | 0.003*** | 0.003*** | | 0.031* | 0.026** |
| | | | (*2.70*) | (*2.81*) | | (*1.85*) | (*2.08*) |
| $ACQ_{t-1}$ | | | 0.051** | 0.041* | | 0.352* | 0.260* |
| | | | (*2.05*) | (*1.72*) | | (*1.80*) | (*1.95*) |
| Clustered SE | | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year |
| Industry fixed effects | | No | Yes | Yes | No | Yes | Yes |
| Accounting Std. fixed effects | | No | No | Yes | No | No | Yes |
| Number of observations | | 1047 | 1047 | 1047 | 1047 | 1047 | 1047 |
| Adjusted $R^2$ | | 0.02 | 0.10 | 0.10 | 0.02 | 0.10 | 0.10 |

**Table 4** continued

| Dependent variable | Pr. sign | $TOTAL\ INVEST_t$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | OLS estimator | | | Erickson–Whited estimator | | |
| | | Base-line | Comp. | Comp. | Base-line | Comp. | Comp. |
| Panel D: Investment measured as the sum of capital expenditures, R&D, and acquisitions | | | | | | | |
| $CUMU\_EFF_t$ | + | 0.083* | 0.080*** | 0.028* | 0.069*** | 0.075*** | 0.058*** |
| | | (*1.71*) | (*2.86*) | (*1.80*) | (*2.40*) | (*3.35*) | (*2.49*) |
| $TOBIN'S\_Q_{t-1}$ | | 0.026*** | 0.018*** | 0.016*** | 0.037*** | 0.025*** | 0.024** |
| | | (*16.81*) | (*13.38*) | (*12.36*) | (*12.15*) | (*2.87*) | (*2.54*) |
| $CFO_t$ | | −0.029 | 0.036 | 0.048 | −0.016 | 0.038* | 0.043** |
| | | (*−0.35*) | (*0.70*) | (*0.95*) | (*−0.67*) | (*1.71*) | (*2.03*) |
| $CASH_{t-1}$ | | | 0.078*** | 0.084*** | | 0.066*** | 0.070*** |
| | | | (*4.58*) | (*4.88*) | | (*3.70*) | (*4.02*) |
| $GROWTH_{t-1}$ | | | −0.016*** | −0.020*** | | −0.024** | −0.024** |
| | | | (*−2.86*) | (*−4.34*) | | (*−2.21*) | (*−2.53*) |
| $AGE_{t-1}$ | | | −0.006*** | −0.006*** | | −0.004 | −0.005 |
| | | | (*−3.44*) | (*−3.28*) | | (*−1.21*) | (*−1.59*) |
| $LEVERAGE_{t-1}$ | | | 0.044** | 0.048** | | 0.048*** | 0.053*** |
| | | | (*2.11*) | (*2.36*) | | (*3.46*) | (*3.97*) |
| $MVE_{t-1}$ | | | 0.002** | 0.003*** | | 0.001 | 0.001 |
| | | | (*2.05*) | (*3.46*) | | (*0.38*) | (*0.60*) |
| $TOTAL\ INVESTMENT_{t-1}$ | | | 0.387*** | 0.375*** | | 0.381*** | 0.380*** |
| | | | (*12.12*) | (*12.28*) | | (*14.08*) | (*14.09*) |
| Clustered SE | | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year |
| Industry fixed effects | | No | Yes | Yes | No | Yes | Yes |
| Accounting Std. fixed effects | | No | No | Yes | No | No | Yes |

**Table 4** continued

| Dependent variable | Pr. sign | *TOTAL INVEST*$_t$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | OLS estimator | | | Erickson–Whited estimator | | |
| | | Base-line | Comp. | Comp. | Base-line | Comp. | Comp. |
| Number of observations | | 2795 | 2795 | 2795 | 2795 | 2795 | 2795 |
| Adjusted $R^2$ | | 0.15 | 0.39 | 0.40 | 0.15 | 0.39 | 0.40 |

Panel A (B, C, D) in this table presents the results from regressing *CAPEX* (*R&D*, *ACQ*, *TOTAL INVEST*) on its determinants and the cumulative effect of an accounting change. The t-statistics are reported in parentheses below the coefficients. All variables are defined in "Appendix 3". All continuous variables are winsorized at the 1 and 99% of their empirical distribution

***,**,* Statistical significance at the one (two) tail 1, 5, and 10% levels when I (do not) have a directional prediction

corporate investment decisions, consistent with my main hypothesis. The coefficients on *TOBIN'S_Q* and *CFO* are also positive and significant at the 1% level, consistent with prior research (e.g., Fazzari et al. 1988; Rauh 2006).

In Column 2, I examine whether my results are robust to including additional control variables used in prior accounting research on investment. Specifically, I control for *CASH*, *GROWTH* (change in total assets), *AGE*, *LEVERAGE*, and *MVE* (the market value of equity) following McNichols and Stubben (2008), Biddle et al. (2009), and Kausar et al. (2016). I control for lagged investment, which gives the regression coefficients a changes interpretation and captures a firm-specific component to investment decisions not captured by the other variables (McNichols and Stubben 2008). Finally, I include indicator variables for each two-digit SIC industry in my regressions (Biddle et al. 2009; Badertscher et al. 2013). Column 2 in Table 4, Panel A shows that the coefficient on *CUMU_EFF* remains positive and significant (coef. = 0.049, t-stat. = 4.22) when I control for the additional variables. Further, the coefficients on the control variables are also consistent with that documented in prior research. For example, I find that the coefficients on *TOBIN'S_Q*, *CFO*, *GROWTH*, and lag *CAPEX* are all positive and significant, consistent with those documented by Fazzari et al. (1988), McNichols and Stubben (2008), Biddle et al. (2009) and Kausar et al. (2016).

Column 3 in Table 4, Panel A reports regression results when I include 23 indicator variables, one for each accounting standard group reported in Table 2. The benefit of including fixed effects for accounting standards is that the idiosyncratic attributes of individual accounting rules are filtered out in the estimation, thereby increasing the external validity of my inferences. However, the drawback is that some information that is relevant for documenting a relation between accounting changes and investment will also get filtered out in the process. I find that the coefficient on *CUMU_EFF* continues to be positive and significant at the 1% level, but it drops in magnitude from 0.049 to 0.023. This is expected given that only a subset of the variation in *CUMU_EFF* is used to estimate the relation between the accounting changes and investment.

Next, to mitigate concerns that the association between the cumulative effect and investment is due to measurement error in *TOBIN'S_Q*, I examine the robustness of the above result to using the measurement error remedy proposed by Erickson and Whited (2000; EW henceforth). EW use a generalized method of moments (GMM) estimator to exploit the information contained in the higher-order moments of the observed regression variables to increase the precision of the estimates and mitigate any effects of measurement error. Columns 4–6 in Table 4, Panel A present the results when I use the EW estimator to test my hypothesis. Consistent with the previous results, I find that the coefficient on *CUMU_EFF* is positive and significant at the 5% level or better in the three regression models discussed above. Further, I find that the coefficient on *TOBIN'S_Q* increases in the EW specification compared to the OLS estimate of the coefficient, which is consistent with a reduction in measurement error in *TOBIN'S_Q*. In terms of economic magnitude, a one standard deviation increase in *CUMU_EFF* is associated with a 2.4% increase in *CAPEX* from its mean (in regression with the comprehensive set of control variables presented in column 3).

Table 4, Panels B, C, and D repeat all the above analyses with *R&D*, *ACQ*, and *TOTAL INVEST* as the dependent variables, respectively. Consistent with the results reported in Table 4, Panel A, I find that the coefficient on *CUMU_EFF* remains positive and significant across all regression specifications for all three dependent variables *R&D*, *ACQ*, and *TOTAL INVEST*, with one exception; the coefficient on *CUMU_EFF* is positive but insignificant in the base-line Erickson-Whited model when the dependent variable is *ACQ*. In terms of economic magnitude, a one standard deviation increase in *CUMU_EFF* is associated with a 4.3% (7.6; 1.6%) increase in *R&D* (*ACQ*; *TOTAL INVEST*) based on the regression in column 3 in the panels. Overall, the results in Table 4 suggest that changes in GAAP affect Capex, R&D expenditures, and acquisition expenditures.[19]

For the remainder of the analyses, I tabulate results where I include the entire set of control variables in my regressions with industry and accounting standard fixed effects (as described in Table 4, column 3). The expanded model helps mitigate potential correlated omitted variable bias in my regression estimates.[20]

### 4.3 Why do changes in GAAP affect investment? Tests of the contracting hypothesis

Next, I examine whether changes in GAAP affect investment decisions by altering the probability of violating debt covenants (contracting hypothesis). To test this hypothesis, I exploit variation in (1) the definition of GAAP used in debt contracts (i.e., floating GAAP vs. others) and (2) the presence of accounting covenants in debt contracts. Prior research identifies three common debt contracting practices: the "fixed GAAP" practice, which excludes all accounting changes once the contract is signed; the "floating GAAP" practice, which uses the most up-to-date GAAP; and a hybrid that gives lenders and borrowers a "mutual option to fix" GAAP at any point in time (see Beatty et al. 2002; Christensen and Nikolaev 2012). The covenants in debt contracts that use fixed or hybrid GAAP are unaffected by changes in GAAP because they *explicitly disallow* (or provide contracting parties the option to disallow) such changes to covenants. Thus, changes in GAAP are likely to affect investment via the contracting channel only when debt contracts are based on floating GAAP. To incorporate this institutional feature of debt contracts in my tests, I hand-collect data on the contract type by reading all debt contracts for my sample firms and constructing an indicator variable—*FLOATING_GAAP*—that equals one if (1) the debt contract uses the floating GAAP, and (2) there is at least

[19] In untabulated analyses, I verify that my results are robust to measuring investment in changes rather than levels; retaining only one observation per firm; and dropping one standard at a time and re-estimating my results.

[20] The Erickson–Whited (EW) methodology is fairly onerous on the data because it requires estimates of higher order moments of the covariates. As a result, the EW approach has limited power in small samples. In fact, Erickson and Whited (2000, p. 1043) indicate that their estimator has "limited power for the smaller sample sizes." Thus, I tabulate the results using this methodology for the main tests in the paper (given my relatively small sample size compared to other studies that use the entire Compustat population) and continue to use OLS as the main specification in the paper.

one covenant that is affected by the cumulative effect of an accounting change.[21] Specifically, I estimate the following regression to test the contracting hypothesis:

$$\begin{aligned} INVESTMENT_{i,t} = {} & \beta_0 + \beta_1 TOBIN'S\_Q_{i,t-1} + \beta_2 CFO_t + \beta_3 CUMU\_EFF \\ & \times FLOATING\_GAAP_{i,t} \beta_4 CUMU\_EFF \\ & \times NO\_FLOATING\_GAAP_{i,t} + \beta_5 FLOATING\_GAAP_{i,t} \\ & \sum \lambda' CONTROLS + \varepsilon_{i,t} \end{aligned} \tag{3}$$

where *NO_FLOATING_GAAP* is an indicator variable that takes the value of one if *FLOATING_GAAP* equals zero, and *CONTROLS* is a vector of the control variables described earlier.[22] All other variables are as described before. The coefficients of interest in Eq. 3 are $\beta_3$ and $\beta_4$, which capture the relation between changes in GAAP and investment for firms with and without debt covenants that can be affected by an accounting change, respectively.

Table 5 presents the results from estimating Eq. 3. Columns 1, 2, 3, and 4 in Table 5 present the results when Capex, R&D, acquisitions, and total investment are the dependent variables, respectively. The first column shows that the coefficients on both *CUMU_EFF* × *FLOATING_GAAP* and *CUMU_EFF* × *NO_FLOATING_GAAP* are positive and significant (coef. = 0.062 and 0.032, t-stat. = 1.74 and 4.03, respectively). Although the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is larger than that on *CUMU_EFF* × *NO_FLOATING_GAAP*, the difference between these coefficients is insignificant ($p$ value = 0.19). These results suggest that changes in GAAP have a similar effect on *CAPEX* when firms have contracts affected by accounting changes and when contracts are unaffected by accounting changes. Thus, these results provide limited support for the contracting hypothesis, at least with respect to Capex decisions. One potential reason for the weak evidence linking changes in GAAP to Capex via debt contracts is because debt covenants often rely on earnings metrics excluding depreciation such as EBITDA rather than income after depreciation. As a result, the depreciation of Capex is likely to be irrelevant for income statement based covenants.

Column 2 shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is positive and significant at the 10% level but the coefficient on *CUMU_EFF* × *NO_FLOATING_GAAP* is insignificant (coef. = 0.227 and 0.030, t-stat. = 1.53 and 0.95, respectively). Further, the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is significantly larger than that on *CUMU_EFF* × *NO_FLOATING_GAAP* ($p$ value = 0.099). These results are consistent with the contracting hypothesis and suggest that changes in GAAP affect R&D investment when debt contracts contain covenants that are affected by changes in GAAP (but not otherwise).

[21] Debt contracts include several covenants, not all of which are affected by the cumulative effect. For example, a covenant limiting the maximum debt to cash flows ratio is unaffected by the cumulative effect since the cumulative effect does not have any direct cash flow implication.

[22] Note that many of the observations in my sample have *NO_FLOATING_GAAP* equal to one because they do not have a debt contract in the Dealscan database, and I assume that such firm-years do not have private debt contract (and thus no contract that uses floating GAAP).

**Table 5** Regression of investment on its determinants, the cumulative effect, and debt contract characteristics

| Dependent variable | Pr. sign | $CAPEX_t$ | $R\&D_t$ | $ACQ_t$ | $TOTAL\ INVEST_t$ |
|---|---|---|---|---|---|
| $CUMU\_EFF \times FLOATING\_GAAP_t$ | + | 0.062** | 0.227* | 0.276* | 0.151** |
| | | (*1.74*) | (*1.53*) | (*1.50*) | (*1.83*) |
| $CUMU\_EFF \times NO\_FLOATING\_GAAP_t$ | | *0.032*** | *0.030* | *0.068* | *0.056*** |
| | | (*4.03*) | (*0.95*) | (*1.46*) | (*2.36*) |
| $FLOATING\_GAAP_t$ | | 0.009** | 0.000 | 0.014 | 0.020 |
| | | (*2.01*) | (*0.06*) | (*1.21*) | (*1.64*) |
| $TOBIN'S\_Q_{t-1}$ | | 0.005*** | 0.008*** | 0.005* | 0.016*** |
| | | (*7.64*) | (*14.13*) | (*1.65*) | (*16.49*) |
| $CFO_t$ | | 0.071*** | −0.113*** | 0.176*** | 0.043 |
| | | (*3.51*) | (*−3.04*) | (*3.96*) | (*0.86*) |
| $CASH_{t-1}$ | | 0.001 | 0.025** | 0.121*** | 0.083*** |
| | | (*0.29*) | (*2.51*) | (*4.11*) | (*4.31*) |
| $GROWTH_{t-1}$ | | 0.014*** | −0.004 | −0.012 | −0.018*** |
| | | (*3.37*) | (*−0.76*) | (*−1.29*) | (*−3.00*) |
| $AGE_{t-1}$ | | −0.000 | 0.001 | −0.009* | −0.007*** |
| | | (*−0.43*) | (*0.54*) | (*−1.83*) | (*−3.19*) |
| $LEVERAGE_{t-1}$ | | 0.006 | 0.004 | 0.175*** | 0.057*** |
| | | (*0.84*) | (*0.46*) | (*4.13*) | (*2.59*) |
| $MVE_{t-1}$ | | −0.001*** | −0.000 | −0.003 | 0.002** |
| | | (*−4.74*) | (*−0.34*) | (*−1.60*) | (*2.37*) |
| $CAPEX_{t-1}$ | | 0.758*** | | | |
| | | (*14.20*) | | | |
| $R\&D_{t-1}$ | | | 1.178*** | | |
| | | | (*29.46*) | | |
| $ACQ_{t-1}$ | | | | 0.059* | |
| | | | | (*1.85*) | |
| $TOTAL\ INVEST_{t-1}$ | | | | | 0.389*** |
| | | | | | (*11.40*) |
| $CUMU\_EFF \times FLOATING\_GAAP = CUMU\_EFF \times NO\_FLOATING\_GAAP$ | | 0.190 | 0.099 | 0.101 | 0.117 |
| Clustered SE | | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year |
| Industry fixed effects | | Yes | Yes | Yes | Yes |
| Accounting Std. fixed effects | | Yes | Yes | Yes | Yes |
| Number of observations | | 2514 | 1281 | 900 | 2514 |
| Adjusted $R^2$ | | 0.60 | 0.85 | 0.12 | 0.39 |

This table presents the results from regressing investment on its determinants, the cumulative effect, and debt contract characteristics. The t-statistics are reported in parentheses below the coefficients. All variables are defined in "Appendix 3". All continuous variables are winsorized at the 1 and 99% of their empirical distribution

***,**,* Statistical significance at the one (two) tail 1, 5, and 10% levels when I (do not) have a directional prediction

Column 3 shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is positive and significant at the 10% level but the coefficient on *CUMU_EFF* × *NO_FLOATING_GAAP* is insignificant (coef. = 0.276 and 0.056, t-stat. = 1.50 and 1.46, respectively). In addition, the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is significantly larger than that on *CUMU_EFF* × *NO_FLOATING_GAAP* ($p$ value = 0.101). These results are again consistent with the contracting hypothesis and suggest that changes in GAAP affect acquisition expenditures when debt contracts contain covenants that are affected by changes in GAAP. Column 4 presents the results with total investment as the dependent variable and provides similar inferences—i.e., that changes in GAAP have a larger effect on total investment when debt contracts are based on floating GAAP compared to when they are based on fixed GAAP.

Overall, the results in Table 5 suggest that changes in GAAP affect R&D and acquisition expenditures via the contracting channel, and there is at best weak evidence suggesting that changes in GAAP affect Capex via the contracting channel. Given the differences in the accounting treatment of R&D relative to Capex (i.e., immediate expensing of R&D vs. capitalize and depreciate Capex), it is perhaps not surprising that managers are more likely to alter R&D investment in response to changes in GAAP that affect covenant slack.

### 4.4 Why do changes in GAAP affect investment? Tests of the information hypothesis

To test the information hypothesis, I exploit differences in the characteristics of the changes in GAAP and classify them into two groups, *INFO* and *NO_INFO*, based on their likelihood of providing managers with decision-facilitating information. I hand-collect data on which GAAP promulgation was adopted by each firm-year in my sample from 10-K filings. Next, to classify standards, I evaluate the likelihood that they provide managers with information along the following dimensions: (1) Whether the change in GAAP increased the amount and complexity of accrual accounting estimates that managers are required to make. Managers require information to estimate the numbers reported in public financial statements, some of which may not be readily available. Therefore, standards that increase estimation requirements are more likely to provide managers with information. (2) Whether the change in GAAP requires firms to hire outside experts such as actuaries and appraisers to aid with compliance. Those changes that require the help of outside experts are classified as more likely to inform managers (e.g., Goodwill—SFAS 142, Asset Retirement Obligation—SFAS 143). And (3) whether the *stated objective* of the new standard is to make financial statements more relevant for valuation. Although Fasb strives to make financial statements both relevant and reliable, there is generally a tradeoff between the two objectives. Therefore, some standards (e.g., SAB 101—Revenue Recognition) are designed to make financial statements more reliable, whereas other standards (e.g., SFAS 142—Goodwill) are designed to make financial statements relevant. Standards designed to improve relevance are more likely to inform managers, since relevant information by

definition should help predict future cash flows. Table 2 and "Appendix 1" contain my classification scheme and a detailed discussion of my classification choices.

To validate my classification, I examine whether *CUMU_EFF*, which arises from standards classified as more likely to inform managers, is more closely associated with concurrent stock returns than *CUMU_EFF*, which arises from standards classified as less likely to inform managers, controlling for contemporaneous changes in earnings. This test is predicated on the assumption that stock prices impound managers' information sets. Under this assumption, we would observe an association between stock returns and *CUMU_EFF*—a one-time catch-up effect of the accounting change—only if *CUMU_EFF* is associated with managers learning new information. I find that *CUMU_EFF* (arising from standards identified as more likely to inform managers) has a statistically significant association with stock returns, whereas *CUMU_EFF* (arising from standards less likely to inform managers) is unrelated to stock returns, thereby at least partially validating my classification. The results of the above tests are tabulated in "Appendix 2".[23]

Note that the cumulative effect captures the impact of an accounting change on past earnings. I use this variable to proxy for the revision in managers' expectations of future earnings from their investments. For example, SFAS 106—postretirement benefits—led firms to record significantly negative cumulative effects, as the firms underestimated the cost of retirement benefits. My assumption is that these past estimates are correlated with future estimates, and thus *CUMU_EFF* captures the extent to which managers underestimated the cost of future retirement benefits. As managers incorporate revised estimates of the cost of retirement benefits from complying with SFAS 106 into their investment decisions, we should see an association between the cumulative effect (generated by SFAS 106) and investment. I estimate the following regression to test the information hypothesis:

$$INVESTMENT_{i,t} = \beta_0 + \beta_1 TOBIN'S\_Q_{i,t-1} + \beta_2 CFO_t + \beta_3 CUMU\_EFF \times INFO_{i,t} \\ \beta_4 CUMU\_EFF \times NO\_INFO_{i,t} + \sum \lambda' CONTROLS + \varepsilon_{i,t} \quad (4)$$

where *INFO* (*NO_INFO*) is a dummy variable that equals one for standards that are likely (unlikely) to inform managers. All other variables are as defined earlier. Note that the main effect of *INFO* is absorbed by the standard fixed effects and thus not identified in the above equation.

Table 6 presents the results. Columns 1, 2, 3, and 4 present the results when Capex, R&D, acquisitions, and total investment are the dependent variables, respectively. The first column in Table 6 shows that the coefficient on *CUMU_EFF* × *INFO* is positive and significant at the 1% level (coef. = 0.041, t-stat. = 2.65), and the coefficient on *CUMU_EFF* × *NO_INFO* is statistically insignificant (coef. = −0.010, t-stat. = −0.26). Further, the F-test for the difference between these coefficients suggests that the coefficient on

[23] The computation of concurrent stock returns extends from nine months before the fiscal year end to three months after the fiscal year end, and thus includes the earnings announcement period.

**Table 6** Regression of investment on its determinants, the cumulative effect, and the likely informativeness of the change in GAAP

| Dependent variable | Pr. sign | $CAPEX_t$ | $R\&D_t$ | $ACQ_t$ | $TOTAL\ INVEST_t$ |
|---|---|---|---|---|---|
| $CUMU\_EFF \times INFO_t$ | + | 0.041*** | 0.053*** | 0.051** | 0.065*** |
| | | (*2.65*) | (*6.52*) | (*2.03*) | (*3.48*) |
| $CUMU\_EFF \times NO\_INFO_t$ | | *−0.010* | *0.007* | *0.136** | *−0.112* |
| | | (*−0.26*) | (*0.28*) | (*1.77*) | (*−1.35*) |
| $TOBIN'S\_Q_{t-1}$ | | 0.004*** | 0.006*** | 0.005* | 0.017*** |
| | | (*5.26*) | (*6.43*) | (*1.78*) | (*10.31*) |
| $CFO_t$ | | 0.083*** | −0.017 | 0.082*** | 0.071 |
| | | (*3.81*) | (*−0.78*) | (*2.73*) | (*1.35*) |
| $CASH_{t-1}$ | | −0.004 | −0.003 | 0.069** | 0.087*** |
| | | (*−0.56*) | (*−0.28*) | (*2.50*) | (*4.33*) |
| $GROWTH_{t-1}$ | | 0.009*** | 0.007*** | −0.010 | −0.022*** |
| | | (*3.08*) | (*3.81*) | (*−1.33*) | (*−3.83*) |
| $AGE_{t-1}$ | | −0.001 | −0.002* | −0.010*** | −0.007*** |
| | | (*−0.84*) | (*−1.89*) | (*−2.97*) | (*−4.55*) |
| $LEVERAGE_{t-1}$ | | 0.007 | −0.009 | 0.096*** | 0.047** |
| | | (*1.22*) | (*−1.10*) | (*3.67*) | (*2.55*) |
| $MVE_{t-1}$ | | 0.000 | 0.000 | 0.003** | 0.003*** |
| | | (*0.08*) | (*0.04*) | (*2.58*) | (*3.68*) |
| $CAPEX_{t-1}$ | | 0.668*** | | | |
| | | (*17.36*) | | | |
| $R\&D_{t-1}$ | | | 0.837*** | | |
| | | | (*24.58*) | | |
| $ACQ_{t-1}$ | | | | 0.049** | |
| | | | | (*2.00*) | |
| $TOTAL\ INVEST_{t-1}$ | | | | | 0.410*** |
| | | | | | (*14.20*) |
| $CUMU\_EFF \times INFO = CUMU\_EFF \times NO\_INFO$ | | 0.091 | 0.036 | 0.134 | 0.025 |
| Clustered SE | | Ind. and Year | Ind. and Year | Ind. and Year | Ind. and Year |
| Industry fixed effects | | Yes | Yes | Yes | Yes |
| Accounting Std. fixed effects | | Yes | Yes | Yes | Yes |
| Number of observations | | 2795 | 1390 | 1047 | 2795 |
| Adjusted $R^2$ | | 0.58 | 0.89 | 0.10 | 0.38 |

This table presents the results from regressing investment on its determinants, the cumulative effect, and the likely informativeness of the change in GAAP. The t-statistics are reported in parentheses below the coefficients. All variables are defined in "Appendix 3". All continuous variables are winsorized at the 1 and 99% of their empirical distribution

***,**,* Statistical significance at the one (two) tail 1, 5, and 10% levels when I (do not) have a directional prediction

*CUMU_EFF* × *INFO* is significantly larger than that on *CUMU_EFF* × *NO_INFO* ($p$ value = 0.091). These results suggest that changes in GAAP affect Capex when the accounting change is likely to provide managers with new information but not otherwise, which is consistent with the information hypothesis.

Similarly, columns 2 and 4 (where the dependent variables are R&D and total investment) show that the coefficient on *CUMU_EFF* × *INFO* is positive and significant at the 1% level (coef. = 0.053 and 0.065; t-stat. = 6.52 and 3.48 respectively) and the coefficient on *CUMU_EFF* × *NO_INFO* is statistically insignificant (coef. = 0.007 and −0.112; t-stat. = 0.28 and −1.35 respectively). An F-test for the difference between these coefficients suggests that the coefficient on *CUMU_EFF* × *INFO* is significantly larger than that on *CUMU_EFF* × *NO_INFO* ($p$ value = 0.036 and 0.025, respectively). These results are also consistent with the information hypothesis and suggest that changes in GAAP affect R&D investment and total investment by providing managers with new information.

In contrast to the above, column 3 shows that although the coefficient on *CUMU_EFF* × *INFO* is positive and significant at the 1% level (coef. = 0.051, t-stat. = 2.03), it is smaller in magnitude than the coefficient on *CUMU_EFF* × *NO_INFO* (coef. = 0.136, t-stat. = 1.77). This result suggests that while changes in GAAP that inform managers affect acquisition decisions, the magnitude of this effect is statistically no different than that for changes in GAAP that are unlikely to inform managers. One potential reason for the weak evidence linking changes in GAAP to acquisitions via the information channel is that an important driver of acquisitions is the availability of a suitable target company that is reasonably valued. Since the value of the target (on a standalone basis) is unlikely to be affected by any new information that managers learn from complying with a change in GAAP, the information channel is likely of secondary importance with respect to the acquisition decisions.

## 5 Additional analyses and discussion

### 5.1 Cross-sectional test based on financing constraints

To further analyze the descriptive validity of the contracting hypothesis, I examine whether differences in the financing constraints of the borrower affect the relation between changes in GAAP and investment via the contracting channel. In the absence of financing frictions, a covenant violation caused by an accounting change should not have any economic consequences because it does not reflect changes in a firm's creditworthiness. However, financing frictions give rise to financing constraints, and financially constrained firms run the risk that if they violate a debt covenant, even if the violation is primarily due to a change in GAAP, their existing debt holders might extract rents in the renegotiation process because they (i.e., financially constrained firms) have few outside opportunities to refinance their debt. In other words, financially constrained firms are likely to face greater renegotiation costs in the event of a covenant violation (even those caused by a change in GAAP), and thus are more likely to take real actions to avoid covenant

violation. In contrast, financially unconstrained firms presumably have more demand for their debt from outside lenders, thereby increasing their bargaining power with existing lenders and lowering the cost of renegotiation in the event of a covenant violation induced by a change in GAAP. Thus, financially unconstrained firms are relatively less likely to take real actions to avoid covenant violations induced by changes in GAAP. As a result, I predict that the relation between changes in GAAP and investment via the contracting channel is stronger for financially constrained firms than for unconstrained firms.

To test this prediction, I partition the data into two groups based on their degree of financing constraints and re-estimate Eq. 3. I measure financing constraints using the Hadlock and Pierce (2010) size-age index. Firms above (below) the median value of the index are classified as financially constrained (unconstrained).

Table 7, Panel A (B, C, D) presents these results when *CAPEX* (*R&D*, *ACQ*, *TOTAL INVEST*) is the dependent variable. Each panel presents two regressions, one for the sample of constrained firms and another for the sample of unconstrained firms. My inferences are based on comparing (1) the coefficient on *CUMU_EFF* × *FLOATING_GAAP* across the two regressions, and (2) comparing the difference in the coefficient on *CUMU_EFF* × *FLOATING_GAAP* and *CUMU_EFF* × *NO_FLOATING_GAAP* in the same regression. Panel A shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is larger for financially constrained firms than for unconstrained firms (coefficient = 0.193 vs. 0.070), although the difference between these coefficients in marginally insignificant ($p$ value = 0.16).[24] Further, the table also shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is significantly larger than that on *CUMU_EFF* × *NO_FLOATING_GAAP* for the financially constrained firms but not for the financially unconstrained firms. These results (weakly) suggest that changes in GAAP affect Capex decisions via the contracting channel for financially constrained firms but not for financially unconstrained firms, which is consistent with the contracting hypothesis.

Table 7, Panel B presents the results when *R&D* is the dependent variable. The table shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is larger for financially constrained firms than for unconstrained firms, although the statistical significance of the difference is marginal (coefficient = 0.172 vs. 0.100; $p$ value for difference in coefficients = 0.105). Further, the table shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is significantly larger than that on *CUMU_EFF* × *NO_FLOATING_GAAP* for the financially constrained firms but not for the financially unconstrained firms. These results are consistent with the contracting hypothesis.

Similarly Table 7, Panel C presents the results when *ACQ* is the dependent variable. The table shows that the coefficient on

[24] Following Shroff et al. (2014), I test for the difference in coefficients across the two regressions using a bootstrap test. Specifically, I randomly assign each observation as being financially constrained and re-estimate Eq. 3 for these pseudo groups. I then compute the difference in coefficients on *CUMU_EFF* × *FLOATING_GAAP* for the two pseudo groups. Repeating this procedure 1000 times yields a null distribution of the difference in coefficients, which I use to test the significance of the difference in coefficients reported in Table 7.

**Table 7** Regression of investment on the cumulative effect and debt contract characteristics conditioned on financing constraints

| Dependent variable | Pr. sign | $CAPEX_t$ | | $p$ value for difference between (1) and (2) |
|---|---|---|---|---|
| | | (1) Constrained | (2) Unconstrained | |
| Panel A: Investment measured as capital expenditure | | | | |
| $CUMU\_EFF \times FLOATING\_GAAP_t$ | + | 0.193** | 0.070** | 0.159 |
| | | (*1.65*) | (*1.69*) | |
| $CUMU\_EFF \times NO\_FLOATING\_GAAP_t$ | ? | 0.019 | 0.050*** | 0.257 |
| | | (*0.87*) | (*3.11*) | |
| $FLOATING\_GAAP_t$ | | 0.010* | 0.008 | |
| | | (*1.85*) | (*0.87*) | |
| $CUMU\_EFF \times FLOATING\_GAAP$ = $CUMU\_EFF \times NO\_FLOATING\_GAAP$ ($p$ value) | | 0.058 | 0.659 | |
| Control variables and fixed effects | | Yes | Yes | |
| Clustered SE | | Industry and Year | Industry and Year | |
| Adjusted $R^2$ | | 0.68 | 0.55 | |
| Number of observations | | 1284 | 1230 | |
| Dependent variable | Pr. sign | $R\&D_t$ | | $p$ value for difference between (1) and (2) |
| | | (1) Constrained | (2) Unconstrained | |
| Panel B: Investment measured as R&D expenditure | | | | |
| $CUMU\_EFF \times FLOATING\_GAAP_t$ | + | 0.172** | 0.100 | 0.105 |
| | | (*1.96*) | (*0.50*) | |
| $CUMU\_EFF \times NO\_FLOATING\_GAAP_t$ | ? | −0.005 | 0.046 | 0.744 |
| | | (*−0.39*) | (*1.20*) | |
| $FLOATING\_GAAP_t$ | | 0.001 | 0.004 | |
| | | (*0.65*) | (*0.40*) | |

**Table 7** continued

| Dependent variable | Pr. sign | $R\&D_t$ | | $p$ value for difference between (1) and (2) |
|---|---|---|---|---|
| | | (1) Constrained | (2) Unconstrained | |
| *CUMU_EFF* × *FLOATING_GAAP* = *CUMU_EFF* × *NO_FLOATING_GAAP* ($p$ value) | | 0.020 | 0.795 | |
| Control variables and fixed effects | | Yes | Yes | |
| Clustered SE | | Industry and Year | Industry and Year | |
| Adjusted $R^2$ | | 0.91 | 0.81 | |
| Number of observations | | 716 | 565 | |
| Dependent variable | Pr. sign | $ACQ_t$ | | $p$ value for difference between (1) and (2) |
| | | (1) Constrained | (2) Unconstrained | |
| Panel C: Investment measured as acquisition expenditure | | | | |
| *CUMU_EFF* × *FLOATING_GAAP*$_t$ | + | 0.275** | 0.054 | 0.057 |
| | | (*1.83*) | (*0.31*) | |
| *CUMU_EFF* × *NO_FLOATING_GAAP*$_t$ | ? | 0.015 | 0.109** | 0.335 |
| | | (*0.58*) | (*2.07*) | |
| *FLOATING_GAAP*$_t$ | | 0.002 | −0.004 | |
| | | (*0.16*) | (*−0.50*) | |
| *CUMU_EFF* × *FLOATING_GAAP* = *CUMU_EFF* × *NO_FLOATING_GAAP* ($p$ value) | | 0.045 | 0.764 | |
| Control variables and fixed effects | | Yes | Yes | |
| Clustered SE | | Industry and Year | Industry and Year | |
| Adjusted $R^2$ | | 0.10 | 0.04 | |
| Number of observations | | 458 | 427 | |

**Table 7** continued

| Dependent variable | Pr. sign | *TOTAL INVEST*$_t$ | | *p* value for difference between (1) and (2) |
|---|---|---|---|---|
| | | (1) Constrained | (2) Unconstrained | |
| Panel D: Investment measured as the sum of capital expenditures, R&D, and acquisitions | | | | |
| *CUMU_EFF* × *FLOATING_GAAP*$_t$ | + | 0.141** | 0.053 | 0.318 |
| | | (*1.71*) | (*0.32*) | |
| *CUMU_EFF* × *NO_FLOATING_GAAP*$_t$ | ? | 0.054 | 0.088** | 0.520 |
| | | (*1.59*) | (*2.25*) | |
| *FLOATING_GAAP*$_t$ | | 0.011 | 0.023* | |
| | | (*0.79*) | (*1.71*) | |
| *CUMU_EFF* × *FLOATING_GAAP* = *CUMU_EFF* × *NO_FLOATING_GAAP* (*p* value) | | 0.115 | 0.839 | |
| Control variables and fixed effects | | Yes | Yes | |
| Clustered SE | | Industry and Year | Industry and Year | |
| Adjusted $R^2$ | | 0.43 | 0.32 | |
| Number of observations | | 1284 | 1230 | |

This table presents the results from regressing investment on its determinants, contract characteristics, and the cumulative effect conditioned on whether firm is financially constrained or unconstrained. Firm-years are classified as being financially constrained using the median value of the Hadlock and Pierce (2010) size-age index. The regressions include the control variables used in prior tables but the coefficients are suppressed. The t-statistics are reported in parentheses below the coefficients. All variables are defined in "Appendix 3". Continuous variables are winsorized at the 1 and 99%

***,**,* Statistical significance at the one (two) tail 1, 5, and 10% levels when I (do not) have a directional prediction

*CUMU_EFF* × *FLOATING_GAAP* is significantly larger for financially constrained firms than for unconstrained firms (coefficient = 0.275 vs. 0.054; *p* value for difference = 0.045). Further, the table also shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is larger than that on *CUMU_EFF* × *NO_FLOATING_GAAP* for the financially constrained firms but not for the financially unconstrained firms. Finally, Table 7, Panel D presents the results with *TOTAL INVEST* is the dependent variable. The panel provides the same qualitative inference as that in the earlier panels. However, statistical significance is not reached at conventional levels.

One potential reason for the insignificant results is that my cross-sectional tests have low power. Basically, only a subset of the firms in my sample have private debt contracts material enough to be covered in the Dealscan database. Further, an even smaller subset of these sample firms use floating GAAP, thereby leaving relatively few observations for partitions where *FLOATING_GAAP* equals one. Thus, when I partition the data into financially constrained and unconstrained firms, there are relatively few observations where *FLOATING_GAAP* equals one. Overall, the results in Table 7 support the hypothesis that the use of accounting numbers in contracts leads to an association between changes in GAAP and R&D and acquisitions, with weaker evidence for Capex decisions.

### 5.2 Persistence of relation between changes in GAAP and investment

My tests so far examine whether firms change their investment decisions in the year in which they adopt a new accounting standard, because this is first period in which (1) the cumulative effect affects debt covenants, and (2) managers learn new information after going through the process of complying with the new standard. Next, I examine whether the effect of changes in GAAP on investment persists into the future. The contracting and information hypotheses have different predictions about whether the effect of a change in GAAP will persist into the future, and thus this examination of the relation between changes in GAAP and future investment serves as an additional test of my main predictions.

Prior research (e.g., Roberts and Sufi 2009) finds that debt contracts are frequently renegotiated and that the vast majority of contracts are renegotiated within the first 3 years of their inception. Renegotiations that occur after the adoption of a new accounting standard likely incorporate the revised accounting rules when the terms of the revised contract are fixed. Thus the effect of changes in GAAP on investment via the contracting channel is unlikely to persist into the future. In contrast, any new information learned from complying with a new accounting rule is likely to have a persistent effect on investment. For example, if the adoption of SFAS 106 (postretirement benefits) provides managers with new information about the true cost of an employee, this new information about employee costs is likely to be relevant for future investment decisions.

To test the above predictions, I re-estimate Eqs. 2–4 after replacing the dependent variable with investment in period t + 1 (rather than t, which is the year of the accounting change). The measurement of the cumulative effect and control variables remains unchanged. Table 8 presents the results for all four dependent

**Table 8** Regression of investment one period after the adoption of the change in GAAP on its determinants, the cumulative effect, debt contract characteristics, and the likely informativeness of the change in GAAP

| Dependent variable | Pr. sign | $CAPEX_{t+1}$ | | | $R\&D_{t+1}$ | | | $ACQ_{t+1}$ | | | $TOTAL\ INVEST_{t+1}$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $CUMU\_EFF_t$ | + | 0.075** | | | 0.034*** | | | 0.041* | | | 0.057** | | |
| | | (*1.67*) | | | (*2.82*) | | | (*1.61*) | | | (*1.83*) | | |
| $CUMU\_EFF \times FLOATING\_GAAP_t$ | | | 0.029 | | | −0.111 | | | 0.156 | | | 0.098 | |
| | | | (*0.25*) | | | (*−0.91*) | | | (*1.37*) | | | (*0.77*) | |
| $CUMU\_EFF \times NO\_FLOATING\_GAAP_t$ | | | *0.094* | | | *−0.009* | | | *0.031* | | | *0.125** | |
| | | | (*1.31*) | | | (*−0.56*) | | | (*1.54*) | | | (*1.74*) | |
| $FLOATING\_GAAP_t$ | | | 0.002 | | | −0.001 | | | 0.002 | | | 0.004 | |
| | | | (*0.37*) | | | (*−0.30*) | | | (*0.22*) | | | (*0.69*) | |
| $CUMU\_EFF \times INFO_t$ | + | | | 0.097** | | | 0.053*** | | | 0.033** | | | 0.085** |
| | | | | (*1.96*) | | | (*5.41*) | | | (*1.71*) | | | (*2.21*) |
| $CUMU\_EFF \times NO\_INFO_t$ | | | | *−0.063* | | | *−0.026* | | | *−0.093* | | | *−0.149* |
| | | | | (*−1.03*) | | | (*−0.73*) | | | (*−1.28*) | | | (*−1.01*) |
| $CUMU\_EFF \times FLOATING\_GAAP = CUMU\_EFF \times NO\_FLOATING\_GAAP$ | | | 0.582 | | | 0.384 | | | 0.247 | | | 0.856 | |
| $CUMU\_EFF \times INFO = CUMU\_EFF \times NO\_INFO$ | | | | 0.011 | | | 0.011 | | | 0.029 | | | 0.004 |
| Clustered SE by Ind. and Year | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Control variables and fixed effects | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Number of observations | | 2619 | 2367 | 2619 | 1307 | 1213 | 1307 | 924 | 893 | 924 | 2619 | 2367 | 2619 |
| Adjusted $R^2$ | | 0.49 | 0.50 | 0.49 | 0.73 | 0.75 | 0.73 | 0.09 | 0.08 | 0.08 | 0.40 | 0.42 | 0.42 |

This table presents the results from regressing one period ahead investment on its determinants (as defined in the previous tables), the cumulative effect, debt contract characteristics and the likely informativeness of the change in GAAP. The t-statistics are reported in parentheses below the coefficients. All variables are defined in "Appendix 3". All continuous variables are winsorized at the 1 and 99% of their empirical distribution

***,**,* Statistical significance at the one (two) tail 1, 5, and 10% levels when I (do not) have a directional prediction

variables. The table shows that the main effect of *CUMU_EFF* is positive and significant in all regressions, irrespective of the dependent variable. This result indicates that changes in GAAP have a persistent effect on investment.

Next, the table shows that the coefficient on *CUMU_EFF* × *FLOATING_GAAP* is statistically insignificant in all regressions. Further, the difference between the coefficient on *CUMU_EFF* × *FLOATING_GAAP* and *CUMU_EFF* × *NO_FLOATING_GAAP* is also insignificant. These results suggest that changes in GAAP do not affect capex, R&D, or acquisitions via the contracting channel.

Finally, the table shows that the coefficient on *CUMU_EFF* × *INFO* is positive and statistically significant in all four regressions, irrespective of the dependent variable. In addition, the difference between the coefficient on *CUMU_EFF* × *INFO* and *CUMU_EFF* × *NO_ INFO* is also significant in all regressions, suggesting that changes in GAAP affect capex, R&D, acquisitions, and total investment via the information channel even in the period following the change in GAAP. Overall, the results in Table 8 suggest that changes in GAAP affect investment in the post-adoption years via the information channel but not via the contracting channel, consistent with my with hypotheses.

### 5.3 Accounting for postretirement benefits (SFAS 106) and investment

Thus far, my tests document an association between the cumulative effect of an accounting change and investment. As a result, the validity of my inferences depends on whether the cumulative effect serves as a reasonable proxy for the impact of an accounting change on firms' financial statements. If the cumulative effect is measured with error or somehow spuriously correlated with investment, my inferences could be affected. To mitigate concerns about potential measurement error in the cumulative effect driving my results, I devise a test around the adoption of SFAS 106 (accounting for postretirement benefits) that does not employ the cumulative effect in anyway. Specifically, I examine whether the adoption of SFAS 106 led firms to reduce their investment.

I focus on SFAS 106 because (1) the direction of its predicted impact on investment is reasonably unambiguous, (2) it affected a broad cross-section of firms, and (3) the heterogeneity in its impact on firms can be measured with reasonable precision. Elaborating on the first point, there is fairly robust anecdotal evidence that many firms underestimated the true cost of the postretirement benefits they promised their employees. As a result, firms complying with SFAS 106 likely learned that their employee costs are higher than they previously thought. My hypothesis predicts that new information about higher-than-anticipated employee costs should lead to a decrease in investment.

Second, the accounting change concerning postretirement benefits affected a large number of firms in the economy because postretirement benefits are part of employee compensation in most firms and the vast majority of these firms accounted for retirement benefits using a pay-as-you-go basis (i.e., cash basis) prior to SFAS 106 (see D'Souza et al. 2001). Lastly, SFAS 106 adoption required firms to record a liability called the "accumulated postretirement benefit obligation"—i.e., the present value of future benefits attributed to employee services performed up to a

**Table 9** Regression of changes in investment around the adoption of SFAS 106: accounting for postretirement benefits other than pensions

| Dependent variable | Pr. sign | $CAPEX_t$ | $R\&D_t$ | $ACQ_t$ | $TOTAL\ INVEST_t$ |
|---|---|---|---|---|---|
| Panel A: Static analyses around SFAS 106 adoption | | | | | |
| $POST_t$ | | 0.0002 | 0.0006 | 0.0005 | 0.0001 |
| | | (*0.55*) | (*1.48*) | (*0.45*) | (*0.17*) |
| $POST \times RETIRE\ OBLIGATION_t$ | – | −0.0001*** | −0.0046** | 0.0042 | −0.0001*** |
| | | (*−7.69*) | (*−2.22*) | (*0.40*) | (*−5.54*) |
| $TOBIN'S\_Q_{t-1}$ | | 0.0012*** | 0.0002 | 0.0016*** | 0.0023*** |
| | | (*6.69*) | (*1.04*) | (*3.61*) | (*5.21*) |
| $CFO_t$ | | 0.0160** | −0.0399*** | 0.0275* | −0.0234 |
| | | (*2.36*) | (*−6.06*) | (*1.66*) | (*−1.37*) |
| $CASH_{t-1}$ | | 0.0195*** | −0.0050 | 0.0633*** | 0.0592*** |
| | | (*4.16*) | (*−0.72*) | (*4.76*) | (*4.37*) |
| $GROWTH_{t-1}$ | | 0.0001 | −0.0009*** | −0.0007 | −0.0022*** |
| | | (*0.38*) | (*−3.10*) | (*−1.28*) | (*−3.28*) |
| $LEVERAGE_{t-1}$ | | −0.0086*** | −0.0016 | −0.0139*** | −0.0239*** |
| | | (*−7.89*) | (*−1.31*) | (*−5.01*) | (*−9.69*) |
| $MVE_{t-1}$ | | 0.0012*** | 0.0001 | −0.0003 | 0.0026*** |
| | | (*5.50*) | (*0.50*) | (*−0.57*) | (*5.27*) |
| $CAPEX_{t-1}$ | | 0.2327*** | | | |
| | | (*11.34*) | | | |
| $R\&D_{t-1}$ | | | 0.1701*** | | |
| | | | (*6.76*) | | |
| $ACQ_{t-1}$ | | | | −0.0469*** | |
| | | | | (*−2.99*) | |
| $TOTAL\ INVEST_{t-1}$ | | | | | 0.0817*** |
| | | | | | (*5.76*) |

**Table 9** continued

| Dependent variable | Pr. sign | $CAPEX_t$ | $R\&D_t$ | $ACQ_t$ | $TOTAL\ INVEST_t$ |
|---|---|---|---|---|---|
| Clustered SE | | Industry | Industry | Industry | Industry |
| Firm fixed effects | | Yes | Yes | Yes | Yes |
| Fiscal year fixed effects | | Yes | Yes | Yes | Yes |
| Number of observations | | 15,731 | 6824 | 4867 | 15,731 |
| Adjusted $R^2$ | | 0.61 | 0.89 | 0.26 | 0.50 |
| Dependent variable | Pr. sign | $CAPEX_t$ | $R\&D_t$ | $ACQ_t$ | $TOTAL\ INVEST_t$ |
| Panel B: Dynamic analyses around SFAS 106 adoption | | | | | |
| $POST\ [-2]_t$ | | 0.0007* | 0.0003 | −0.0001 | 0.0009 |
| | | (*1.69*) | (*0.60*) | (*−0.05*) | (*0.94*) |
| $POST\ [-1]_t$ | | 0.0012* | 0.0003 | −0.0016 | 0.0017 |
| | | (*1.81*) | (*0.34*) | (*−0.77*) | (*1.05*) |
| $POST\ [0]_t$ | | 0.0017* | 0.0011 | 0.0003 | 0.0022 |
| | | (*1.78*) | (*1.03*) | (*0.11*) | (*1.09*) |
| $POST\ [1]_t$ | | 0.0016 | 0.0017 | −0.0010 | 0.0026 |
| | | (*1.40*) | (*1.07*) | (*−0.36*) | (*1.03*) |
| $POST\ [2]_t$ | | 0.0022 | 0.0023 | −0.0002 | 0.0038 |
| | | (*1.63*) | (*1.35*) | (*−0.07*) | (*1.26*) |
| $POST\ [3+]_t$ | | 0.0024 | 0.0029 | 0.0006 | 0.0046 |
| | | (*1.56*) | (*1.56*) | (*0.16*) | (*1.38*) |
| $POST\ [-2] \times RETIRE\ OBLIGATION_t$ | 0 | 0.0000 | 0.0006 | 0.0140 | 0.0000 |
| | | (*1.08*) | (*0.25*) | (*1.12*) | (*0.79*) |
| $POST\ [-1] \times RETIRE\ OBLIGATION_t$ | 0 | −0.0000 | 0.0010 | 0.0097 | 0.0000 |
| | | (*−0.61*) | (*0.41*) | (*0.56*) | (*0.35*) |

**Table 9** continued

| Dependent variable | Pr. sign | $CAPEX_t$ | $R\&D_t$ | $ACQ_t$ | $TOTAL\ INVEST_t$ |
|---|---|---|---|---|---|
| *POST [0]* × *RETIRE OBLIGATION*$_t$ | – | −0.0001*** | −0.0032** | −0.0132 | −0.0001*** |
| | | (*−7.64*) | (*−1.71*) | (*−0.85*) | (*−4.96*) |
| *POST [1]* × *RETIRE OBLIGATION*$_t$ | – | −0.0001*** | −0.0049** | 0.0253 | −0.0001* |
| | | (*−5.24*) | (*−2.04*) | (*1.33*) | (*−1.54*) |
| *POST [2]* × *RETIRE OBLIGATION*$_t$ | – | −0.0000** | −0.0048* | 0.0183 | −0.0001*** |
| | | (*−1.87*) | (*−1.62*) | (*1.02*) | (*−2.90*) |
| *POST [3+]* × *RETIRE OBLIGATION*$_t$ | – | −0.0001*** | −0.0034* | 0.0131 | −0.0001** |
| | | (*−3.67*) | (*−1.25*) | (*0.85*) | (*−2.27*) |
| Clustered SE | | Industry | Industry | Industry | Industry |
| Control variables | | Yes | Yes | Yes | Yes |
| Firm fixed effects | | Yes | Yes | Yes | Yes |
| Fiscal year fixed effects | | Yes | Yes | Yes | Yes |
| Number of observations | | 15,731 | 6824 | 4867 | 15,731 |
| Adjusted $R^2$ | | 0.61 | 0.89 | 0.26 | 0.50 |

This table presents the results from regressing investment on its determinants, indicator variables for the post-SFAS 106 period, and the magnitude of the postretirement benefit liability in the initial year of SFAS 106 adoption. This regression exploits the staggered adoption of SAFS 106 by firms due to differences in their fiscal year ends to identify the treatment effect of SFAS 106 on investment. The t-statistics are reported in parentheses below the coefficients. All variables are defined in "Appendix 3". All continuous variables are winsorized at the 1 and 99% of their empirical distribution

***,**,* Statistical significance at the one (two) tail 1, 5, and 10% levels when I (do not) have a directional prediction

given yearly date. The accumulated postretirement benefit obligation helps me identify the exact year in which firms adopted SFAS 106 and provides a measure of the extent to which firms were affected by SFAS 106.

To test whether SFAS 106 affects investment decisions, while controlling for the concurrent changes in economic conditions and growth opportunities, I use a differences-in-differences design that exploits the staggered nature of SFAS 106 adoption resulting from differences in firms' fiscal year ends and in the adoption timing of the standard (i.e., early vs. late adoption). Specifically, I estimate regressions of the following form on a sample of observations 5 years before and after SFAS 106 adoption:

$$INVEST_{i,t} = \alpha_i + \alpha_t + \beta_1 POST_{i,t} + \beta_2 POST \times RETIRE\_OBLIGATION_i + \sum \lambda' CONTROLS + \varepsilon_{i,t} \quad (5)$$

In the equation above, *INVEST* is one of the four measures of investment: *CAPEX*, *R&D*, *ACQ*, or *TOTAL INVEST*. $\alpha_i$ ($\alpha_t$) are firm (year) fixed effects. *POST* is an indicator variable that equals one for fiscal years ending on and after the year in which SFAS 106 is adopted. *RETIRE OBLIGATION* is the accumulated postretirement benefit obligation as of the year in which the firm adopted SFAS 106. This variable captures cross-sectional differences in the impact of SFAS 106 on firms, and is time invariant since I measure it as of the first year of SFAS 106 adoption.

The coefficient of interest in the above equation is *POST* × *RETIRE OBLIGATION*, which captures the change in investment following SFAS 106 adoption. By including both firm and year fixed effects, the effect of SFAS 106 on investment is identified based on cross-sectional differences in (1) the year in which firms adopt SFAS 106, and (2) effect of SFAS 106 on firms. Since different firms adopted SFAS 106 in different years, the main effect of *POST* is identified in the regression above despite the inclusion of year-fixed effects. However, the main effect of *RETIRE OBLIGATION* is not identified, because it is constant for each firm and thus absorbed by the firm-fixed effects.

Table 9 presents the results. Consistent with my prediction, Panel A shows that the coefficient on *POST* × *RETIRE OBLIGATION* is negative and significant when the dependent variable is *CAPEX*, *R&D*, and *TOTAL INVEST*. These coefficients suggest that firms reduce their capital and R&D investment post-SFAS 106 adoption and that the reduction in investment is larger for firms that had larger postretirement benefit obligations. The table also shows that SFAS 106 adoption is unrelated to firms' acquisition expenditures. This result is also consistent with the evidence in earlier tests that suggests that accounting changes are less likely to affect acquisition decisions because they are more dependent on the value of the target and, as such, are less likely to be affected by new information learned about the acquirer's costs, including postretirement benefits.

In Panel B, I examine the dynamic effect of SFAS 106 adoption on investment by breaking down the *POST* variable into six indicator variables that capture the two years pre SFAS 106 adoption, the year of SFAS 106 adoption, and the three years post SFAS 106 adoption. I interact each of these six indicator variables with *RETIRE OBLIGATION*. Panel B shows that the coefficients on *POST [−2]* × *RETIRE OBLIGATION* and *POST [−1]* × *RETIRE OBLIGATION* are

insignificant in all four regressions, suggesting that firms do not change in their investment in the years preceding SFAS 106 adoption. However, the coefficients on *POST [0]* × *RETIRE OBLIGATION*, *POST [1]* × *RETIRE OBLIGATION*, *POST [2]* × *RETIRE OBLIGATION*, and *POST [3+]* × *RETIRE OBLIGATION* are all negative and significant in the regressions in which the dependent variable is *CAPEX*, *R&D*, and *TOTAL INVEST*. These results suggest that the effect of SFAS 106 on investment persists many years post adoption, which is consistent with the information hypothesis but not necessarily a contracting hypothesis or an alternative hypothesis related to growth opportunities. Overall, this test serves to show that changes in GAAP affect investment even if the accounting change is unrelated to the measurement and reporting of investment. Further, the persistence of the effect of SFAS 106 adoption on investment and the absence of a relation between SFAS 106 adoption and acquisition decisions are consistent with the information hypothesis. However, a limitation of this test is that it does not provide direct evidence on why the change in GAAP affects investment.

### 5.4 Endogeneity

The FASB allows firms flexibility in the timing and method of adoption of new accounting standards. Specifically, accounting rule changes can be adopted using a combination of four methods: prospective, retroactive, catch-up, and retroactive/catch-up (Balsam et al. 1995). Under the prospective method, the accounting change is adopted prospectively and affects only current and future periods' financial results. The retroactive method requires that all prior years' financial statements presented as comparative income statements/balance sheets be restated to reflect the accounting change (to the extent such computation is possible). Under the catch-up approach, the prior-period effects of changes in GAAP are recognized as the "cumulative effect of an accounting change" in the current period's income statement. Lastly, the retroactive/catch-up approach requires firms to include the cumulative effect of an accounting change in the earliest year's comparative income statement, presented along with the current period's income statement.[25]

A large literature on "accounting choice" shows that contracting and market incentives influence managers' accounting choices, including the method and timing of adoption of new standards (see Fields et al. (2001) for a review of the literature). Thus, when firms have a choice whether to use the catch-up method to adopt new accounting rules, this choice could be correlated with managerial incentives to invest. Even when GAAP does not explicitly provide choice in the method of adopting new accounting rules, *CUMU_EFF* could be affected by managerial discretion. I address this concern in the following ways. First, I control for accounting standard fixed effects in my statistical tests. These fixed effects help filter out idiosyncratic effects of changes in GAAP on investment. Since managerial incentives and the discretion allowed by a change in GAAP vary for each new

[25] Under Accounting Principles Board Opinion No. 20—the accounting rule governing changes in GAAP prior to 2005—most accounting changes were implemented using the catch-up method. For fiscal years beginning after December 15, 2005, SFAS 154 governs the accounting for transition adjustments due to changes to GAAP.

pronouncement, my inferences are less likely to be driven by un-modeled managerial incentives that are idiosyncratic to a standard when I control for accounting standard fixed effects.

Second, I examine the robustness of my results to dropping firms that are early adopters of a standard, to including year fixed effects, and to using an indicator variable for early adopters. To the extent incentives to adopt standards early are correlated with incentives to alter investment, my results could be biased. However, I find that my results are unaffected in all of the above tests. Note that the managerial incentives that drive accounting choices around changes in GAAP have to be correlated with the incentives that influence managerial investment decisions in order to affect my tests. For example, the incentives to report large positive cumulative effects need to be correlated with incentives to increase investment to affect my tests. To the extent this is improbable, my inferences are unlikely to change due to any endogeneity bias.

Notwithstanding the above arguments, note that only five of the major changes in GAAP in my sample allowed choice in the method of adopting the standard, and my results are robust to dropping these changes in GAAP from my analyses. Further, in most cases, the managerial incentives at play are likely to bias my tests towards the null hypothesis of no relation between changes in GAAP and investment. For example, Beatty and Weber (2006) find evidence that contracting incentives created by the presence of debt covenants cause firms to postpone goodwill impairments rather than immediately book a below-the-line expense upon the adoption of SFAS 142 (Accounting for Goodwill). Further, they show that firms with covenants record smaller cumulative effects relative to firms without covenants. Their results suggest that firms with large negative (positive) cumulative effects are less (more) likely to have private debt covenants to begin with, which biases my tests towards the null of no relation between changes in GAAP and investment. However, to the extent the above arguments do not address endogeneity or other concerns, my results could be affected.

Another potential identification concern arises because accounting changes are endogenously determined by changes in the economic environment of the firm. Hence, an alternative hypothesis is that changes in GAAP are the outcome of, or occur simultaneously with, changes in investment opportunities, thereby causing changes in investment. While such a hypothesis is plausible, I question its veracity for the following reasons. For my inferences to be affected by such endogeneity, the magnitude and sign of the impact an accounting change has on firms' financial statements would also have to be correlated with changes in firms' investing environments in the same direction. Further, this endogenous effect would have to persist across the many different accounting changes in my sample. However, prior research suggests that the factors leading up to each of these standards were significantly different from each other. For example, Ramanna (2008) shows that SFAS 142 was issued in response to political pressure over the abolition of pooling-of-interest accounting; Bens and Monahan (2008) suggest that FIN 46 was issued in response to the Enron scandal; and SAB 101 was issued over concerns that firms manipulate revenue recognition to manage earnings (Altamuro et al. 2005). Thus, it seems unlikely that the endogenous relation between changes in GAAP and firms' economic environments is the primary driver of my results.

### 5.5 Discussion of potential alternative explanations

In this section, I discuss potential alternative interpretations of the results. First, a potential concern is that changes in GAAP have a mechanical effect on my investment variables because both the cumulative effect and the investment variables are ultimately computed in accordance with GAAP. My tests suggest that mechanical effects are unlikely to explain my results, because the relation between the cumulative effect and investment varies in a predictable manner based on (1) whether debt contracts have floating or fixed GAAP and (2) the extent of the financing constraints of the firm. In addition, I test and find that the cumulative effect is associated with one period ahead investment too. If this relation were truly mechanical, then we wouldn't see such variation in the relation between the cumulative effect and investment.

Second, it is plausible that changes in GAAP reduce the information asymmetry between managers and shareholders, which enables shareholders to monitor managers and improve/affect their investment decisions. I attempt to separate out my hypotheses from the monitoring hypothesis by controlling for changes in information asymmetry between shareholders and managers in my empirical analyses (untabulated). I proxy for changes in information asymmetry between managers and shareholders using changes in the profitability of insider traders (Jagolinzer et al. 2011) and changes in accrual quality (Dechow and Dichev 2002), and find that my inferences are unaffected by these control variables. Nevertheless, I acknowledge that this alternative mechanism might induce a relation between changes in GAAP and investment.[26]

Third, it is plausible that changes in GAAP lead to changes in information asymmetry and the firm's cost of capital, which in turn affects investment. While I cannot rule out such a hypothesis, I find that my results are robust to controlling for the changes in corporate transparency using the Dechow and Dichev (2002) measure, and to controlling for the cost of capital using available proxies such as current and future stock returns and bid-ask spreads (untabulated). Further, note that if the change in disclosures caused by the change in GAAP did indeed reduce firms' cost of capital, then it is likely that firms would have voluntarily disclosed such information to the avail of the cost-of-capital benefit. That is, it is unclear why firms would wait for an accounting mandate if they know that the additional disclosure is likely to reduce their cost of capital. Nevertheless, I acknowledge that accounting changes might affect the cost of capital and, hence, firms' investment decisions.

Finally, it is plausible that the relation between changes in GAAP and investment is the result of changes in the information reported in financial statements. Since the information reported in financial statements affects investor perceptions, managerial compensation, and a number of other factors that affect managerial utility, managers pay close attention to financial statements (i.e., this information is more salient). As a result, it is plausible that the information reported on financial statements is more heavily

[26] It is also noteworthy that the changes in GAAP that are likely to inform managers (in my sample) allow managers considerable reporting discretion. When managers have financial reporting discretion, if they perceive that shareholders are likely to "punish" them for some of their actions that are required to be disclosed under the new accounting regime, managers are likely to use the reporting discretion to obfuscate their actions. Therefore, accounting standards that allow managers considerable reporting discretion limit the extent to which they facilitate shareholder monitoring.

weighted by managers in their decision making (e.g., Graham et al. 2016). While such an alternative hypothesis is plausible, my results suggest that the relation between changes in GAAP and investment is limited to those standards that are likely to inform managers, which is inconsistent with the salience hypothesis. In spite of the arguments above and my attempts to control for the alternatives, I concede that the hypotheses described above are viable alternative mechanisms through which changes in GAAP affect investment.

## 6 Concluding remarks

My main objective in this study is to investigate whether changes in financial accounting rules affect corporate investment decisions and to examine the mechanisms through which this economic consequence manifests. Using a hand-collected sample containing 49 changes in GAAP, I find evidence suggesting that changes in accounting rules affect investment even when the accounting change is unrelated to the measurement and financial reporting of investment. Further analyses reveal that changes in GAAP affect investment because financial accounting numbers are used in debt contracts, which do not fully accommodate the GAAP changes. Further, I find that this relation is stronger for financially constrained firms.

Finally, I examine a novel reason why changes in accounting rules might affect investment. I suggest that accounting changes alter managers' information sets, which affects the NPV estimates of their investments and consequently the quantity and quality of their investment decisions. I provide initial evidence supporting this hypothesis. This paper contributes to the literature on the real effects of accounting by providing evidence that financial accounting rules affect investment decisions and by documenting two mechanisms through which the relation manifests.

In conclusion, I highlight an important limitation of this study. The majority of my tests are based on the cumulative effect of an accounting change being a reasonable proxy for the impact an accounting change has on firms' financial statements. However, not all standards require firms to book a cumulative effect of accounting change, thereby limiting the changes in GAAP in my sample. Further, even the changes in GAAP that do require firms to book a cumulative effect typically allow firms discretion related to the method of adoption. Finally, the cumulative effect of an accounting change is an accrual and thus is subject to managerial manipulation. In summary, if the cumulative effect of an accounting change is not a valid proxy for the impact of accounting changes on firms' financial statements, then my inference could be affected.

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## Appendix 1: Identifying changes in GAAP that are likely to inform managers

Hypothesis 3 predicts that some accounting changes can inform managers and facilitate their investment decisions. A crucial component of this test is identifying which changes in GAAP are more or less likely to inform managers. I discuss my identification choices for the 13 standards that were adopted by at least 25 firms in my sample. Collectively, these 13 standards comprise more than 95% of my sample. To identify standards more likely to inform managers, I examine whether the change in GAAP increased the amount of accrual accounting estimates and judgments that managers are required to make, and whether compliance with the standard is likely to require the services of an outside expert (e.g., actuary or appraiser). Managers require information to arrive at reasonable estimates of the numbers reported in public financial statements. Therefore, standards that require managers to compute more estimates and exercise more judgment are more likely than others to require managers to collect and process additional information, and thus more likely to inform managers.[27]

| Reporting rule | Classification | Discussion of the accounting standard classification choices |
|---|---|---|
| SFAS No. 106: accounting for postretirement benefits other than pensions | Informative | SFAS 106 establishes accounting standards for employers' accounting for postretirement benefits other than pensions. Prior to SFAS 106, accounting for postretirement benefits was primarily accounted for on a pay-as-you-go (cash) basis. SFAS 106 required firms to accrue the expected cost of providing future benefits to an employee over the years that the employee renders service. The change required firms to compute the expected duration for which an employee will serve the company, the future cost of providing promised benefits, the expected life of the employee post retirement, etc.[a] These calculations likely provided managers with richer and more accurate information about the cost of promised benefits and, more generally, the cost of an employee's service. Any re-evaluation of employee costs is likely to have been factored into investment decisions, as it directly affects the net present value of the investment. Anecdotal evidence supports the argument that managers hired outside experts and learned new information about the cost of postretirement benefits. For example, a *Business Week* article entitled "First Thing We Do is Kill the Accountants" quotes FASB project manager Diana J. Scott as saying, "We are absolutely appalled. They [employers] honestly weren't measuring this. In some cases they didn't even know whom they were covering as dependents. Employers are finding they promised much more than they can give" (September 12, 1988, p. 4) |

[27] See "Appendix 2" for a validation test of my classification procedure.

| Reporting rule | Classification | Discussion of the accounting standard classification choices |
|---|---|---|
| SFAS No. 109: accounting for income taxes | Informative | SFAS 109 required firms to recognize deferred tax liabilities (assets) for all taxable (deductible) temporary differences (and operating loss and tax credit carry forwards). Further, based on the available evidence, deferred tax assets should be reduced by a valuation allowance to amounts more likely than not to be realized in future tax returns. The realization of deferred tax assets depends primarily on the existence of sufficient taxable income of appropriate character. Such taxable income is generated from (1) reversal of existing taxable temporary differences, (2) any future taxable income exclusive of reversing temporary differences, (3) taxable income in carry back years, and (4) tax-planning strategies (see Miller and Skinner 1998). Considering future economic events in assessing the likelihood of realizing the deferred tax asset is a unique provision of SFAS 109, and Ayers (1998) shows that this information is value-relevant to investors. The information necessary to estimate future tax consequences of current transactions could potentially provide managers with better estimates of marginal tax rates and, hence, affect investment decisions |
| SFAS No. 112: accounting for post-employment benefits | Informative | SFAS 112 establishes accounting standards for employers who provide benefits to former or inactive employees after employment but before retirement. This statement requires firms to recognize the cost of postemployment benefits on an accrual basis (when it can be reasonably estimated). Prior to this statement, employers' accounting for the cost of postemployment benefits varied. Some employers accrued the estimated cost of those benefits over the related service periods of active employees; other employers recognized the cost of postemployment benefits when they were paid (cash basis). Employers using the cash basis of accounting for postemployment benefits likely required more information to obtain reasonable accrual estimates. Hence, this statement potentially created information for firms who used the cash basis of accounting for postemployment benefits.[b] The arguments parallel that for SFAS 106 |
| SFAS No. 115: accounting for certain investments in debt and equity securities | Not informative | SFAS 115 addresses the accounting for investments in equity securities that have readily determinable fair values and for all investments in debt securities. This standard did not require the collection of any new information; rather, it required firms to classify securities into three groups—held-to-maturity, available-for-sale, and trading securities—depending on the intent of purchase |

| Reporting rule | Classification | Discussion of the accounting standard classification choices |
|---|---|---|
| EITF 97-13: accounting for consulting contracts, business process reengineering and IT transformation | Not informative | EITF 97-13 concerns accounting for costs incurred in connection with a consulting contract or an internal project that combines business process reengineering and information technology transformation. Prior to this rule, the reporting practices of various firms were mixed. Some firms capitalized the cost associated with business process reengineering, while other firms expensed them. This accounting change required firms to expense the cost of business process reengineering activities as incurred. Expensing the cost of an activity is unlikely to require additional information collection. Rather, in most cases, expensing an item that was previously capitalized simply amounts to removing the item from the balance sheet and including it in the income statement. Hence, the adoption of this rule is unlikely to generate decision-facilitating information for managers |
| SOP 98-5: reporting on the costs of start-up activities | Not informative | Prior to SOP 98-5 some companies were expensing start-up costs, while other companies were capitalizing them, using a variety of periods over which to amortize the costs. The disparate treatment of these costs diminished the comparability of companies' financial statements. This standard sought to bring uniformity to the treatment of start-up and organization costs by dictating that these costs be expensed as incurred. Similar to the reasoning discussed for EITF 97-13, expensing such costs is unlikely to provide managers with information to facilitate investment |
| SAB 101: revenue recognition in financial statements | Not informative | This statement required that revenue should not be recognized until it is realized or realizable and earned. For revenue to be realized or realizable and earned, there should be persuasive evidence that an arrangement exists, delivery should have occurred or services should be rendered, the seller's price to the buyer should be fixed or determinable, and collectability should be reasonably assured. The primary result of this statement was to postpone revenue recognition until a higher verifiability threshold had been met. Since managers are less likely to gain knowledge about the cash flow stream from a higher verifiability threshold, this standard is less likely to provide managers with new information. In fact, Altamuro et al. (2005) find that the associations between earnings and future cash flows and between unexpected earnings and earnings announcement period returns declined after the adoption of SAB 101, suggesting that there might have been a loss in earnings informativeness |

| Reporting rule | Classification | Discussion of the accounting standard classification choices |
|---|---|---|
| SFAS No. 133/138: accounting for derivative instruments and hedging activities | Not informative | This statement requires that an entity recognize all derivatives as either assets or liabilities in the statement of financial position and measure those instruments at fair value. If certain conditions are met, a derivative may be specifically designated as a hedge. When an entity applies hedge accounting, changes in the fair value of the derivative instrument can be offset with changes in the fair value of the asset/liability being hedged. Before the issuance of this statement, many derivatives were "off balance sheet" because, unlike conventional financial instruments such as stocks and bonds, derivatives often reflect at their inception only a mutual exchange of promises with little or no transfer of tangible consideration. Although SFAS 133 and 138 substantially changed accounting for derivatives, I do not expect this rule change to provide managers with new information. First, derivative instruments often have readily available market prices that are used to determine the value of the derivative assets or liabilities and do not require managers to make any estimates. Further, choosing the appropriate derivative instrument, whether for speculation or for hedging, requires reasonable prior understanding of the associated risks and payoffs. Recognizing derivatives on financial statements is unlikely to change a manager's ability to assess the risks and payoffs from investing in derivative instruments |
| SFAS No. 142: goodwill and other intangible assets | Informative | This standard addresses accounting for acquired goodwill and other intangible assets. Prior to this standard, goodwill and other intangibles were amortized over an arbitrary period, with an arbitrary ceiling of 40 years even if the asset had an indefinite life. This standard required firms to do away with amortization of assets with indefinite lives and to conduct impairment tests at least annually. Impairment tests require firms to compare the book value of net assets to the fair value of the related operations. To get a reasonable estimate of the fair value, firms are likely to need information about the expected future cash flows generated from the assets and the risk associated with those expected cash flows (as outlined in Statement of Financial Accounting Concepts 7, Using Cash Flow Information and Present Value in Accounting). Such an activity has the potential for providing managers with new information useful for evaluating investment decisions. Although number of studies show that managers use the discretion allowed by SFAS 142 opportunistically (e.g., Ramanna and Watts 2012), such behavior is not indicative of whether the internal estimates of the value of goodwill used by managers improved or worsened. To the extent managers fear litigation risk, they are more likely to back their estimates of the value of goodwill with more information after the adoption of SFAS 142 than before, even if they do not disclose the information in financial statements. Further, anecdotal evidence suggests that firms often hire appraisers to conduct impairment tests and comply with this standard |

| Reporting rule | Classification | Discussion of the accounting standard classification choices |
|---|---|---|
| SFAS No. 143: accounting for asset retirement obligations | Informative | SFAS 143 established accounting standards for the recognition and measurement of obligations attributable to the removal of assets as well as to their associated restoration costs. Since the obligation must be recorded at fair value and an active market for these obligations generally does not exist, the company must use the expected present value technique outlined in Statement of Financial Accounting Concepts 7, Using Cash Flow Information and Present Value in Accounting, which results in measuring the asset's and related liability's present value by using each company's credit-adjusted rate. Inherent in the calculation of the obligation and its related asset cost are numerous assumptions and judgments, including the estimated life of the property to be retired, settlement amounts, inflation factors, credit-adjusted discount rates, timing of settlement, and changes in the legal, regulatory, and environmental landscapes. These assumptions and judgments require the assimilation of information that likely also helps firms re-evaluate investment decisions. And anecdotal evidence indicates that compliance with this standard usually requires the help of outside experts |
| FIN 47: accounting for conditional asset retirement obligations | Informative | This interpretation clarifies the term "conditional asset retirement obligation" as used in SFAS 143. Many companies concluded that SFAS 143 did not apply to "conditional" asset retirement obligations (AROs). "Conditional" is defined by the FASB as "the legal obligation to perform an asset retirement activity in which the timing and/or method of settlement is conditioned on a future event that may not be in the control of the entity." FIN 47 was promulgated to clarify the term "conditional," as used in SFAS 143. FIN 47 makes it clear that if a company has sufficient information to reasonably estimate the fair value of an ARO, it must so recognize at the time the liability is incurred, even if the timing for the retirement of the asset remains uncertain. For example, if a building is purchased by an entity that eventually must meet certain environmental cleanup regulations, the entity must record those cleanup costs when the asset is acquired and as soon as the costs for cleanup may be estimated. Effectively, FIN 47 requires that companies disaggregate their environmental liabilities by placing these liabilities on the balance sheet before they become certainties, so that shareholders can get a better sense of the company's value. According to FIN 47, an asset is reasonably estimable if: (1) it is evident that the fair value of the obligation is embodied in the acquisition price of the asset; (2) an active market exists for the transfer of the obligation; or (3) sufficient information exists to apply an expected present value technique. There is "sufficient information" available to reasonably estimate the cost of an ARO when a settlement date is known or the date or method of settlement is reasonably estimable. If there is not sufficient information available, an ARO is not recognized, but the entity still must submit a report with its financial statement detailing why there is not sufficient information available. Given the amount of judgment and estimation required by this pronouncement, I classify this interpretation as providing information. In essence this statement expanded the scope of SFAS 143, and the arguments for why this statement might be informative to managers parallel those for SFAS 143 |

| Reporting rule | Classification | Discussion of the accounting standard classification choices |
|---|---|---|
| FIN 46/46r: consolidation of variable interest entities | Not informative | Accounting Research Bulletin (ARB) 51—Consolidated Financial Statements—requires that an enterprise's consolidated financial statements include subsidiaries in which the enterprise has a controlling financial interest. That requirement has usually been applied to subsidiaries in which an enterprise has a majority voting interest, but in many circumstances the enterprise's consolidated financial statements do not include variable interest entities with which it has similar relationships. This statement was issued because the voting interest approach is not effective in identifying controlling financial interests in entities that are not controllable through voting interests or in which the equity investors do not bear the residual economic risks. This statement spells out the conditions under which an entity should be consolidated. Since the specific criteria to consolidate do not require extensive information collection, managerial judgments, or estimates, I do not expect this standard to inform managers about investment |
| SFAS No. 123R: share-based payment (revised) | Not informative | This statement requires a public entity to measure the cost of employee services received in exchange for an award of equity instruments based on the grant-date fair value of the award (with limited exceptions). That cost is recognized over the period during which an employee is required to provide service in exchange for the award—the requisite service period (usually the vesting period). This statement eliminates the alternative to use Opinion 25's intrinsic value method of accounting that was provided in Statement 123 as originally issued. Under Opinion 25, issuing stock options to employees generally resulted in recognition of no compensation cost. Since SFAS 123 already required firms to disclose the fair value of equity-based compensation, implementation of SFAS 123R is unlikely to provide managers with information to facilitate investment decisions. Choudhary (2011) argues that the manners in which fair value estimates of stock option expense are computed under SFAS 123 and SFAS 123R are very similar. Specifically, she states that "[t]he valuation method of fair value (Black–Scholes) is applied consistently across both regimes." |

[a] Amir (1993) shows that investors underestimated the full consequences of postretirement benefits promised by firms prior to the introduction of SFAS 106. He goes on to shows that disclosures required by SFAS 106 are value-relevant and help investors compute a more accurate value of the cost of postretirement benefits

[b] Firms already using the accrual basis of accounting for postemployment benefits are likely to have smaller transition obligations from adopting this standard. Since I use the transition obligation to measure the impact of a standard on the firm, the fact that some firms already used the accrual method is unlikely to be a cause for concern

## Appendix 2: Stock returns-based test to validate the classification of accounting standards into "informative" and "uninformative" groups

Hypothesis 3 predicts that some accounting changes can inform managers and facilitate their investment decisions. A crucial component of this test is identifying which changes in GAAP are more or less likely to inform managers. In order to validate my classification of which changes in GAAP are more or less likely to inform managers, I perform the following test: I regress annual stock returns on the change in annual earnings and the cumulative effect of an accounting change, split into those arising from accounting standards that are likely to be informative and uninformative to managers. *RET* is the 12-month cumulative stock return for fiscal year t. The 12-month interval begins three months following the end of fiscal year t − 1 and ends three months after the end of fiscal year t. *ΔEARN* is defined as the change in earnings before extraordinary items (IB) for fiscal year t, scaled by market value of equity at the end of fiscal year t − 1. *CUMU_EFF* (ACCHG) is the cumulative effect of an accounting change as reported in the income statement, scaled market value of equity at the end of fiscal year t − 1. *INFO* is an indicator variable that takes on the value of one for observations in which the firm adopted an accounting standard that is likely to inform managers. It takes on the value of zero otherwise. The accounting standards classification is described in "Appendix 1". *NO_INFO* is an indicator variable that takes on the value of one (zero) if Information equals zero (one).

| Dependent variable | Pr. sign | $RET_t$ |
|---|---|---|
| *Intercept* | | 0.070*** |
| | | (*3.35*) |
| $\Delta EARN_t$ | + | 0.253*** |
| | | (*6.94*) |
| $CUMU\_EFF \times INFO_t$ | + | 0.306*** |
| | | (*5.05*) |
| $CUMU\_EFF \times NO\_INFO_t$ | ? | −0.638 |
| | | (−*0.49*) |
| $INFO_t$ | ? | 0.073*** |
| | | (*2.80*) |
| Number of observations | | 2777 |
| Adjusted $R^2$ | | 0.04 |

In this table, the t-statistics are computed using heteroskedasticity robust standard errors and are reported in parentheses. All continuous variables are winsorized at the 1 and 99% of their empirical distribution

***,**,* Statistical significance at the two tailed 1, 5, and 10% levels, respectively

## Appendix 3: Variable definitions

| Variable name | Variable definitions with Compustat or CRSP codes in parentheses |
|---|---|
| *ACQ* | *ACQ* (AQC) is the costs incurred during the year that relate to acquisitions, deflated by average assets in period t and t − 1 |
| *AGE* | *AGE* is the natural logarithm of the difference between the first year the firm enters Compustat and the current year. |
| *CAPEX* | *CAPEX* (CAPX) is the cash outflow or the funds used for additions to the company's property, plant, and equipment, excluding amounts arising from acquisitions, reported in the Statement of Cash Flows, deflated by average assets in period t and t − 1 |
| *CASH* | *CASH* (CHE) is cash and all securities readily transferable to cash, deflated by average assets in period t and t − 1 |
| *CFO* | *CFO* (OANCF) is cash flows from operations reported in the statement of cash flows, deflated by average assets in period t and t − 1 |
| *COVENANT/NO_COVENANT* | *COVENANT* is an indicator variable that takes on the value of one (zero) if the observation has (does not have) at least one financial covenant that is likely to be affected by the cumulative effect of an accounting change. *NO_COVENANT* is an indicator variable that takes on the value of one (zero) if *COVENANT* equals zero (one). |
| *CUMU_EFF* | *CUMU_EFF* (ACCHG) is the cumulative effect of an accounting change as reported in the income statement, deflated by average assets in period t and t − 1. It represents the effect of company adjustments due to accounting changes on prior period earnings. |
| *DEALSCAN* | *DEALSCAN* is an indicator variable that takes on the value of one (zero) if the firm has (does not have) data available in the Dealscan database for year t. |
| *DISCLOSE_RECON* | Indicator variable that equals one (zero) if the debt contract requires the firm to reconcile and disclose differences in financial ratios after changes in GAAP while renegotiating covenants. |
| *FIXED_GAAP_CONT, HYBRID_GAAP_CONT, FLOATING_GAAP_CONT* | *FIXED_GAAP_CONT* (*HYBRID_GAAP_CONT*; *FLOATING_GAAP_CONT*) is an indicator variable that takes on the value of one (zero) if the debt contract is based on Fixed GAAP (Hybrid GAAP; Floating GAAP). The Fixed GAAP practice excludes all changes to GAAP including mandatory accounting changes once the debt contract is signed. The Hybrid GAAP gives lenders and borrowers a mutual option to freeze GAAP at any point in time. The Floating GAAP practice uses the most up-to-date version of GAAP to determine compliance with the terms of the contract. |

| Variable name | Variable definitions with Compustat or CRSP codes in parentheses |
|---|---|
| *FLOATING_GAAP/ NO_FLOATING_GAAP* | *FLOATING_GAAP* is an indicator variable that takes on the value of one if the debt agreement has a covenant and uses the Floating GAAP practice or requires the firm to disclose reconciliations between the old and new accounting practice while renegotiating covenants to adjust for the change in GAAP. *NO_FLOATING_GAAP* is an indicator variable that takes on the value of one (zero) if *FLOATING_GAAP* equals zero (one). I hand collect this information from the debt contracts of my sample firms. Firm-years without debt contracts in the Dealscan database are assumed to have no private debt contract and thus *FLOATING_GAAP* (*NO_FLOATING_GAAP*) equal to zero (one). |
| *GROWTH* | *GROWTH* is the change in total assets (AT) from period t − 1 to period t scaled by total assets (AT) in period t − 1 |
| *INFO/NO_INFO* | *INFO* is an indicator variable that takes on the value of one for observations in which the firm adopted an accounting standard that is likely to inform managers about current or future investment opportunities. It takes on the value of zero otherwise. The accounting standards classification is described in "Appendix 1". *NO_INFO* is an indicator variable that takes on the value of one (zero) if *INFO* equals zero (one) |
| *LEVERAGE* | *LEVERAGE* is the sum of short-term debt (DLC) and long-term debt (DLTT), deflated by average assets in period t and t − 1 |
| *MVE* | *MVE* is the natural logarithm of the stock price (PRCC_F) times the number of shares outstanding (CSHO) measured at the end of the fiscal year |
| *POST* | An indicator equal to one for the fiscal years following SFAS 106 adoption |
| *POST [−2]* | An event time indicator equal to one for the fiscal year ending two years preceding the period in which a firm adopts SFAS 106 |
| *POST [−1]* | An event time indicator equal to one for the fiscal year ending immediately preceding the year in which a firm adopts SFAS 106 |
| *POST [0]* | An event time indicator equal to one for the fiscal year in which a firm adopts SFAS 106. |
| *POST [1]* | An event time indicator equal to one for the fiscal year ending immediately following the year in which a firm adopts SFAS 106 |
| *POST [2]* | An event time indicator equal to one for the fiscal year ending two years following the period in which a firm adopts SFAS 106 |
| *POST [3+]* | An indicator equal to one for the fiscal years ending three or more years following the period in which a firm adopts SFAS 106. |
| *R&D* | *R&D* (XRD) is the costs incurred during the year that relate to the development of new products or services, deflated by average assets in period t and t − 1 |
| *RETIRE OBLIGATION* | *RETIRE OBLIGATION* is the present value of future benefits attributed to employee services performed up to a given yearly date, measured in the year in which the firm adopted SFAS 106 (as a result this variable is time invariant) |
| *TOBIN'S_Q* | *TOBIN'S_Q* is measured as the sum of market value of equity (PRCC_F × CSHO), short-term debt (DLC) and long-term debt (DLTT) divided by total assets (AT) |
| *TOTAL INVEST* | The sum of acquisition expenditures (ACQ), capital expenditures (CAPX), and research and development expenditure (XRD), deflated by average assets in the period t and t − 1 |

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