Why do managers avoid EPS dilution? Evidence from debt-equity choice

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Abstract Survey evidence reveals that managers prefer to avoid dilution of earnings per share (EPS), though financial theory suggests it is irrelevant in firm valuation. We explore contracting and behavioral explanations for this apparent paradox using a large sample of debt-equity issuers. We first provide evidence that firms with greater agency conflicts between managers and shareholders are more likely to use EPS as a performance measure in bonus contracts. After controlling for possible endogeneity related to compensation contract design, we find that managers are more likely to avoid earnings dilution when their bonus compensation explicitly depends upon EPS performance. This effect is increasing in the magnitude of bonus compensation for this subset of firms; we document no such associations for the firms that do not use EPS in setting bonus pay. Additional tests of firms' speed of adjustment to target leverage ratios and firms' debt conservatism levels indicate that explicitly rewarding executives on EPS performance helps to resolve underleveraging problems. We also find that clientele effects are associated with managers' aversion to earnings dilution. Our findings provide a deeper understanding of the factors that underlie the use of accounting performance in compensation contracts and new evidence on the implications of the contracting role of accounting in firm decision-making.

Keywords Earnings per share (EPS) • Dilution • Executive compensation • Debt-equity financing • Agency conflicts

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1 Introduction

A half century of corporate finance theory suggests that earnings dilution should be irrelevant in firm valuation (Modigliani and Miller 1958; Brealey et al. 2007), yet survey evidence presented by Graham and Harvey (2001) reveals that CFOs regard earnings dilution as the single most important factor in determining whether to issue equity.[1] To quote Graham and Harvey (2001, p. 229):

> "The popularity of this response is intriguing. It either indicates that executives focus more than they should on earnings dilution (if the standard textbook view is correct), or that the standard textbook treatment misses an important aspect of earnings dilution."

In this paper, we explore contracting and behavioral explanations for this apparent paradox. In particular, we note that executives' annual bonus compensation contracts are frequently based on earnings per share (EPS) performance. For example, Kim and Yang (2010) document that EPS is the most common financial performance measure used in determining bonus compensation in S&P 500 firms, with almost half of all firms relying on EPS in setting bonus pay, and Ittner et al. (1997) report similar findings for a more diverse sample of firms. This situation creates strong incentives for executives to fixate on reported EPS, and we thus focus our main analysis on examining the contracting role of EPS in explaining managers' debt-equity choices.

In developing well-specified tests of the contracting hypothesis, however, an additional question naturally arises: Why do firms choose to explicitly reward executives on EPS performance rather than other performance measures? While considerable research has been devoted to examining the relative weights placed on different performance measures in determining overall executive pay (e.g., Banker et al. 2009; Bushman et al. 2006; Sloan 1993; Lambert and Larcker 1987) and the mix of cash versus equity-based compensation (e.g., Cohen et al. 2011; Carter et al. 2009; Davila and Penalva 2006), the question of what factors influence the use of EPS as a performance measure in compensation contracts has not been previously examined. This issue is

especially relevant recently, as company policies that encouraged excessive risk-taking and rewarded executives for delivering short-term profits were partially blamed for fueling the financial crisis of 2008.[2] Indeed, the Fannie Mae accounting debacle has been explicitly linked to an over-reliance on EPS in setting executive pay.[3] We therefore examine the economic determinants of firms' decisions to use EPS as a performance measure in annual bonus contracts as a question important in its own right; in addition, this analysis allows us to control for potential endogeneity between firms' financing and compensation choices.

To guide us in developing a model of firms' decisions to explicitly reward executives on EPS performance, we rely on insights from Fama (1980), who links incentive compensation to the underleveraging problem. That is, in the absence of incentive compensation, risk-averse managers will tend to favor equity over debt financing, as this choice reduces the risk of bankruptcy and protects the managers' under-diversified human capital, leading to underleveraging. Rewarding managers on EPS performance can help protect existing shareholders from underleveraging because, unlike other typically used performance measures such as net income, sales revenue, or cash flows, it is scaled by common shares outstanding and therefore has the ability to reflect any reduction of ownership interests. If EPS is employed in bonus contracts, in part, to serve this function, we expect it to be especially useful when there is a greater degree of agency conflicts between managers and existing shareholders. Using numerous proxies for agency conflicts (see Dey 2008), we document empirical evidence consistent with this argument, although we acknowledge that other interpretations are also possible.

We then test the associations between EPS dilution, compensation policies, and firms' debt-equity choices. To measure EPS dilution, we create an indicator variable that equals one whenever equity financing will result in greater dilution than debt financing, i.e., whenever the issuing firm's

E/P ratio exceeds its after-tax cost of debt. To examine the role of compensation contracts, we ascertain whether EPS performance is explicitly mentioned in firms' proxy statements as a determinant of executives' annual cash bonuses. If contracting incentives apply, we expect managers' aversion to EPS dilution to be intensified when their bonus compensation is explicitly linked to EPS performance.

We provide strong empirical evidence consistent with the contracting argument. After controlling for potential endogeneity between compensation policies and financing choices and for known determinants of debt-equity choice, we find that firms are significantly more likely to favor debt over equity financing when debt has a relatively smaller dilutive effect on EPS and when executives are explicitly compensated on EPS performance; i.e., managers are more likely to avoid EPS dilution when their pay depends on reported EPS. In supplemental tests, we also find that the likelihood of a debt issue is increasing in the interaction between EPS dilution and the magnitude of executives' bonus compensation for the subsample of firms that explicitly reward executives on EPS performance; we document no such associations for the firms that do not use EPS as a performance metric in their annual bonus contracts. We also find that clientele effects related to transient institutional ownership levels contribute to the phenomenon, but the results linking investor sentiment to managerial concerns over reported EPS were sensitive to some of our research design choices.

Overall, our findings are strongly consistent with a managerial preference for debt over equity financing in the presence of EPS dilution. While a managerial fixation on reported EPS may help address potential underleveraging problems, it could also lead to overleveraging, which Binsbergen et al. (2010) document as more costly. We therefore undertake additional analysis to explore whether managers' aversion to EPS dilution is associated with under- or overleveraging.

First, we examine the role that EPS dilution plays in determining firms' speed of adjustment to their target leverage levels. For firms that reward executives on EPS performance, we find that EPS dilution speeds the adjustment to target leverage when firms are below their targets, but tends to impede adjustment when firms are over their target, consistent with potential overleveraging. We also find that managerial fixation on EPS dilution significantly reduces the degree of firms' debt conservatism, as estimated using Graham's (2000) "kink" measure, but does not, on average, result in overleveraging. These findings complement those of Young and Yang (2011), who find that stock repurchase activity associated with EPS-contingent compensation provides net benefits to shareholders.

We make three main contributions to the existing literature. First, we contribute to the literature on executive compensation by providing empirical evidence on the determinants of the use of EPS as a performance metric in bonus contracts. Prior research has examined why earnings, in general, are prevalent in compensation contracts (see Sloan 1993), but to our knowledge, no paper has yet explored why EPS, in particular, is so often chosen as a performance measure when determining executive pay. Our results suggest that some of the usefulness of EPS in compensation contracts derives from its ability to reflect changes in percentage ownership and to mitigate agency conflicts related to potential underleveraging. As such, it appears to represent a corporate control mechanism that has not typically been considered in the governance literature (see Armstrong et al. 2010; Larcker et al. 2007). These findings shed new light on the factors that influence the design of compensation policies and help us understand the circumstances under which accounting is relatively more important to the contracting process (see Bushman and Smith 2001).

Second, we add to the newly emerging literature that links firms' use of EPS as a performance measure in compensation contracts to their financing choices. While previous literature

documents an association between EPS dilution and financing decisions (see Bens et al. 2002, 2003; Hovakimian et al. 2001; Graham and Harvey 2001), only recently has the use of EPS-contingent compensation been directly examined as a rationale for managers' preoccupation with EPS dilution. For example, using a small sample of convertible bonds, Marquardt and Wiedman (2005) find that firms are more likely to structure transactions to increase diluted EPS when bonuses depend on EPS performance, and Young and Yang (2011) find that UK firms are more likely to repurchase stock when compensation depends on EPS performance. However, neither Marquardt and Wiedman (2005) nor Young and Yang (2011) explore the question of why EPS is used in compensation contracts and thus are unable to control for potential endogeneity between compensation and financing policies, as we do in our empirical tests. Another distinguishing feature of our study is that we quantify the reporting effects of the financing decisions that we examine through our EPS dilution variable and interact it with firms' explicit use of EPS in setting executive pay, as well as with the magnitudes of both cash- and equity-based incentive compensation, thereby generating more powerful tests of the contracting hypothesis than were possible in prior research. Our findings therefore not only extend prior research by linking financial reporting incentives related to EPS performance to what is arguably the firm's most basic financing decision – the choice between debt and equity – but also lend new credence to prior work that has explored the consequences of contracting on EPS performance in other settings.

Finally, our results provide a plausible explanation for the "puzzling" managerial preoccupation with EPS dilution that has been documented not only within the corporate finance literature but within the accounting literature as well. For example, Bens et al. (2003) question the appropriateness of managers' apparent fixation on EPS dilution documented in their work; this sentiment is further echoed by Larcker (2003), who notes the absence of an equilibrium incentive

structure to support executives' concern regarding EPS dilution. If, however, managers are compensated on EPS, then their concerns about earnings dilution are not puzzling at all, but a well-founded and rational consideration, given their incentives. Our results also suggest that the use of EPS-contingent compensation may have implications in other settings where a "fixation" on reported EPS has been noted.

The remainder of this paper is organized as follows. In section 2, we discuss prior literature and develop our hypotheses. We describe our sample selection in section 3 and present our empirical analysis in section 4. Section 5 concludes.

2 Prior literature and hypothesis development

Modigliani and Miller (1958) show that in a world of perfect and complete capital markets, firm value is independent of capital structure. Using a numerical example of Modigliani and Miller's "conservation of value" argument, Brealey et al. (2007) concisely illustrate the "standard textbook view" regarding the relationship between EPS dilution and firm valuation. In short, leverage increases expected EPS but does *not* affect share price, and EPS dilution related to the choice between debt and equity financing is irrelevant in firm valuation.

Despite the supposed lack of a theoretical link between EPS dilution and firm value, survey and empirical evidence suggests that EPS dilution does affect financing decisions. Graham and Harvey (2001) report that EPS dilution is the single most important factor affecting CFOs' decisions to issue equity, with over two-thirds of CFOs citing it as a "very important" or "important" factor in their decision, and Hovakimian et al. (2001) empirically find that firms are less likely to choose equity over debt financing when an equity issue will dilute EPS. These findings suggest that the "standard textbook view" of EPS dilution is somehow incomplete.

Myers (1984) summarizes the costs and benefits of financial leverage not considered by Modigliani and Miller (1958), classifying them into three general categories: tax benefits; bankruptcy costs; and agency costs. Of these, we argue that the existence of agency costs related to compensation contracting is most likely to explain managers' concern with EPS dilution. As articulated by Jensen and Meckling (1976), the agency problem between a firm's shareholders and its managers arises due to the imperfect observability of managerial effort, resulting in costly contracting. Watts and Zimmerman (1986) further theorized that in the presence of agency costs and information asymmetry, contracting considerations affect managers' accounting choices. Consistent with these assertions, a large empirical literature has documented that the determination of accounting income and selection of accounting methods is linked with executive compensation policies (e.g., Healy 1985; Holthausen et al. 1995; Cheng and Warfield 2005; Carter et al. 2007).

We extend this line of inquiry by considering the effect of compensation contracts that explicitly link executives' annual cash bonuses to EPS performance. When compensation is contingent upon EPS performance, managers have an incentive to influence their pay not only through the operating and reporting decisions that affect net income, but also through financing decisions that affect the number of shares outstanding used in EPS calculations, and previous literature documents that financing decisions to undertake debt-equity swaps (Hand 1989), contingently convertible debt issuances (Marquardt and Wiedman 2005), and stock repurchases (Bens et al. 2002; Bens et al. 2003; Hribar et al. 2006; Myers et al. 2007; Young and Yang 2011) are influenced by EPS reporting incentives. Because the choice between debt and equity financing differentially impacts reported EPS, we expect managers who are rewarded explicitly on EPS performance to make financing decisions that will most benefit reported EPS figures, *ceteris paribus*. This leads to our first hypothesis:

H1: Managers are more likely to avoid EPS dilution related to debt-versus-equity choice when their bonus compensation is explicitly linked to EPS performance than when it is not.

However, several forces may work against this argument. For example, if compensation committees implicitly adjust for the effects that financing choices have on reported EPS, then managers will not bother to avoid EPS dilution in making these decisions (Gaver and Gaver 1998; Cheng 2004). In addition, if the board of directors is ultimately responsible for the firm's capital structure choices, managers may not have adequate opportunity to influence financing choices to benefit reported EPS figures. Managers may also have less costly avenues through which they may achieve EPS reporting objectives than through financing choices. To the extent that any of these scenarios apply, the power of our tests is reduced and our empirical tests are biased against H1.

An additional concern is that the magnitude of stock-based compensation tends to far outweigh that of earnings-based bonus compensation, leading some to argue that bonus pay is all but irrelevant in terms of influencing managerial behavior (see Hall and Liebman 1998). However, Murphy and Jensen (2011) observe that incentive plans are only effective "if the participants understand how their actions affect the payoffs they will receive and then act on those perceptions." Because managers understand how to increase EPS, for example, but often do not understand how their actions affect company stock prices, bonus plans "may well provide stronger incentives than equity-based plans, even when the magnitude of the payoff is smaller."[4] Consistent with this observation, Bruggen and Moers (2007) find in a multi-task experimental setting that agents allocate more effort to tasks that allow for the measurement of their exertions versus those that do not; Holmstrom and Milgrom (1991) report similar findings in a theoretical setting.

Furthermore, the incentive effects of bonus contracts may reach beyond the dollar amount of pay received. For example, Bushman and Smith (2001) argue that the fact that boards "design intricate cash compensation payouts indicate that this still remains an important channel by which

boards communicate expectations to top management. Given that a primary task of the board is to hire and fire top management, the apparent care exercised by boards in determining the basis for cash compensation cannot be dismissed as unimportant just because large stock option portfolios exist." Consistent with this argument, Hoppe and Moers (2008) find that CEO terminations are related to the performance measures employed in bonus contracts. In addition, Armstrong et al. (2010) also note that bonus plans may be designed to provide incentives for lower level executives beyond the CEO, which is a common practice – Rosenberg (2001) reports that a majority of firms provide incentive pay to employees below the executive level. We thus predict that the explicit use of EPS in determining bonus compensation will influence financing choice, but caution that the relatively small proportion of bonus compensation to total compensation may bias our empirical tests against H1.

We also note that evidence consistent with H1 provides one rational explanation for managers' previously documented aversion to EPS dilution, but would not necessarily imply that managers' financing decisions are suboptimal. Prior research shows that incentive compensation is often used to induce managers to take on greater levels of debt because managers often tend to under-leverage to reduce firm risk and protect their under-diversified human capital (Fama 1980). For example, Mehran (1992) finds that firms' leverage ratios are positively associated with the percentage of executives' total compensation in incentive plans, and Berger et al. (1997) report lower leverage levels in firms where executive compensation plans are less sensitive to performance. Evidence relating compensation contracting to managerial aversion to EPS dilution would be consistent with the predictions of agency theory.

While the compensation contracting argument presented above in H1 is compelling, a second explanation, also noted by Graham and Harvey (2001), is possible – that managers "focus

more than they should" on EPS dilution. We therefore also explore whether behavioral theories might play a role in explaining managers' preoccupation with EPS dilution. Prior research shows that investor sentiment – defined as a bias in investors' expectations of future firm performance – affects firms' investing and financing decisions (see Baker et al. 2007), as well as disclosure and financial reporting choices (see Bergman and Roychowdhury 2008; Brown et al. 2012; and Rajgopal et al. 2007). When market sentiment is low, investors are pessimistic about future prospects and undervalue the firm. Managers may be particularly reluctant to dilute EPS at these times, as investors already have a negative view of the firm's long-term outlook. In contrast, when sentiment is high, EPS dilution will be less likely to concern investors, as they view the firm's long-term prospects as good. If managers cater to investor demand, we expect managers to especially avoid EPS dilution when investor sentiment is low, as investors are likely to overweight short-term performance during these periods. If managers ignore investor demand, we expect no association between EPS dilution and investor sentiment. Stated formally:

> **H2:** Managers are more likely to avoid EPS dilution related to debt-versus-equity choice when investor sentiment is low.

There is also empirical evidence that investor clienteles influence managers' financial reporting choices. In particular, Bushee (2001) finds that transient institutional owners tend to overvalue current earnings in pricing securities, and high levels of transient institutional ownership has been linked to myopic financial reporting behavior by managers. For example, Bushee (1998) reports evidence that firms with high levels of transient institutional ownership are more likely to cut R&D to reverse an earnings decline, and Matsumoto (2002) finds that firms with high transient ownership are more likely to meet or exceed earnings expectations. The short-term focus of these investors may intensify managers' preferences for higher reported EPS, making them more likely avoid EPS dilution. This leads to our final hypothesis:

H3: Managers are more likely to avoid EPS dilution related to debt-versus-equity choice when transient institutional ownership is high.

We note that our compensation hypothesis H1 and our behavioral hypotheses H2 and H3 are not mutually exclusive; that is, both arguments may contribute to resolving the conflict between the existing theoretical and empirical findings regarding the role of EPS dilution in financing decisions.

3 Sample and data

As described in more detail below, we follow the standard methodology from the corporate finance literature in examining firms' debt-equity issuance decisions. We obtain financial data from Compustat 2007, stock price information from CRSP 2007, and compensation data from ExecuComp 2007. We exclude firms in financial industries (SIC codes 6000—6999) since their financial reporting and capital structure are likely to be very different from those of other firms.[5] We also restrict our sample to firm-years with total assets above $10 million. Because ExecuComp is available from 1992 and we require one-year lagged data for some our variables, our sample period starts in 1993 and ends in 2005. We obtain 5,980 firm-year observations from 1993 to 2005 with the necessary data to complete the first stage estimation of target leverage ratios.

Following prior literature (Hovakimian et al. 2001), we define net debt issued as the change in the book value of total debt; net equity issued is defined as the proceeds from sale of common and preferred stock (Compustat Annual Item 108) minus purchase of common and preferred stock (Compustat Annual Item 115).[6] Firms are identified as issuing a security when the net amount issued exceeds 5% of total assets; dual issuers (i.e., firms that issued both debt and equity in the same fiscal year) are removed, consistent with Hovakimian et al. (2001).[7] After merging with our sample containing nonmissing financial, stock return, and executive compensation variables, we obtain a sample of 2,397 firm-years with security (debt or equity) issuances.

To identify firms with bonus compensation contracts that are explicitly based on EPS, we access the proxy statements of the 2,397 firm-years with security issuances via SEC Edgar and search for the description of bonus compensation contracts. We collect a sample of 614 firm-years whose bonus contracts are explicitly based on EPS. Another sample of 1,188 firm-years did not mention EPS in their description of their annual bonus plans in proxy statements filed with the SEC. We were unable to obtain proxy statements for the remaining 595 firm-years.[8] Our sample is further reduced by the data required to estimate the determinants of using EPS as a performance measure in bonus contracts, resulting in a total of 1,493 firm-years in our empirical tests.

4 Empirical analyses

4.1 Determinants of using EPS as a performance measure in bonus contracts

Because compensation structure and financing policies may be jointly determined (see Smith and Watts 1992; Skinner 1993), we use two-stage procedures to help address potential endogeneity issues when testing our contracting hypothesis H1. In this subsection, we model the economic determinants of using EPS as a performance measure in bonus contracts. To guide us in this endeavor, we first compile comprehensive descriptive data on the variety of performance measures used in annual bonus contracts for our sample firms from 2005, the last year of our sample period. This exercise will help us identify the most likely alternatives to EPS performance that are used in the compensation contracts of our sample firms.

This descriptive data in presented in Panel A of Table 1. Similar to Kim and Yang (2010), we find that EPS is the most common performance metric used in annual bonus contracts, with 74 of the 165 (44.8%) firms listing it in their proxy statement as an explicit determinant of bonus compensation. Sales revenue is the second-most common choice, with 69 firms (41.8%) reporting

its use, followed by operating income measures (37.0%), non-financial measures (33.3%), accounting return measures (29.7%), cash flows (19.4%) and net income (18.2%). Firms typically use more than one performance measure -- the mean (median) number of measures reported is 2.8 (2.0) – and virtually all firms use at least one earnings measure in their bonus contracts.

In Panel B, we split our sample into firms that report the use of EPS as a performance measure and those that do not and compare the frequency of the remaining performance measures across the two groups using a chi-squared test. We find that firms that use EPS as a performance measure in their bonus contracts are significantly less likely to also include operating/pretax earnings/EBITDA and non-financial performance measures than other firms. They are also significantly less likely to employ EVA and more likely to include accounting return measures. Firms that use EPS also tend to use more performance measures overall, with a mean (median) of 3.10 (3.0) measures versus 2.48 (2.0) for other firms.

We draw upon these descriptive findings, as well as prior research, in developing our empirical model of the decision to base annual bonuses on EPS performance. The most obvious distinction between EPS and the other performance measures listed in Panel A of Table 1 is that it is scaled by common shares outstanding and therefore has the ability to reflect any changes in percentage ownership resulting from the issue of new shares. This is especially important for our purposes, because it results in a performance metric that often improves under debt financing relative to equity financing – i.e., reported EPS is often *higher* under debt financing than under equity financing. This is not the case with most other performance measures. For example, net income, cash flow measures, and accounting return measures such as ROA or ROIC are always lower under debt financing due to the effects of interest expense, and debt-equity choice has no differential effect on revenue, operating income, or non-financial metrics. While it is arguable that

price or stock return measures might also benefit more from debt than from equity financing, the effect is far less direct, predictable, or as easily quantified as in the case of EPS. Furthermore, as shown in Panel A of Table 1, relatively few firms (less than 5%) use shareholder returns as a performance metric in their bonus contracts. It thus appears likely that one rationale for using EPS as a performance measure is to encourage managers to take on greater levels of debt.

Fama (1980) argues that in the absence of incentive compensation, conflicts between managers and shareholders over financing policy are likely to arise because managers will tend to favor equity over debt financing, as this choice reduces the risk of bankruptcy and protects the managers' under-diversified human capital, leading to underleveraging. If EPS is used, in part, to help alleviate the under-leveraging problem, we expect it to be especially useful when there is a greater degree of separation of control and ownership and greater levels of information asymmetry between managers and shareholders, i.e., when there are higher existing levels of agency conflicts between managers and shareholders. We consequently expect the likelihood of using EPS as a performance measure in compensation contracts to be positively associated with the degree of agency conflicts between managers and existing shareholders.

It is important to note that contracting on EPS performance is not the only way to address the related problems of underleveraging and reductions of ownership interests. Alternative mechanisms to induce optimal leveraging include equity-based incentive compensation and/or managerial ownership, which we view as substitutes for contracting on EPS performance. However, contracting on EPS may be incrementally useful even in the presence of managerial share ownership, as high levels of managerial ownership may lead to entrenchment (Berger et al. 1997). In addition, Ofek and Yermack (2000) show that managers tend to sell shares after receiving equity-based compensation, counteracting boards' attempts to tie their wealth to firm value, and Dash

(2011) reports that executives frequently engage in hedging strategies that limit the downside risk associated with holding company stock. Most importantly, the awards of equity-based compensation themselves result in reduced percentage ownership for outside shareholders and reduced leverage for the firm, thereby exacerbating any under-leveraging problem.

We also acknowledge that EPS is not the only performance measure that might assist in alleviating these conflicts. For example, return on equity (ROE) would perform a similar function. However, in compiling our descriptive data in Table 1, only eight firms listed ROE as an explicit determinant of annual bonuses, and six of these firms also listed EPS as a determinant of bonus pay. To the extent that some sample firms use ROE, but not EPS, in their annual bonus contracts, the power of our tests is reduced.

Keeping these caveats in mind, we model the use of EPS in bonus contracts as a function of the degree of agency conflicts between managers and existing shareholders. Following Dey (2008), we proxy for agency conflicts using firm size, complexity, free cash flows, debt payments , growth, and ownership structure but also include dividend yields, managerial entrenchment, effective tax rates, regulation, innovation, analyst coverage, and relative noise in EPS as additional proxies. We include firm *SIZE*, defined as the log of sales, because large firms have a greater scale of operations, which provides greater incentives and opportunities for managers to shirk, exacerbating agency problems (Demsetz and Lehn 1985). We include firm *COMPLEXITY*, measured as log of the number of reporting segments, as multi-segment firms combine diverse operations, resulting in information aggregation problems that can lead to asymmetries between managers and outside shareholders (Bushman et al. 2004). We include free cash flows (*FCF*, defined as operating cash flows minus capital expenditures, scaled by total assets) because Jensen (1986) argues that conflicts between managers and shareholders are more severe when there are high levels of free cash flows –

managers may waste the cash on organizational inefficiencies or invest it in projects that earn less than the cost of capital instead of paying it out to shareholders. Jensen (1986) also argues that the use of debt and dividend payments can help in reducing the agency problems caused by excess cash flows. Accordingly, we include *DEBTPAYMENT*, defined as the sum of interest payments and the current portion of long-term debt, divided by total assets, and *DIVIDENDS*, defined as annual cash dividends over year-end share price, as additional proxies for agency conflicts. Managers may also be more likely to invest in negative NPV projects when future growth prospects are limited (Harvey et al. 2004); we thus include growth, defined as the market-to-book (*MB*) ratio, as an additional proxy and expect it to be negatively associated with the use of EPS in bonus contracts.

To capture ownership structure, we include managerial ownership (*MGRSHARES*, defined as the percentage of stock outstanding owned by the top 5 executives) which should be inversely related to agency conflicts and thus negatively related to the use of EPS in bonus contracts; and transient institutional ownership (*TRANSIENT*, defined as the percentage of stock outstanding owned by institutions that engage in short-term trading strategies), which we argue is positively related to agency conflicts in our setting, as managers may wish to reduce the control that these influential shareholders have over the firm by reducing their proportional ownership. We also include managerial entrenchment (*ENTRENCHED*, defined as a weighted index of the following four variables: the Gompers et al. (2003) measure of shareholder rights; the proportion of executives that serve on the board of directors; an indicator variable that equals one if the CEO is also the chairman of the board; and the number of board meetings), as entrenched managers have greater discretion to engage in rent extraction activities, thereby increasing agency conflicts.

We include effective tax rates (*ETR*, defined as income tax expense divided by pretax income) as a proxy for agency conflicts, as Klassen (1997) finds that firms with high agency costs

tend to be less concerned with tax reporting than financial reporting. We thus expect *ETR* to be positively associated with the use of EPS in bonus contracts. We also include *REGULATION*, defined as a dummy variable with a value of one if a firm operates in telecom or utility industry (SIC codes 481 and 491-494), as an inverse proxy for agency conflicts, as the regulator will provide monitoring to reduce potential conflicts between managers and outside shareholders. Francis and Smith (1995) find that diffusely-held firms are less innovative because incentive contracts, which diffusely-held firms rely upon in lieu of direct monitoring, are not effective at reducing the high agency costs of inventive activity. As a measure of innovation, we include *R&D* intensity, defined as the ratio of R&D to sales revenue, in our model and expect it to be negatively associated with the use of EPS in bonus contracts.[9]

We also include analyst *COVERAGE* as an additional proxy. Bhushan (1989) argues that the number of analysts following a firm proxies for the total expenditures on information acquisition for a firm; thus higher coverage implies a higher demand for private information about the firm, consistent with greater informational asymmetries and agency conflicts between managers and shareholders. Consistent with this notion, Lang et al. (2004) find that analyst following is higher for large firms with low managerial ownership. We therefore expect *COVERAGE* to be positively associated with the use of EPS in bonus contracts.

We also include in our model the relative *NOISE* in EPS, defined as the ratio of time-series variance of ΔEPS to time-series variance of stock returns over our sample period, and expect a negative relation with the likelihood of using EPS as a performance measure (Lambert and Larcker 1987). Lastly, we include year and industry fixed effects to control for time and industry trends in compensation structure. Our final model is as follows:

$$EPS_{i,t} = \gamma_0 + \gamma_1 SIZE_{i,t-1} + \gamma_2 COMPLEX_{i,t-1} + \gamma_3 FCF_{i,t-1} + \gamma_4 DEBTPAYMENT_{i,t-1} + \gamma_5 DIVIDENDS_{i,t-1} + \gamma_6 MB_{i,t-1} + \gamma_7 MGSHARES_{i,t-1} + \gamma_8 TRANSIENT_{i,t-1} + \gamma_9 ENTRENCHED_{i,t-1} + \gamma_{10} ETR_{i,t-1} + \gamma_{11} REGULATION_{i,t-1} + \gamma_{12} R\&D_{i,t-1} + \gamma_{13} COVERAGE_{i,t-1} + \gamma_{14} NOISE_{i,t-1} + \gamma_{15} YEARIND_t + \varepsilon_t \quad (1)$$

In Table 2, we present descriptive statistics for the independent variables in Eq. (1) and univariate tests of differences in means and medians across the firms that use EPS as a performance metric in bonus contracts (EPS=1) versus those that do not (EPS=0). We find that, as expected, the EPS=1 firms are significantly larger in *SIZE* and *COMPLEXITY*, have significantly greater free cash flows (*FCF*), dividend yields (*DIVYIELD*), and analyst *COVERAGE*, and significantly lower managerial ownership (*MGRSHARES*) and *R&D* expenditures than the EPS=0 group. We also find that mean *TRANSIENT* institutional ownership and mean effective tax rates (*ETR*) are significantly higher for the EPS=1 group and median market-to-book (*MB)* ratios are significantly lower, which is also consistent with our expectations. We find no significant differences across the two groups for *DEBTPAYMENT,* the *ENTRENCHED* variable, the percentage of firms affected by *REGULATION*, the amount of *NOISE* in EPS versus returns. However, we note that for even these variables, the direction of each difference is as predicted, though the p-values do not reach conventional levels of significance.

As shown in Table 3, results from our probit estimation of Eq. (1) are generally consistent with the univariate results from Table 2. The likelihood of using EPS as a performance measure in bonus contracts is significantly positively related to *SIZE*, *COMPLEXITY,* free cash flows (*FCF*), *DIVYIELD*, *TRANSIENT* institutional ownership, effective tax rates (*ETR*), and analyst *COVERAGE,* and is marginally negatively associated with market-to-book ratios (*MB*), *R&D* intensity, and relative *NOISE* in EPS. The remaining variables are not significantly associated with the use of EPS in bonus contracts, though we again note that in most cases the sign of the estimated coefficient is in the predicted direction. Overall, we interpret these findings as consistent with the

notion that firms use EPS as a performance metric in bonus contracts when agency conflicts between managers and shareholders are high, which suggests that contracting on reported EPS serves as a corporate control mechanism not previously considered in the governance literature.

We obtain predicted values from Eq. (1) to control for possible endogeneity in our analysis of debt-equity issuances, as described in the following subsection.

4.2 EPS dilution and debt-equity choice

4.2.1 Main tests

To formally test H1-H3, we estimate the following probit model:

$$\begin{aligned} P(DEBTISSUE_{i,t}) = {} & \beta_0 + \beta_1 EPSDILUTION_{i,t} + \beta_2 EPS_{i,t} + \beta_3 EPS_{i,t} * EPSDILUTION_{i,t} \\ & + \beta_4 SENTIMENT_{i,t} + \beta_5 SENTIMENT_{i,t} * EPSDILUTION_{i,t} \\ & + \beta_6 TRANSIENT_{i,t} + \beta_7 TRANSIENT_{i,t} * EPSDILUTION_{i,t} \\ & + CONTROLS_{i,t} + \beta YEARIND_{i,t} + \eta_{i,t} \end{aligned} \quad (2)$$

In Eq. (2), *DEBTISSUE* is an indicator variable that equals one when net debt is issued and zero when net equity is issued. *EPSDILUTION* is a dummy variable indicating whether an equity issue will dilute EPS. It is set to one when $E/P > r_d (1-T_c)$, where E/P is the firm's earnings/price ratio, r_d is the cost of debt, and the corporate tax rate T_c is the firm-specific marginal tax rate, and zero otherwise.[10] As described in more detail in the Appendix, the numerator of the E/P ratio is the reported value of diluted EPS at the end of the fiscal year of the debt or equity issue (annual Compustat item 57), and P should ideally be measured at the time the debt or equity is issued. However, because our dependent variable is based on *net* debt/equity issues over the entire fiscal year, no single issue date is available; accordingly, we use the average of beginning and end of year price in constructing our earnings/price ratio. To estimate firms' cost of debt, r_d, we obtain S&P long-term credit ratings from Compustat (annual item 280) and average annual yields on Moody's

Aaa and Baa rated debt from Federal Reserve Economic Data (FRED). We plot the relation between credit ratings and debt yields for each year using the Aaa and Baa yields obtained from FRED and use predicted yields from this procedure for firms that have credit ratings other than AAA or BBB (the S&P equivalents to Moody's Aaa and Baa).[11] In cases where the firm's credit rating is missing from Compustat, we use the yield on Moody's Baa rated debt, consistent with Hovakimian et al. (2001).[12] *EPSDILUTION* equals one (zero) when an equity (debt) issue results in a lower reported EPS than would obtain if debt (equity) were instead issued. We therefore predict a positive relation between debt issuance and *EPSDILUTION*.[13]

EPS is an indicator variable that equals one when EPS is explicitly mentioned in the firm's proxy statement as a determinant of executives' annual bonus compensation, and zero otherwise. We expect a positive association between debt issuance and *EPS*, as managers with EPS-based bonus schemes are likely to prefer debt over equity financing, on average, because debt financing generally results in higher reported EPS (see Modigliani and Miller 1958; Brealey et al. 2007).

A key variable of interest is *EPS*EPSDILUTION*, which is the interaction term between *EPS* and *EPSDILUTION*. A significantly positive estimated coefficient on this variable would indicate that managers are more likely to be concerned with EPS dilution when their compensation depends upon reported EPS, consistent with H1.[14]

To test whether behavioral-based explanations apply, we include investor sentiment (*SENTIMENT*) and transient institutional ownership (*TRANSIENT*) to equation (2). Consistent with Baker and Wurgler (2000), who find that companies issue more equity than debt when investor sentiment is high, we expect a negative association between *SENTIMENT* and *DEBTISSUE*. We make no prediction regarding the association between *TRANSIENT* and *DEBTISSUE*, as prior studies examining the relationship between institutional ownership and debt policies has yielded

mixed findings (see Ashbaugh-Skaife et al. 2006).

More importantly for our purposes, however, is the significance of interaction terms *SENTIMENT*EPSDILUTION* and *TRANSIENT*EPSDILUTION*, which allow us to test H2 and H3, respectively. If investor sentiment and clientele effects are related to the dilution puzzle, we expect a negative coefficient on *SENTIMENT*EPSDILUTION* and a positive coefficient on *TRANSIENT*EPSDILUTION*. We define *TRANSIENT* using Bushee's (1998) investor trading classification scheme and *SENTIMENT* using the investor sentiment index developed by Baker and Wurgler (2006).[15]

We also include additional control variables that are known to influence debt-equity financing decisions. Trade-off theory suggests that firms choose the form of financing to offset the distance from their target leverage ratios (Hovakimian et al. 2001; Kayhan and Titman 2007). We therefore include the variable *DEVIATION*, defined as the difference between a firm's observed leverage ratio and its estimated ratio based on a tobit regression of book value of debt on a set of explanatory variables identified in prior research.[16] We expect a negative relation between *DEVIATION* and *DEBTISSUE*; that is, we predict that a firm is more likely to issue debt (equity) when firm when observed leverage is below (above) its target leverage ratio.

Baker and Wurgler (2002) indicate that firms tend to raise capital from the equity market when share prices perceived to be more favorable. We use the market-to-book ratio (*MB*), defined as (total assets – book value of equity + market value of equity) / total assets, and stock returns (*RET*), defined as the split- and dividend-adjusted raw return over the previous two fiscal years, to control for these market timing effects. We control for past profitability using average return on assets, defined as EBITDA over total assets, for the previous three fiscal years (*ROA*). Firms with better past profitability have internally generated funds available and tend to rely less on borrowed

funds (Baker and Wurgler 2002). We proxy for tax benefits using net operating loss carry forwards (*NOLC*). Firms with NOLCs are less able to utilize the tax shield that debt financing provides (Graham 1996) and should be less likely to issue debt. Following Hovakimian et al. (2001), we include an indicator variable, *MB>1DUMMY,* that is set to one if the market-to-book ratio exceeds one and zero otherwise; this variable indicates whether an equity issue will dilute the firm's book value per share and is expected to be negatively associated with the likelihood of a debt issue. Hovakimian et al. (2001) report that debt issues tend to be smaller in size than equity issues; we therefore include *ISSUESIZE,* defined as the sum of the net debt and net equity issued, as a control.[17] Kisgen (2006) finds that firms near a credit rating change are more likely to issue equity than debt; we control for this effect by including *CREDIT*Δ, which is an indicator variable that equals one if the firm's average S&P credit rating includes a plus or minus sign and zero otherwise. We expect negative estimated coefficients on all of the above control variables.

We estimate Eq. (2) using three empirical approaches. We start by estimating a simple probit regression. However, because this approach may lead to biased coefficients due to possible endogeneity between compensation structure and financing choice, we also use two-stage procedures to control for this effect. Because the dependent variable in equation (2) is binary rather than continuous, we follow Wooldridge (2002) and use the predicted value of *EPS* as an instrument in the second stage (see, e.g., Chang et al. 2009). We also transform *DEBTISSUE* into a continuous variable by defining it as the percentage of debt over total capital raised, which allows us to use a traditional two-stage least square (2SLS) procedure to control for endogeneity in compensation structure.[18]

Table 4 presents descriptive statistics and univariate comparisons for variables used to estimate equation (2). We find that equity issues are significantly more likely to dilute EPS in firms

that explicitly reward executives on EPS performance: mean *EPSDILUTION* is 0.516 for the EPS=1 subsample versus 0.418 ($p<0.01$) for the EPS=0 firms. The EPS=1 group is also more over-levered relative to their target debt ratios than the EPS=0 group – both mean and median *DEVIATION* are significantly larger at $p<0.01$. We further find that the EPS=1 group is significantly less profitable as measured by ROA, has fewer tax loss carryforwards (mean *NOLC* is 0.056 versus 0.112 for the EPS=0 group, $p<0.01$) and less stock price runup prior to the issue (median *RET* is 0.174 versus 0.248, $p=0.05$), and are less likely to have their book values diluted when equity is issued (mean (*MB>1)DUMMY* is 0.939 versus 0.960, $p=0.05$). In addition, *ISSUESIZE* is marginally significantly smaller for the EPS=1 group.

Table 5 presents results from estimating Eq. (2). In column (1) where we use a simple probit regression, the estimated coefficients on *EPS* and *EPSDILUTION* are both significantly positive, as expected. More importantly, we find that the interaction term *EPS*EPSDILUTION* has a positive coefficient of 0.329 ($p=0.02$). This finding indicates that managers are more likely to issue debt when their bonuses are based on EPS and an equity issue will result in a lower reported EPS, consistent with the contracting hypothesis H1.

Regarding the behavioral variables *SENTIMENT* and *TRANSIENT,* both have significant main effects and marginally significant interaction effects with *EPSDILUTION*. The estimated coefficient on *SENTIMENT*EPSDILUTION* is -0.206 and marginally significant ($p=0.07$), which provides weak evidence that managers are less (more) concerned about EPS dilution when investor sentiment is high (low), consistent with H2. The estimated coefficient on *TRANSIENT*EPSDILUTION* is 1.026 ($p=0.06$), which weakly suggests that managers pay greater attention to EPS dilution when transient institutional ownership is high, consistent with H3. Thus both investor sentiment and clientele effects appear to contribute to the EPS dilution phenomenon,

though not as strongly as compensation structure. We also find that, as expected, the estimated coefficient on *DEVIATION* is negative and significant (p=0.01), which supports the trade-off theory that firms choose the form of financing to offset deviations from their target leverage ratios. In addition, other control variables *MB, RET*, *ROA, NOLC*, and *ISSUESIZE* are significantly negatively related to the likelihood of debt issues, consistent with their predicted sign.

These findings are corroborated in columns (2) and (3) of Table 5, where we present results from a two-stage Wooldridge (2002) procedure and a 2SLS estimation, respectively, to address concerns regarding endogeneity in compensation structure. The significance levels of *EPS*EPSDILUTION* and *TRANSIENT*EPSDILUTION* improve in columns (2) and (3), and the other results are generally consistent with those reported in column (1). Overall, our results indicate that while both contracting and clientele effects help to explain managerial aversion to EPS dilution, the evidence linking investor sentiment to the phenomenon is somewhat weaker. In addition, the relative consistency between the results from the simple probit regression versus those from the two-stage methods in columns (2) and (3) suggests that endogeneity between compensation and financing decisions does not appear to be an important econometric issue in our setting.

4.2.2 EPS Dilution and the Magnitude of Bonus Compensation

The results in Table 5 are strongly consistent with a contracting explanation for managerial concerns regarding EPS dilution (H1). We expand upon this finding by examining the relationship between EPS dilution and the magnitude of executive bonus and equity-based compensation using the following model:

$$P(DEBTISSUE_{i,t}) = \beta_0 + \beta_1 EPSDILUTION_{i,t} + \beta_2 BONUSCOMP_{i,t} + \beta_3 BONUSCOMP_{i,t} * EPSDILUTION_{i,t} + \beta_4 EQUITYCOMP_{i,t} + \beta_5 EQUITYCOMP_{i,t} * EPSDILUTION_{i,t} + \beta_6 SENTIMENT_{i,t} + \beta_7 SENTIMENT_{i,t} * EPSDILUTION_{i,t} + \beta_8 TRANSIENT_{i,t} + \beta_9 TRANSIENT_{i,t} * EPSDILUTION_{i,t} + CONTROLS_{i,t} + \beta\, YEARIND_{i,t} + \eta_{i,t} \quad (3)$$

To simplify the interpretation of interaction effects, we estimate Eq. (3) separately for firms that reward executives explicitly on EPS performance versus those that do not. We incorporate the magnitude of incentive compensation by including both the average of the top five executives' annual cash bonus compensation (*BONUSCOMP*) and new grants of stock options and restricted stocks (*EQUITYCOMP*).[19] Following McAnally et al. (2008) and Efendi et al. (2007), we scale both variables by cash salary for the same fiscal year to capture the relative importance of each component of incentive compensation. We expect both *BONUSCOMP* and *EQUITYCOMP* to be positively related to *DEBTISSUE*, as prior research has shown that incentive compensation induces managers to take on greater debt levels (see Berger et al. 1997).[20]

Our main variables of interest, however, are the interaction terms, *BONUSCOMP*EPSDILUTION* and *EQUITYCOMP*EPSDILUTION*. If the contracting hypothesis posited in H1 applies, we expect a positive coefficient on *BONUSCOMP*EPSDILUTION* for the subsample of firms that reward executives on EPS performance, but have no such expectation for the subsample that does not. In addition, we do not expect the interaction between *EQUITYCOMP* and *EPSDILUTION* to be a significant determinant of *DEBTISSUE* in either group of firms since *EQUITYCOMP* tends to be more strongly associated with returns than earnings performance (see Core et al. 2003).

We present results in Table 6. Consistent with our expectations, we find that the estimated coefficient on *BONUSCOMP*EPSDILUTION* is positive and significant (p=0.01) only in the

subsample of firms that explicitly reward EPS performance while the estimated coefficient on *EQUITYCOMP*EPSDILUTION* is not significantly different from zero in either subsample. These results provide additional support for the contracting hypothesis (H1). In addition, we continue to find strong evidence in support for the clientele hypothesis (H3). However, we note that the estimated coefficient on *SENTIMENT*EPSDILUTION* is no longer significant, and we fail to reject H2 using this model specification.

4.3 EPS Dilution and Under/Overleveraging

Our results in the previous subsection are strongly consistent with a managerial preference for debt over equity financing in the presence of EPS dilution. While a managerial fixation on reported EPS may help address the potential underleveraging problems identified by Fama (1980), another consequence may be overleveraging, which Binsbergen et al. (2010) document as more costly. We therefore undertake additional analysis to explore whether a managerial focus on EPS might alleviate underleveraging or contribute to overleveraging problems.

4.3.1 EPS dilution and adjustment to target leverage

Our results in Table 5 are consistent with the trade-off theory of capital structure: firms that are above (below) their target leverage ratio are more likely to issue equity (debt). However, if managers focus on reported EPS instead of target leverage, this may lead to suboptimal financing decisions. For example, suppose a firm is above its target leverage ratio (i.e., *DEVIATION* is positive) and would therefore be expected to issue equity rather than debt for its financing needs, but an equity issue would dilute EPS – what will the manager do? Does a focus on the reporting effect interfere with the firms' adjustment to its target leverage?

To explore this question, we extend the analysis in Table 5 by interacting our *EPSDILUTION* variable with the distance from the firm's target leverage ratio as measured by *DEVIATION*. Because we expect different behavior conditional on whether firms are above or below their targets, we follow Byoun (2008) and replace *DEVIATION* with its positive and negative parts (*POSDEVIATION* and *NEGDEVIATION*, respectively). Managerial focus on reported EPS should accelerate firms' adjustment to target leverage when firms are below their targets – i.e., the estimated coefficient on *NEGDEVIATION*EPSDILUTION* should be negative. A non-negative estimated coefficient on *POSDEVIATION*EPSDILUTION*, however, is consistent with a focus on EPS dilution impeding firms' adjustment to their target ratio.

Our results are consistent with these expectations. As shown in the leftmost column of Table 7, the estimated coefficient on *NEGDEVIATION*EPSDILUTION* is significantly negative (-0.805, $p<0.05$) for the full sample, and the estimated coefficient on *POSDEVIATION*EPSDILUTION* is positive but does not quite reach conventional levels of significance (0.197, $p=0.12$). This indicates that avoiding EPS dilution appears to provide a benefit to shareholders by helping to resolve underleveraging, but also implies that firms are reluctant to address an overleveraging problem when an equity issue would reduce reported EPS. We further find that this result is confined to the EPS=1 subsample, where the significance level on *NEGDEVIATION*EPSDILUTION* drops to 0.01 and the estimated coefficient on *POSDEVIATION*EPSDILUTION* remains positive, though not quite significantly so ($p=0.11$). In contrast, the estimated coefficients on both *POSDEVIATION*EPSDILUTION* and *NEGDEVIATION*EPSDILUTION* are negative and insignificant. Rewarding executives on EPS performance thus appears to significantly accelerate the speed with which underleveraging is corrected but may also impede the resolution of overleveraging.

4.3.2 EPS dilution and debt conservatism

We explore the question of whether EPS-based incentive compensation encourages overleveraging more generally by examining its effect on firms' overall debt conservatism. To estimate debt conservatism, we use Graham's (2000) "kink" measure, which is defined as the ratio of the amount of interest expense a firm could pay before the expected marginal tax benefits of debt begin to diminish to the actual amount of interest paid.[21] Thus, a "kink" greater than one indicates that the firm has "left money on the table" with regard to the tax-deductibility of interest – i.e., a high "kink" ratio indicates that a firm is using debt conservatively.

We follow the approach described in Malmendier et al. (2011) and use tobit regression to examine whether managerial concern with EPS dilution influences debt conservatism, identifying control variables from Graham (2000). As shown in Table 8, we find that the use of EPS-based compensation significantly reduces debt conservatism – the estimated coefficient on *EPS* is -0.652 ($p<0.01$). In addition, both *EPSDILUTION* and *EPS*EPSDILUTION* have significantly negative coefficients of -1.407 ($p<0.01$) and -0.827 ($p<0.01$), respectively, which again suggests that the use of EPS-contingent compensation helps to alleviate underleveraging.

To gauge whether explicitly rewarding executive on EPS performance might result in overleveraging, we first note that the mean *KINK* in our sample of debt-equity issuers is 4.094. This figure is well above the threshold of 1.0 at which there is no more "money left on the table" with regard to the tax-deductibility of interest and is consistent with Graham (2000), who reports that the average firm tends to be substantially underleveraged – the mean *KINK* in his sample is 2.356. We also note that mean *KINK* for the subset of sample firms in which *EPS*EPSDILUTION* equals one (zero) is 3.349 (4.300). We thus conclude that while managerial fixation on EPS dilution

significantly reduces the degree of firms' debt conservatism, as demonstrated in Table 8, it does not, on average, appear to result in overleveraging. These findings complement those of Young and Yang (2011), who find that stock repurchase activity associated with EPS-contingent compensation provides net benefits to shareholders.

5 Conclusions

In this paper, we explore contracting and behavioral explanations for managers' supposedly irrational tendency to avoid EPS dilution when making capital structure decisions. Because we focus heavily on the role that EPS-based compensation might play in this phenomenon, we first examine the economic factors that influence the decision to use EPS versus other performance measures in bonus contracts. We find that the firms that choose to reward executives on EPS performance tend to be larger, more established firms and are characterized by a greater degree of agency conflict between managers and shareholders. After controlling for endogeneity in compensation policy and for other determinants of debt-equity issuances, we find that EPS dilution significantly affects financing choice when executives are explicitly compensated on EPS performance. We also find that clientele effects related to transient institutional ownership levels contribute to the phenomenon, but our results linking investor sentiment to an avoidance of EPS dilution were sensitive to several research design choices. We also report evidence that using EPS as a performance measure in bonus contracts and the resulting managerial fixation on reported EPS alleviate underleveraging, as indicated by firms' speed of adjustment to target leverage ratios and debt conservatism levels.

There are limitations to our analysis. First, we dichotomize our sample into firms that explicitly reward executives on EPS performance and those that do not, based on information

provided in proxy statements filed with the SEC. It is possible that firms do use EPS in determining bonus compensation, but do not disclose this information in their proxy statements. On a related note, we assume that bonus compensation mainly reflects earnings and EPS performance. While this assumption is well-supported in prior research, bonus compensation could potentially be affected by stock price performance, as well as by non-financial measures of performance. To the extent that either or both of the above situations apply, the power of our tests will be reduced.

In addition, because of the nature of our empirical tests, we are unable to draw conclusions regarding causality – we document significant associations between the use of EPS-based compensation and managerial aversion to earnings dilution. We also acknowledge that, as with all empirical research, there is the possibility that our results might be affected a correlated omitted variable that explains both the financing choice and compensation policy. Future research might address whether the use of EPS-based compensation influences other corporate decisions, such as M&A transactions, or how compensation committees choose between EPS-based and equity-based compensation to best align managerial incentives with those of shareholders.

Appendix

The effect of debt and equity issues on reported EPS

The relative effect of a debt versus an equity issue on reported EPS depends on the relation between the firm's E/P ratio and the after-tax cost of debt. To illustrate, assume that at the beginning of the year the firm finances a project by issuing either debt or equity, where the amount of financing equals the stock price at the beginning of the year, P_{t-1}, times the number of shares issued, N.[22] In the case of a debt issue, reported EPS at the end of the year may be expressed as $\frac{E - r_d NP_{t-1}}{Shares_{t-1}}$ where E is annual earnings before interest on the debt issued, r_d is the after-tax interest rate on the debt, and $Shares_{t-1}$ equals the number of common shares outstanding (or common share equivalents, in the case of diluted EPS) at the beginning of the year. In the case of an equity issue, reported EPS at the end of the year is simply $\frac{E}{Shares_{t-1} + N}$.

Reported EPS will be higher when debt financing is used instead of equity financing whenever the following holds:

$$\frac{E - r_d NP_{t-1}}{Shares_{t-1}} > \frac{E}{Shares_{t-1} + N}. \tag{A.1}$$

Algebraic manipulation yields the following relation:

$$\frac{E}{(Shares_{t-1} + N)} \frac{1}{P_{t-1}} > r_d. \tag{A.2}$$

Note that the first term, $\frac{E}{Shares_{t-1} + N}$, is reported EPS assuming an equity issue. Eq. (A.2) indicates that an equity issue will result in lower reported EPS, relative to a debt issue, whenever the EPS-to-price ratio after the equity issue is greater than the after-tax cost of debt.

Alternatively, we may express Eq. (A.2) as:

$$\frac{E^*}{Shares_{t-1}} \frac{1}{P_{t-1}} > r_{d.} \tag{A.3}$$

where $\frac{E^*}{Shares_{t-1}} = \frac{E - r_d NP_{t-1}}{Shares_{t-1}}$, or reported EPS assuming a debt issue. Eq. (3) indicates that a debt issue will result in higher reported EPS, relative to an equity issue, whenever the EPS-to-price ratio after the debt issue is higher than the after-tax cost of debt. Note that with both equity and debt issues, the relevant E/P ratio is annual reported EPS divided by stock price at the time of the issue. We conclude from Eqs. (A.2) and (A.3) that, for financial reporting purposes, debt financing is favorable to equity financing whenever this E/P ratio is higher than the after-tax cost of debt.

Also note that the relations in Eqs. 2 and 3 apply to both basic and diluted EPS; that is, $Shares_{t-1}$ may reflect either common shares outstanding or common share equivalents outstanding. In terms of our research design, we should ideally use the measure that appears in executives' bonus contracts. Firms do not typically distinguish between basic and diluted EPS in their discussion of compensation policies; however, we note that diluted EPS is the metric mentioned in all instances where they do make this distinction. We therefore assume throughout the paper that diluted EPS, not basic, is the performance measure used whenever EPS is listed as a determinant of bonus compensation and use annual diluted EPS in our empirical tests when determining whether debt or equity is the more dilutive financing choice.

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Footnotes

[1] "Earnings dilution" typically refers to the reduction in reported earnings per share (EPS) that occurs through the issuance of additional common shares or the conversion of convertible securities. We use the terms "earnings dilution" and "EPS dilution" interchangeably throughout the paper.

[2] See "SEC Approves Tougher Rules on Executive Pay," *The New York Times*, 12/17/2009.

[3] The Office of Federal Housing Enterprise Oversight's (OFHEO) now-famous 2006 report sharply criticized Fannie Mae's over-reliance on EPS in determining executive pay. According to the report, "Fannie Mae tied major portions of executive compensation to EPS, a metric easily manipulated by management." The report also states, "Fannie Mae's executives were precisely managing earnings to the one-hundredth of a penny to maximize their bonuses while neglecting investments in systems internal controls and risk management," and Fannie Mae's reaching of announced targets for EPS each quarter "were illusions deliberately and systematically created by senior management with the aid of inappropriate accounting and improper earnings management."

[4] Bushman and Smith (2001, p. 284) make a similar argument, observing that "executives likely understand the mapping from their actions to accounting numbers better than the mapping from actions to equity value."

[5] Graham and Harvey (2001) note that avoiding EPS dilution seems to be particularly important to CFOs working in regulated industries. We omit financial institutions to ensure consistency with prior research; however, we may be reducing the power of our tests if these firms are more likely than other firms to reward executives on EPS performance.

[6] These definitions of net debt and equity issued may include convertible debt or preferred stock, which may introduce error into our model of debt-equity choice. As a sensitivity test, we omit observations where either preferred stock (Compustat data item #130) or convertible debt (data item #79) increases by more than 5% of total assets during the fiscal year. We find that eliminating these observations (12 preferred stock issues and 74 convertible debt issues) does not qualitatively change our findings.

[7] As a sensitivity test, we add back the dual issuers and repeat our analysis; our results are robust to their inclusion.

[8] Many of these firms were ADRs. We also note that proxy statements are increasingly available via SEC Edgar during the later years of our sample period.

[9] We note that Ittner et al. (1997) find that both utilities and firms that follow innovative organizational strategies are more likely to choose non-financial performance measures in their bonus contracts, consistent with our descriptive evidence from Table 1, where we find an inverse relation between the use of EPS and non-financial measures.

[10] We use simulated marginal tax rates as calculated by Graham and Mills (2008) using financial statement data, which are highly correlated with marginal rates based on actual tax returns. We thank John Graham for providing data on marginal tax rates. When these data are not available, we use Graham and Mill's (2008) "PseudoStatutory" variable, which they show is a second-best alternative to their simulated rates.

[11] We assume a pure cubic function in relating credit ratings to yields because it appears to effectively capture the convex relationship between credit ratings and yields documented by John et al. (2003) and can be fitted using with only two data points. To illustrate, John et al. (2003) show that the average spread between AAA and BBB rated debt is 50-60 basis points, while the spread between BBB and CCC is over 500 points. If we assume a pure cubic function where x is the numerical credit rating from Compustat, ranging from 1-29, and y is the spread between AAA and BBB rated debt, the spread will equal the rating cubed times a coefficient (we subtract 2 from each rating so that the rating for AAA rated debt will equal 0 and run through the origin), or spread = ax^3. Using 60 basis points as the spread and an x-value of 9 (11 minus 2), the coefficient equals 60/729, or 0.0823. Applying this relation to CCC rated debt results in an estimated yield of 0.0823 times $(20\text{-}2)^3$, or 480 basis points, which is close to the spreads that John et al. (2003) report for CCC rated debt. We also applied a linear model to estimate yields; our results are insensitive to this design choice.

[12]Credit ratings are available for 809 of our 1,493 observations. Our findings are robust to omitting observations with missing ratings.

[13]*EPSDILUTION* may also capture firms' growth prospects or market timing effects. However, we explicitly control for these effects by including firms' market-to-book ratios and prior stock returns Eq. (2). Another possibility is that *EPSDILUTION* reflects the relative cost of debt to equity, if one views E/P as a rough proxy for the cost of equity capital. To address this issue, we redefine *EPSDILUTION* by replacing E/P with Easton's (2004) cost of capital measure, which Botosan and Plumee (2005) document as being most highly associated with known valuation risk factors. If *EPSDILUTION* is proxying for relative financing costs, we expect this new variable to be more strongly associated with financing choice than our original measure. In untabulated analysis, we find that this variable is not a significant determinant of debt-equity choice, which suggests that *EPSDILUTION* is unlikely to be proxying for relative financing costs in this setting.

[14] Ai and Norton (2003) have demonstrated difficulties in interpreting the estimated coefficients on interaction terms in nonlinear models, and Norton et al. (2004) present a methodology for adjusting the marginal effects on interaction terms. However, recent work by Greene (2010) and Kolasinksi and Siegel (2010) have concluded that these adjustments are inappropriate. We therefore present our main results without the Norton et al. (2004) adjustments.

[15] We thank Brian Bushee for providing transient institutional ownership data. The Baker and Wurgler (2006) index captures six investor sentiment proxies, including the closed-end fund discount, share turnover, average first day initial public offering returns, number of initial public offerings, share of equity issues in total debt and equity issues, and the dividend premium. *SENTIMENT* is the first principal component of the six sentiment proxies that have been orthogonalized with respect to a set of macroeconomic variables. We obtain this data from the following website: http://pages.stern.nyu.edu/~jwurgler/.

[16]Using a sample of 5,980 firm-years over 1993-2005, we estimate target leverage as a function of lagged market-to-book ratios, stock returns, return on assets, net operating loss carryforwards, tangible asset intensity, R&D expenditures, selling expenses, and industry median debt ratios. We generally find that these variables are associated with leverage ratios in the predicted fashion –*MB*, *RET, ROA*, *SG&A*, and *R&D* are negatively related to leverage ratios, while *SIZE*, *PPE, NOLC*, and *INDLEV* are positively related to leverage ratios. Results of our target leverage estimation are available upon request.

[17] As an alternative to *ISSUESIZE*, we include the variable %*STOCK*, defined as the number of shares that would be issued for a given amount of financing, divided by the number of shares outstanding at the beginning of the year. To obtain the number of shares issued, we divide the dollar amount of the debt or equity issue by the average share price over the year. While these two variables are very highly positively correlated (ρ=0.83), the use of the former variable helps to more clearly distinguish the effects of EPS dilution from other effects related to the issuance of new common shares. In untabulated analysis, we report a significantly negative estimated coefficient on *%STOCK*, but our inferences regarding H1-H3 remain unchanged.

[18] While dual issuers are omitted from the sample, only observations in which there is both a debt and an equity offering that each exceed 5% of total assets are eliminated. For example, a firm that in the same fiscal year issues debt (equity) that exceeds 5% of assets and equity (debt) that is less than 5% of total assets would be retained in the sample. This calculation results in a continuously distributed dependent variable with a mean (median) of 0.481 (0.586), which allows the use of 2SLS.

[19] Our results are robust to using CEO compensation instead of the average of the top five executives' compensation.

[20] Managers' existing stock and option holdings may also influence financing decisions, as they help to align executives' interests with those of shareholders. In addition, option holdings could affect our results if their exercise is used as an alternative tax shield to debt financing (see Graham et al. 2004). As a robustness test, we add executives' existing holdings of stock and options, estimated using the methodology outlined in Core and Guay (1999), as a control variable in our main analysis; our results are robust to its inclusion.

[21] We thank John Graham for providing "kink" data.

[22] The example can be easily generalized to allow the financing event to occur at any time during the fiscal year.

References

Ai, C., & Norton, E.C. (2003). Interaction terms in logit and probit models. *Economics Letters*, *80*, 123-129.

Armstrong, C., Guay, W., & Weber, J. (2010). The role of information and financial reporting in corporate governance and debt contracting. *Journal of Accounting and Economics, 50* (2-3), 179-324.

Ashbaugh-Skaife, H., Collins, D., & LaFond, R. (2006). The effects of corporate governance on firms' credit ratings. *Journal of Accounting and Economics, 42*, 203-243.

Baker, M., & Wurgler, J. (2000). The equity share in new issues and aggregate stock returns. *Journal of Finance*, *55*, 2219-2257.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance*, *57*, 1-32.

Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Journal of Finance, 61*, 1645-1680.

Baker, M., Ruback, R., & Wurgler, J. (2007). Behavioral corporate finance: A survey. *Handbook of Corporate Finance: Empirical Corporate Finance*.

Banker, R., Huang, R. & and Natarajan, R. (2009). Incentive contracting and the value relevance of earnings and cash flows. *Journal of Accounting Research*, 47, 647-678.

Bens, D., Nagar, V., & Wong, F. (2002). Real investment implications of employee stock option exercises. *Journal of Accounting Research*, *40*, 359-393.

Bens, D., Nagar, V., Skinner, D. & and Wong, F. (2003). Employee stock options, EPS dilution, and stock repurchases. *Journal of Accounting and Economics, 36,* 51-90.

Berger, P., Ofek, E., & Yermack, D. (1997). Managerial entrenchment and capital structure decisions. *Journal of Finance, 52*, 1411-1438.

Bergman, N. K., & Roychowdhury, S. (2008). Investor sentiment and corporate disclosure. *Journal of Accounting Research 46,* 1057-1083.

Bhushan, R. (1989). Firm characteristics and analyst following. *Journal of Accounting and Economics, 11*, 255-274.

Binsbergen, J., Graham, J. & Yang, J. (2010). The cost of debt. *Journal of Finance*, *65*, 2089-2136.

Botosan, C. & Plumlee, M. (2005). Assessing alternative proxies for the expected risk premium. *The Accounting Review, 80*, 21-54.

Brealey, R., Myers, S., & Allen, F. (2007). *Principles of Corporate Finance*. McGraw-Hill, New York, NY.

Brown, N., Christensen, T., Elliott, W., & Mergenthaler, R. (2012). Investor sentiment and pro forma earnings disclosures. *Journal of Accounting Research, 50*, 1-40.

Bruggen, A., & Moers, F. (2007). The role of financial incentives and social incentives in multi-task settings. *Journal of Management Accounting Research, 19*, 25-50.

Bushee, B. (1998). The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review, 73*, 305-333.

Bushee, B. (2001). Do institutional investors prefer near-term earnings over long-run value? *Contemporary Accounting Research, 18*, 207-247.

Bushman, R, Chen, Q., Engel, E., & Smith, A. (2004). Financial accounting information, organizational complexity, and corporate governance systems. *Journal of Accounting and Economics, 37,* 167-201.

Bushman, R., Engel, E., & Smith, A. (2006). An analysis of the relation between the stewardship and valuation roles of earnings**.** *Journal of Accounting Research, 44,* 53-83.

Bushman, R., & Smith, A. (2001). Financial accounting information and corporate governance. *Journal of Accounting and Economics, 32*, 237-333.

Byoun, S. (2008). How and when do firms adjust their capital structures toward targets? *Journal of Finance, 53*(6), 3069-3096.

Carter, M.E., Lynch, L. & Tuna, I. (2007). The role of accounting in the design of CEO equity compensation. *The Accounting Review, 82*, 327-357.

Carter, M.E.; Lynch, L., & Zechman, S. (2009). Changes in bonus contracts in the post-Sarbanes-Oxley era. *Review of Accounting Studies, 14*, 480-506.

Chang, X., Dasgupta, S. & Hilary, G. (*2009*). The effect of auditor quality on financing decisions. *The Accounting Review*, *84* (4), 1085-1117.

Cheng, S. (2004). R&D expenditures and CEO compensation. *The Accounting Review, 79*, 305-328.

Cheng, Q., & Warfield, T. (2005). Equity incentives and earnings management. *The Accounting Review, 80,* 441-476.

Cohen, D.; A. Dey; & Lys, T. (2011). Corporate governance reform and executive incentives: Implications for investments and risk taking. Forthcoming in *Contemporary Accounting Research*.

Core, J., & Guay, W. (1999). The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics, 28*, 151–184.

Core, J., W. Guay, & Verrecchia, R. (2003). Price versus non-price performance measures in optimal CEO compensation contracts. *The Accounting Review, 78*, 957-981.

Dash, E. (2011). Stock-hedging lets bankers skirt efforts to overhaul pay. *The New York Times*, Feb. 5, B1.

Davila, A., & Penalva, F. (2006). Governance structure and the weighting of performance measures in CEO compensation. *Review of Accounting Studies, 11*, 463-493.

Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *Journal of Political Economy*, *93*, 1155-1177.

Dey, A. (2008). Corporate governance and agency conflicts. *Journal of Accounting Research, 46,* 1143-1181.

Easton, P. (2004). PE ratios, PEG ratios, and estimating the implied expected rate of return on equity capital. *The Accounting Review, 79* (1), 73-95.

Efendi, J., Srivastava, A., & Swanson, E. (2007). Why do firms misstate financial statements? The role of option compensation and other factors. *Journal of Financial Economics,* 667-708.

Fama, E. (1980). Agency problems and the theory of the firm. *Journal of Political Economy, 88*, 288-307.

Francis, J., & Smith, A. (1995). Agency costs and innovation: Some empirical evidence. *Journal of Accounting and Economics*, *19,* 383-409.

Gaver, J.; & Gaver, K. (1998). The relation between nonrecurring accounting transactions and CEO cash compensation. *The Accounting Review, 73*, 235-352.

Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics, 118*, 107-155.

Graham, J. (1996). Debt and the marginal tax rate. *Journal of Financial Economics, 41*, 41-73.

Graham, J. (2000). How big are the tax benefits of debt? *Journal of Finance, 5,* 1901–1942.

Graham, J., & Harvey, C. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics, 60,* 187-243.

Graham, J., Lang, M. & Shackelford, D. (2004). Employee stock options, corporate taxes and debt policy. *Journal of Finance, 59*, 585-1618.

Graham, J., & Mills, L. (2008). Using tax return data to simulate corporate marginal tax rates. *Journal of Accounting and Economics*, *46,* 366-388.

Greene, W. (2010). Testing hypotheses about interaction terms in non-linear models. *Economic Letters, 107*, 291-296.

Hall, B., & Leibman, J. (1998). Are CEOs really paid like bureaucrats? *The Quarterly Journal of Economics, 103*, 653–691.

Hand, J. R. (1989). Did firms undertake debt-equity swaps for an accounting paper profit or true financial gain? *The Accounting Review, 64*, 587-623.

Harvey, C., Lins, K., & Roper, A. (2004). The effect of capital structure when expected agency costs are extreme. *Journal of Financial Economics*, *74*, 3-30.

Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics, 7*, 85-107.

Holmstrom, B., & Milgrom, P. (1991). Multi-task principal-agent analyses: Incentive contracts, asset ownership and job design. *Journal of Law, Economics and Organization*, *7*, 24-52.

Holthausen, R., Larcker, D., & Sloan, R. (1995). Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics, 19*, 29-74.

Hoppe, F., & Moers, F. (2008). Bonus contracts, private information, and CEO turnover. Working paper, Maastricht University.

Hovakimian, A., Opler, T., &Titman, S. (2001). The debt-equity choice. *Journal of Financial and Quantitative Analysis, 36*, 1-24.

Hribar, P., Jenkins, N., &Johnson, W.B. (2006). Stock repurchases as an earnings management device. *Journal of Accounting and Economics, 41*, 3-27.

Ittner, C., Larcker, D. & Rajan, M. (1997). The choice of performance measures in annual bonus contracts. *The Accounting Review, 72*, 231-255.

Jensen, M. (1986). Agency cost of free cash flows, corporate finance, and takeovers. *American Economic Review*, *76*, 323-329.

Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and capital structure. *Journal of Financial Economics, 3,* 305-360.

John, K., Lynch, A., & Puri, M. (2003). Credit ratings, collateral, and loan characteristics: implications for yield. *Journal of Business, 76*, 371-409.

Kayhan, A., & Titman, S. (2007). Firms' histories and their capital structures. *Journal of Financial Economics, 83*, 1-32.

Kim, D., & Yang, J. (2010). Beating the target: A closer look at annual incentive plans. Working paper, Indiana University.

Kisgen, D. (2006). Credit ratings and capital structure. *Journal of Finance, 61*, 1035-1072.

Klassen, K. (1997). The impact of insider ownership concentration on the trade-off between financial and tax reporting. *The Accounting Review*, *72,* 455-474.

Kolasinksi, A., & Siegel, A. (2010). On the economic meaning of interaction term coefficients in non-linear binary response regression models. Working paper, University of Washington and National Bureau of Economic Research.

Lambert, R., & Larcker, D. (1987). An analysis of the use of accounting and market measures of performance in executive compensation contracts. *Journal of Accounting Research, 25*, 85-129.

Lang, M., Lins, K., & Miller, D. (2004). Concentrated ownership, analyst following, and valuation: Do analysts matter most when investors are protected least?" *Journal of Accounting Research, 42,* 589-623.

Larcker, D. (2003). Discussion of 'Are executive stock options associated with future earnings?' *Journal of Accounting and Economics, 36,* 91-103.

Larcker, D., Richardson, S., & Tuna, I. (2007). Corporate governance, accounting outcomes, and organizational performance. *The Accounting Review*, *82*, 963–1008.

Malmendier, U., Tate, G., & Yan, J. (2011).Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *Journal of Finance, 66*, 1687-1733.

Marquardt, C., & Wiedman, C. (2005). Earnings management through transaction structuring: Contingent convertible debt and diluted earnings per share. *Journal of Accounting Research, 43*, 205-243.

Matsumoto, D. (2002). Management's incentives to avoid earnings surprises. *The Accounting Review, 77*, 483-514.

McAnally, M., Srivastava, A. & Weaver, C. (2008). Executive stock options, missed earnings targets, and earnings management. *The Accounting Review*, *83*(1),185-216.

Mehran, H. (1992). Executive incentive plans, corporate control, and capital structure. *Journal of Financial and Quantitative Analysis, 27,* 539-560.

Modigliani, F., & Miller, M. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review, 48*, 261-297.

Murphy, K., & Jensen, M. (2011). CEO bonus plans and how to fix them. Working paper, University of Southern California and Harvard University.

Myers, S. (1984). The capital structure puzzle. *Journal of Finance, 39*, 575-592.

Myers, J., Myers, L., & Skinner, D. (2007). Earnings momentum and earnings management. *Journal of Accounting Auditing and Finance, 22*, 249-284.

Norton, E., Wang, H. & Ai, C. (2004). Computing interaction effects and standard errors in logit and probit models. *The Stata Journal*, 103-116.

Ofek, E., & Yermack, D. (2000). Taking stock: Equity-based compensation and the evolution of managerial ownership. *Journal of Finance*, *55,* 1367-1384.

Rajgopal, S., Shivakumar, L., & Simpson, A. (2007). A catering theory of earnings management. Working paper, University of Washington, London Business School, and London School of Economics.

Rosenberg, H. (2001). Building a better carrot. *CFO*, *17*(7), 64-68.

Skinner, D. (1993). The investment opportunity set and accounting procedure choice: Preliminary evidence. *Journal of Accounting and Economics, 16*, 407-445.

Sloan. R. (1993). Accounting earnings and top executive turnover. *Journal of Accounting and Economics*, *16*, 55-100.

Smith, C., & Watts, R. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics, 32,* 263-292

Watts, R., and J. Zimmerman. (1986). *Positive accounting theory*. New York, NY: Prentice-Hall.

Wooldridge, J.M. (2002). *Econometric analysis of cross section and panel data*. Cambridge, MA: MIT Press.

Young, S., & Yang, J. (2011). Stock repurchases and executive compensation contract design: The role of earnings per share performance conditions. *The Accounting Review*, *86*, 703-33.

Table 1 Performance measures used in annual bonus contracts, as reported by sample firms in 2005

Panel A: Frequency of firms using each performance measure (n=165)

	N	%
Earnings per share	74	44.8
Revenue	69	41.8
Operating income/Profit before tax/EBIT/EBITDA	61	37.0
Non-financial	55	33.3
Accounting Returns (ROIC/ROA/ROE)	49	29.7
Cash flow/ Free cash flow	32	19.4
Net income	30	18.2
Operating margin	8	4.8
Share price/Total shareholder return	8	4.8
EVA	7	4.2
Expense/Cost reduction	4	2.4
Other	25	15.2
Not disclosed	14	8.5
Total number of bonus plans	165	

	Mean	Q1	Median	Q3
Number of measures used	2.79	2.0	2.0	4.0

Panel B: Chi-squared tests of differences in frequencies of reported performance measures, conditional on the use of EPS (n=151)

	EPS used (n=74)	EPS not used (n=77)	p-value
Revenue	34	35	0.95
Operating income/Profit before tax/EBIT/EBITDA	**14**	**47**	**<0.01**
Non-financial	**21**	**34**	**0.04**
Accounting Returns (ROIC/ROA/ROE)	**33**	**16**	**<0.01**
Cash flow/ Free cash flow	17	15	0.60
Net Income	13	17	0.49
Operating margin	4	4	0.96
Share price/Total shareholder return	6	2	0.13
EVA	**1**	**6**	**0.06**
Expense/Cost reduction	1	3	0.33
Other	13	12	0.74

	Mean	Q1	Median	Q3
Number of measures, EPS used	3.10	2.0	3.0	4.0
Number of measures, EPS not used	2.48	1.0	2.0	3.0

This table presents performance measures used in executives' bonus compensation contracts, as disclosed in proxy statements filed with the SEC. Firms that did not disclose explicit performance measures are excluded from Panel B. P-values are based on two-tailed tests.

Table 2 Univariate tests of determinants of the use of EPS performance in annual bonus contracts

	Combined Sample (N=1,493)		EPS=1 Subsample (N=581)		EPS=0 Subsample (N=912)		T-test for difference in means	Wilcoxon test for difference in medians
	Mean	Median	Mean	Median	Mean	Median	p-value	p-value
SIZE	7.083	7.005	**7.496**	**7.410**	**6.872**	**6.761**	**<0.01**	**<0.01**
COMPLEXITY	0.643	0.693	**0.750**	**0.899**	**0.588**	**0.547**	**<0.01**	**<0.01**
FCF	0.043	0.047	**0.055**	**0.055**	**0.037**	**0.042**	**<0.01**	**<0.01**
DEBTPAYMENT	0.035	0.026	0.035	0.027	0.034	0.024	0.61	0.29
DIVYIELD	0.010	0.007	**0.011**	**0.008**	**0.009**	**0.006**	**<0.01**	**<0.01**
MB	2.202	1.734	2.184	1.690	2.241	1.716	0.29	<0.01
MGRSHARES	0.072	0.013	**0.054**	**0.009**	**0.076**	**0.016**	**<0.01**	**<0.01**
TRANSIENT	0.194	0.173	0.199	0.174	0.186	0.162	0.04	0.25
ENTRENCHED	0.082	0.093	0.169	0.125	0.068	0.069	0.22	0.35
ETR	0.256	0.350	0.319	0.350	0.220	0.348	0.04	0.17
REGULATION	0.001	0.000	0.000	0.000	0.001	0.000	0.52	0.50
R&D	0.066	0.026	**0.045**	**0.023**	**0.079**	**0.031**	**<0.01**	**<0.01**
COVERAGE	10.328	8.000	**10.542**	**9.000**	**10.206**	**8.000**	**0.03**	**<0.01**
NOISE	0.020	0.004	0.014	0.003	0.022	0.004	0.37	0.21

This table presents descriptive statistics for a sample of 1,493 firm-years for which the proxy statement contains information on bonus plans for the top-five executives and where net debt or equity issues exceed 5% of total assets over the period 1993 to 2005. The EPS=1 (EPS=0) subsample includes firms with bonus contracts that are (not) explicitly based on EPS. *SIZE* is the log of sales. *COMPLEXITY* is the log of the number of reporting segments. *FCF* is free cash flows, defined as operating cash flows minus capital expenditure, divided by total assets. *DEBTPAYMENT* is interest payments and the current portion of long-term debt, scaled by total assets. *DIVYIELD* is annual cash dividends over year-end share price. *MB* is market-to-book ratio, defined as (total assets – book value of equity + market value of equity) / total assets. *MGRSHARES* is the percentage of outstanding stock owned by the top 5 executives. *TRANSIENT* represents transient institution ownership obtained from Bushee (1998). *ENTRENCHED* represents a weighted index of the following four variables: the Gompers et al. (2003) measure of shareholder rights; the proportion of executives that serve on the board of directors; an indicator variable that equals one if the CEO is also the chairman of the board; and the number of board meetings. *ETR* is income tax expense over pretax income. *REGULATION* is an indicator variable that equals 1 if the firm is a utility or telecommunications company and 0 otherwise. R&D is research and development expenses divided by sales. *COVERAGE* is the number of analysts providing earnings forecasts for the firm. *NOISE* is the ratio of time-series variance of ΔEPS to time-series variance of return from 1993 to 2005. P-values are based on two-tailed tests.

Table 3 Probit regression of determinants of the use of EPS performance in annual bonus contracts

$$EPS_{i,t} = \gamma_0 + \gamma_1 SIZE_{i,t-1} + \gamma_2 COMPLEX_{i,t-1} + \gamma_3 FCF_{i,t-1} + \gamma_4 DEBTPAYMENT_{i,t-1} + \gamma_5 DIVIDENDS_{i,t-1} + \gamma_6 MB_{i,t-1} + \gamma_7 MGSHARES_{i,t-1} + \gamma_8 TRANSIENT_{i,t-1} + \gamma_9 ENTRENCHED_{i,t-1} + \gamma_{10} ETR_{i,t-1} + \gamma_{11} REGULATION_{i,t-1} + \gamma_{12} R\&D_{i,t-1} + \gamma_{13} COVERAGE_{i,t-1} + \gamma_{14} NOISE_{i,t-1} + \gamma_{15} YEARIND_t + \varepsilon_t$$

Variable	Predicted Sign	Estimated Coefficient	p-value
Intercept	?	-0.743	0.01
SIZE $_{t-1}$	**+**	**0.130**	**<0.01**
COMPLEXITY $_{t-1}$	**+**	**0.254**	**0.02**
FCF $_{t-1}$	**+**	**2.755**	**0.03**
DEBTPAYMENT $_{t-1}$	+	0.022	0.84
DIVYIELD $_{t-1}$	**+**	**0.205**	**0.04**
MB $_{t-1}$	**-**	**-0.053**	**0.10**
MGRSHARES $_{t-1}$	-	-0.004	0.46
TRANSIENT $_{t-1}$	**+**	**0.342**	**0.05**
ENTRENCHED $_{t-1}$	+	-0.042	0.46
ETR $_{t-1}$	**+**	**0.241**	**0.04**
REGULATION $_{t-1}$	-	-1.694	0.86
R&D $_{t-1}$	**-**	**-2.414**	**0.08**
COVERAGE $_{t-1}$	**+**	**0.030**	**0.05**
NOISE $_{t-1}$	-	**-0.426**	**0.10**
Pseudo-R^2		0.189	
N		1,493	

This table reports estimation results from a probit regression, where the dependent variable *EPS* equals 1 for firms with bonus contracts that are explicitly based on EPS and 0 for firms with bonus contracts that are not. The independent variables are defined in Table 2; predicted signs are consistent with an agency conflict interpretation for each variable. Year and industry dummies are included. P-values are based on two-tailed tests.

Table 4 Firm characteristics of debt-equity issuers, conditional on the use of EPS performance in annual bonus contracts

	Combined Sample (N=1,493)		EPS=1 Subsample (N=581)		EPS=0 Subsample (N=912)		T-test for difference in means	Wilcoxon test for difference in medians
	Mean	Median	Mean	Median	Mean	Median	p-value	p-value
EPSDILUTION	**0.452**	**0.000**	**0.516**	**1.000**	**0.418**	**0.000**	**<0.01**	**<0.01**
SENTIMENT	0.301	0.158	0.280	0.158	0.313	0.158	0.27	0.30
TRANSIENT	0.194	0.173	0.199	0.174	0.186	0.162	0.04	0.25
DEVIATION	**0.055**	**0.048**	**0.071**	**0.062**	**0.046**	**0.032**	**<0.01**	**<0.01**
RET	0.374	0.197	0.343	0.174	0.392	0.248	0.15	0.05
ROA	**0.153**	**0.153**	**0.148**	**0.150**	**0.162**	**0.156**	**<0.01**	**<0.01**
NOLC	**0.093**	**0.001**	**0.056**	**0.001**	**0.112**	**0.001**	**<0.01**	**0.10**
MB>1 DUMMY	**0.947**	**1.000**	**0.939**	**1.000**	**0.960**	**1.000**	**0.05**	**0.06**
ISSUESIZE	**0.075**	**0.051**	**0.064**	**0.045**	**0.080**	**0.055**	**0.07**	**0.06**
CREDITΔ	0.313	0.000	0.379	0.000	0.278	0.000	0.17	0.21

This table presents descriptive statistics for a sample of 1,493 firm-years for which the proxy statement contains information on bonus plans for the top-five executives and where net debt or equity issues exceed 5% of total assets. The EPS=1 (EPS=0) subsample includes firms with bonus contracts that are (not) explicitly based on EPS. *EPSDILUTION* is an indicator variable that equals one when the E/P ratio exceeds the after-tax cost of debt, and zero otherwise. *SENTIMENT* is the first principal component of the six sentiment proxies that have been orthogonalized with respect to a set of macroeconomic variables (see Baker and Wurgler 2006). *DEVIATION* is the difference between actual and target leverage, where target leverage is estimated from a first stage tobit regression (see footnote 14). *RET* is the split-and dividend-adjusted return from the beginning of the pre-issue year until close of the issue year. *ROA* is earnings before interest, taxes, depreciation, and amortization, divided by the book value of assets, averaged over the previous three-year period. *NOLC* is the net operating loss carry forward scaled by total assets. *MB>1DUMMY* is an indicator variable that equals one if the market-to-book ratio is greater than one, and zero otherwise. *ISSUESIZE* is sum of the net debt and net equity issued. *CREDITΔ*, which is an indicator variable that equals one if the firm's average S&P credit rating includes a plus or minus sign and zero otherwise. P-values are based two-tailed tests.

Table 5 Estimation results from a model of debt-equity choice on EPS dilution, contracting and behavioral variables, and controls

$$P(DEBTISSUE_{i,t}) = \beta_0 + \beta_1 EPSDILUTION_{i,t} + \beta_2 EPS_{i,t} + \beta_3 EPS_{i,t} * EPSDILUTION_{i,t} + \beta_4 SENTIMENT_{i,t} + \beta_5 SENTIMENT_{i,t} * EPSDILUTION_{i,t} + \beta_6 TRANSIENT_{i,t} + \beta_7 TRANSIENT_{i,t} * EPSDILUTION_{i,t} + CONTROLS_{i,t} + \beta YEARIND_{i,t} + \eta_{i,t}$$

		(1) Probit		(2) Two-Stage Wooldridge		(3) 2SLS	
	Predicted Sign	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept		0.256	0.48	0.173	0.13	0.085	0.23
EPSDILUTION	**+**	**0.427**	**0.01**	**5.013**	**0.01**	**0.498**	**0.02**
Contracting Variables							
EPS	+	0.518	0.02	2.016	0.01	0.389	0.02
EPS *EPSDILUTION (H1)	**+**	**0.329**	**0.02**	**2.064**	**0.01**	**0.671**	**<0.01**
Behavioral Variables							
SENTIMENT	-	-0.371	0.04	-0.298	0.04	-0.281	0.05
SENTIMENT*EPSDILUTION (H2)	**-**	**-0.206**	**0.07**	**-0.348**	**0.06**	**-0.204**	**0.08**
TRANSIENT	+	0.961	0.01	0.969	0.01	1.736	0.01
TRANSIENT*EPSDILUTION (H3)	**+**	**1.026**	**0.06**	**1.997**	**0.03**	**2.199**	**<0.01**
Control Variables							
DEVIATION	-	-2.955	<0.01	-3.003	<0.01	-2.647	0.01
MB	-	-0.174	<0.01	-0.146	<0.01	-0.413	<0.01
RET	-	-0.119	<0.01	-0.272	<0.01	-0.094	0.03
ROA	-	-4.479	<0.01	-3.794	0.02	-6.744	<0.01
NOLC	-	-0.381	0.04	-0.402	0.01	-0.197	0.62
$MB_t > 1$ *DUMMY*	-	-0.179	0.55	-0.228	0.35	-0.420	0.56
ISSUESIZE	-	-1.105	<0.01	-1.284	<0.01	-1.185	<0.01
CREDITΔ	-	-0.220	0.31	-0.439	0.05	-0.076	0.13
Pseudo R^2/Adjusted R^2		0.382		0.316		0.117	
N		1,493		1,493		1,493	

This table presents results from three analyses of financing choices. Column (1) presents results from a probit regression where the dependent variable equals 1 when a debt is issued and 0 when equity is issued. Column (2) presents a two-stage method: in the first stage the predicted value of *EPS* is obtained from a probit estimation; in the second stage a probit regression is estimated using this predicted value, as in Wooldridge (2002). Column (3) presents results from a two-stage least squares (2SLS) estimation, where the first stage is the same as in column (2), and the second stage is an OLS regression where the dependent variable is defined as the ratio of the dollar amount of debt raised over the dollar amount of total capital raised. The main variables of interest are the interaction terms between *EPSDILUTION* and *EPS*, *SENTIMENT*, and *TRANSIENT*, which constitute our tests of H1, H2, and, H3, respectively. All variables are defined in Table 4. Year and industry dummies are included. P-values are based on two-tailed tests.

Table 6 Probit regression results from model of debt-equity choice on EPS dilution, contracting and behavioral variables, and controls, conditional on use of EPS performance in bonus contracts

$$P(DEBTISSUE_{i,t}) = \beta_0 + \beta_1 EPSDILUTION_{i,t} + \beta_2 BONUSCOMP_{i,t} + \beta_3 BONUSCOMP_{i,t} * EPSDILUTION_{i,t} + \beta_4 EQUITYCOMP_{i,t} + \beta_5 EQUITYCOMP_{i,t} * EPSDILUTION_{i,t} + \beta_6 SENTIMENT_{i,t} + \beta_7 SENTIMENT_{i,t} * EPSDILUTION_{i,t} + \beta_8 TRANSIENT_{i,t} + \beta_9 TRANSIENT_{i,t} * EPSDILUTION_{i,t} + CONTROLS_{i,t} + \beta\ YEARIND_{i,t} + \eta_{i,t}$$

		(1) EPS=1 Subsample		(2) EPS=0 Subsample	
	Predicted Sign	Coeff.	p-value	Coeff.	p-value
Intercept		0.312	0.36	0.719	0.45
EPSDILUTION	**+**	**0.530**	**0.02**	**0.203**	**0.24**
Contracting Variables					
BONUSCOMP	+	0.636	<0.01	0.148	0.21
BONUSCOMP*EPSDILUTION (H1)	**+/0**	**0.632**	**0.01**	**0.070**	**0.38**
EQUITYCOMP	+	0.272	0.04	0.235	0.02
EQUITYCOMP*EPSDILUTION (H1)	**0**	**0.020**	**0.52**	**0.029**	**0.24**
Behavioral Variables					
SENTIMENT	-	-0.182	0.04	-0.213	0.04
SENTIMENT*EPSDILUTION (H2)	-	**-0.122**	**0.29**	**-0.129**	**0.43**
TRANSIENT	+	3.546	<0.01	3.064	<0.01
TRANSIENT*EPSDILUTION (H3)	+	**1.246**	**0.03**	**1.331**	**0.05**
Control Variables					
DEVIATION	-	-2.003	0.02	-2.004	<0.01
MB	-	-0.188	0.01	-0.155	0.02
RET	-	-0.251	0.02	-0.149	0.02
ROA	-	-4.007	0.01	-3.072	<0.01
NOLC	-	-0.205	0.52	-0.061	0.64
MB_t > 1 DUMMY	-	-0.124	0.89	0.189	0.39
ISSUESIZE	-	-1.208	<0.01	-0.936	<0.01
CREDITΔ	-	-0.027	0.87	-0.168	0.47
Pseudo R^2/Adjusted R^2		0.365		0.400	
N		581		912	
N (debt issues)		346(59.6%)		368(40.3%)	

This table extends our contracting hypothesis (H1) to examine the effect of the magnitude of executives' bonus and equity-based compensation on financing choices. The dependent variable equals 1 when a debt is issued and 0 whenmequity is issued. The EPS=1 (EPS=0) subsample includes firms with bonus contracts that are (not) explicitly based on EPS. The main variables of interest are the interaction terms between *EPSDILUTION* and *BONUSCOMP* and *EQUITYCOMP. BONUSCOMP* is defined as the average of (bonus / salary) for the top five executives. *EQUITYCOMP*

is defined as the average of (new grants of stock options and restricted stocks / salary) for the top five executives. All other variables are defined in Table 4. Year and industry dummies are included. P-values are based on two-tailed tests.

Table 7 Probit regression results from model of debt-equity choice on EPS dilution, contracting, behavioral, and speed of adjustment variables, and controls

$$P(DEBTISSUE_{i,t}) = \beta_0 + \beta_1 EPSDILUTION_{i,t} + \beta_2 BONUSCOMP_{i,t} + \beta_3 BONUSCOMP_{i,t} * EPSDILUTION_{i,t} + \beta_4 EQUITYCOMP_{i,t} + \beta_5 EQUITYCOMP_{i,t} * EPSDILUTION_{i,t} + \beta_6 SENTIMENT_{i,t} + \beta_7 SENTIMENT_{i,t} * EPSDILUTION_{i,t} + \beta_8 TRANSIENT_{i,t} + \beta_9 TRANSIENT_{i,t} * EPSDILUTION_{i,t} + \beta_{10} POSDEVIATION_{i,t} + \beta_{11} POSDEVIATION * EPSDILUTION + \beta_{12} NEGDEVIATION_{i,t} + \beta_{13} NEGDIVATION * EPSDILUTION + CONTROLS_{i,t} + \beta YERIND_{i,t} + \eta_{i,t}$$

		Combined Sample		EPS=1 Subsample		EPS=0 Subsample	
	Predicted Sign	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept		0.597	0.15	0.425	0.16	1.160	0.05
EPSDILUTION	**+**	**2.309**	**<0.01**	**0.479**	**0.01**	**0.211**	**0.17**
Contracting Variables							
EPS	+	1.201	<0.01				
EPS *EPSDILUTION	**+**	**1.089**	**0.01**				
BONUSCOMP	+/0			0.602	0.03	0.171	0.27
BONUSCOMP*EPSDILUTION	**+/0**			**0.527**	**0.03**	**0.062**	**0.47**
EQUITYCOMP	+			0.231	0.03	0.199	0.04
EQUITYCOMP*EPSDILUTION	**0**			**0.018**	**0.51**	**0.019**	**0.23**
Behavioral Variables							
SENTIMENT	-	-0.247	0.04	-0.180	0.05	-0.187	0.06
SENTIMENT*EPSDILUTION	**-**	**-0.087**	**0.31**	**-0.079**	**0.43**	**-0.089**	**0.50**
TRANSIENT	+	3.061	<0.01	3.217	<0.01	3.009	<0.01
TRANSIENT*EPSDILUTION	**+**	**1.697**	**0.03**	**1.500**	**0.01**	**1.407**	**0.05**
Speed of Adjustment Variables							
POSDEVIATION	-	-1.169	<0.01	-1.105	<0.01	-1.947	<0.01
POSDEVIATION*EPSDILUTION	**?**	**0.197**	**0.12**	**0.137**	**0.11**	**-0.084**	**0.28**
NEGDEVIATION	-	-1.831	<0.01	-1.167	<0.01	-2.018	<0.01
NEGDEVIATION*EPSDILUTION	**?**	**-0.805**	**0.05**	**-0.830**	**<0.01**	**-0.103**	**0.17**
Controls							
MB	-	-0.124	<0.01	-0.211	<0.01	-0.114	<0.01
RET	-	-0.176	<0.01	-0.184	0.03	-0.197	<0.01
ROA	-	-4.203	<0.01	-4.451	<0.01	-3.937	<0.01
NOLC	-	-0.027	0.69	-0.188	0.40	-0.060	0.52
MB_t > 1 DUMMY	-	-0.162	0.43	-0.150	0.86	-0.105	0.40
ISSUESIZE	-	-1.054	0.01	-1.847	<0.01	-1.280	<0.01
CREDITΔ	-	-0.207	0.17	-0.305	0.37	-0.231	0.45
Pseudo-R^2		0.389		0.408		0.417	
N		1,493		581		912	

N (debt issues)	714 (47.8%)	346 (59.6%)	368 (40.3%)

This table examines whether EPS dilution affects the speed of firms' adjustment to target leverage ratios. The dependent variable equals 1 when debt is issued and 0 when equity is issued. The EPS=1 (EPS=0) subsample includes firms with bonus contracts that are (not) explicitly based on EPS. The main variables of interest are the interaction terms between *EPSDILUTION* and *POSDEVIATION* and *NEGDEVIATION*. *POSDEVIATION (NEGDEVIATION)* is defined as the positive (negative) part of *DEVIATION*, or the distance from the target leverage ratio. All other variables are defined in Table 4. Year and industry dummies are included. P-values are based on two-tailed tests.

Table 8 Tobit regression of Graham's (2000) "kink" measure of debt conservatism on contracting variables and controls

	Predicted Sign	Coeff.	p-value
Intercept		0.107	0.19
Contracting Variables			
EPS	**-**	**-0.652**	**<0.01**
EPSDILUTION	**-**	**-1.407**	**<0.01**
EPS *EPSDILUTION	**-**	**-0.827**	**<0.01**
Controls			
CEO STOCK OWNERSHIP	?	0.187	0.73
I (NO DIVIDEND)	-	-0.404	0.03
I (NEG OWNERS'EQUITY)	-	-0.451	0.01
I (NOL CARRYFORWARD)	-	-0.342	0.04
ECOST	-	-0.116	0.02
CYCLICAL	-	-0.585	0.02
ROA	+	1.989	0.03
LN(SALES)	+	0.046	0.03
Z-SCORE	+	0.151	0.01
QUICK RATIO	+	0.209	0.01
CURRENT RATIO	+	0.196	0.01
PPE-TO-ASSETS	-	-1.015	0.01
Q-RATIO	+	0.621	0.04
R&D-TO-SALES	+	1.105	0.04
ADVERTISING-TO-SALES	?	-0.192	0.30
COMPUTER IND	+	0.210	0.05
SEMICONDUCT IND	+	0.048	0.25
CHEMICAL IND	+	0.090	0.01
AIRCRAFT IND	+	0.030	0.12
OTHER SENSITIVE IND	+	0.170	0.02
Pseudo-R^2		0.457	
N		1,335	

This table examines whether the use of EPS performance in bonus contracts and its interaction with EPS dilution affects firms' debt conservatism. The dependent variable *KINK* is the amount of interest at the point where the marginal benefit function becomes downward-sloping, as a proportion of actual interest expense. *CEO STOCK OWNERSHIP* is the proportion of company stock owned by the CEO. *ECOST* is the standard deviation of the first difference in taxable earnings divided by assets, the quotient times the sum of advertising and R&D expenses divided by sales. *CYCLICAL* is the standard deviation of operating earnings divided by mean assets first calculated for each firm, then averaged across firms within 2-digit SIC codes. *ROA* is income before extraordinary items plus interest expense plus depreciation, divided by assets. *Z-SCORE* is 3.3 times the difference of operating income before depreciation and depreciation plus sales plus 1.4 times retained earnings plus 1.2 times working capital (balance sheet), divided by total assets. *QUICK RATIO* is the sum of cash and short-term investments and total receivables divided by total current liabilities. *CURRENT RATIO* is total current assets divided by total current liabilities. *Q-RATIO* is preferred stock plus market value of common equity plus net short-term liabilities, the quantity divided by assets. *R&D-TO-SALES* and *ADVERTISING-TO-SALES* are set to zero when the numerator is missing. *COMPUTER IND* is all firms with SIC code 357; *SEMICONDUCT IND* is all firms with SIC code 367; *CHEMICAL IND* comprises SIC codes 280-289; *AIRCRAFT IND* comprises SIC codes 372 and 376; and *OTHER SENSITIVE IND* comprises SIC codes 340-400, excluding 357, 367, 372, and 376. Year and industry dummies are included. P-values are based on two-tailed tests.