

Auditors' Role in Financial Contracting: Evidence from SFAS 141(R)

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ABSTRACT: We examine how auditing affects the design of financial contracts following a change in accounting standards. SFAS 141(R) requires recognition and periodic re-measurement of liabilities for contingent earnout payments incorporated in acquisition contracts. Consequently, auditors must now provide assurance on contingent earnout liabilities and directly verify whether acquiring firms are contractually obligated to make additional earnout payments to target-firm shareholders. Consistent with a financial reporting cost hypothesis, we find earnouts are used less frequently under the new standard. However, we find the presence of a high-quality auditor moderates the effects of financial reporting costs arising from earnouts under SFAS 141(R). We also document that earnout contracts are more likely to include accounting-based performance benchmarks in the presence of a high-quality auditor under SFAS 141(R). Our results provide evidence that firms trade-off expected financial reporting costs for contracting benefits which arise from expected auditor verification of accounting numbers used in financial contracts.

Key Words: acquisitions; auditors; earnouts; financial contracting

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1. Introduction

Accounting standards play an important role in shaping firms' accounting policies and financial contracts (Watts and Zimmerman 1990). Therefore, when accounting standards change, financial reporting and contracting costs can also change, affecting the design of financial contracts (e.g., Beatty et al. 2002, Frankel et al. 2008). While prior literature has examined the financial reporting incentives that shape financial contracts, there is less evidence about how auditing affects financial contracting. To date, the literature has not explored how auditing and changes in accounting standards interact in financial contracting decisions.

To address this question, we examine financial contracts used in merger and acquisition (M&A) transactions surrounding the issuance of SFAS 141(R) and how the presence of a high-quality auditor is associated with the likelihood that the contract will include an "earnout." Acquisition contracts often include an earnout provision when there is significant uncertainty surrounding the future prospects of an acquisition target's business (Kohers and Ang 2000, Datar et al. 2001, Cain et al. 2011). An earnout calls for an additional contingent future payment to target-firm shareholders payable upon achieving specified performance criteria after the M&A transaction has been completed.¹

SFAS 141(R) significantly altered financial reporting for earnout contracts, and consequently, auditors' responsibility for monitoring earnout contracts has also changed. This standard requires that acquiring firms (1) recognize a contingent earnout liability at fair value on the acquisition date, and (2) re-measure the liability each reporting period resulting in gains or

¹ In M&A transactions involving an earnout, payments to the target-firm shareholders consist of two components: first, an upfront fixed payment and second, an additional future payment (or payments) contingent upon some observable measure of performance (e.g., the target firm's post-acquisition sales, net income, ROA). Similarly, contingent consideration arrangements are used requiring an additional payment conditional on the resolution of some uncertain future event (e.g., obtaining regulatory approval to market a new drug). Throughout the paper, we refer to both types of contingent payment arrangements as "earnouts."

losses flowing through post-acquisition earnings (FASB 2007). Under the previous standard, no liability recognition was required. Earnouts had no immediate income effect as they were only recognized in the financial statements as increases in goodwill if and when a payment was made. Furthermore, target financial performance was generally monitored indirectly through the audit of the acquirer's consolidated financial statements. As a consequence of the changes in accounting for earnouts under SFAS 141(R), auditors now have a more direct role in monitoring these contracts. Specifically, auditors must now directly verify the target's performance against the criteria specified in the contract as they assess acquirers' fair value estimates for earnout liabilities. Moreover, auditors must verify whether acquiring firms are contractually obligated to make additional payments to target-firm shareholders because of liability recognition.²

Corporate executives and major accounting firms expressed concerns that accounting for earnouts under SFAS 141(R) could make earnings less predictable. A newsletter released by KPMG's Transaction Services group warns that earnouts under the new standard will "create significant risk of postcombination earnings volatility, which may often be difficult to predict and model when providing earnings guidance"(KPMG 2008a). Along these lines, PriceWaterhouseCoopers (2010a) cautions that SFAS 141(R) may "introduce a level of volatility in the buyer's earnings in post acquisition periods that results from the earnout arrangement."³

Managers take real economic actions to meet financial reporting objectives, and place particular

² Our summary of the effect of SFAS 141(R) on auditors' role in providing assurance related to earnout contracts is based on discussions with experienced Big 4 audit personnel. Auditors are required to perform these procedures under SFAS 141(R) to the extent earnouts could have a material effect on the financial statements. Earnouts having an immaterial effect on the financial statements may not be subject to auditor assurance.

³ It is possible that under certain circumstances earnouts will result in less volatile earnings after SFAS 141(R) if the changes in the earnout liability offset the target's post-acquisition earnings. This occurs when changes in the earnout liability closely covary with the target's earnings in each re-measurement period until the earnout liability is settled. We do not test whether earnouts are actually associated with increases or decreases in ex-post earnings volatility under SFAS 141(R). Rather, the focus of this study is on how ex-ante expectations of potential financial reporting costs affect managers' contracting decisions.

importance on reporting predictable earnings (Graham et al. 2005). Recognizing additional liabilities and goodwill under the new standard could also affect acquiring firms' ability to meet other financial reporting objectives (Cadman et al. 2013; Thompson and Schnorbus 2010). The financial statement effects of earnouts under SFAS 141(R) create potential financial reporting costs, which all else equal, we predict will reduce the likelihood of earnouts under the new standard.

The unique features of this setting also allow us to develop and test competing predictions about how the presence of a high-quality auditor will affect the likelihood of earnouts under SFAS 141(R). Despite the financial statement effects of earnouts under the new standard, managers could exploit subjectivity inherent in fair value accounting to achieve their financial reporting objectives. Financial reporting flexibility is constrained when auditors limit managers' opportunistic accounting choices (Becker et al. 1998; Francis et al. 1999). Therefore, earnouts may be even less likely under SFAS 141(R) in the presence of a high-quality auditor if managers expect financial reporting flexibility will be constrained by their auditor.

On the other hand, we may find earnouts are more likely under SFAS 141(R) in the presence of a high-quality auditor if increases in auditor monitoring are expected to provide contracting benefits to acquirers and target-firm shareholders. The auditing process enhances verifiability of accounting numbers, enabling parties to contract more efficiently (Ball 2001). Disputes over earnout payments commonly allege acquirers engage in opportunistic accounting manipulation to avoid making payments to target-firm shareholders. Under SFAS 141(R), contracting parties may recognize these types of disputes are less likely to occur with a high-quality auditor now required to directly verify whether the target achieves the performance benchmark.

Using a sample of M&A transactions completed during the period surrounding the adoption of SFAS 141(R), we find that acquisition contracts are less likely to include earnout provisions under the new standard, all else equal. However, we also find evidence that the presence of a high-quality auditor moderates the effects of financial reporting costs arising from earnouts under SFAS 141(R). These results are consistent with a cost-benefit tradeoff of expected financial reporting costs for the contracting benefits of direct verification by a high-quality auditor under the new standard. Our inferences hold after controlling for the potential effects of changing macro-economic conditions, and transaction- and firm-specific characteristics shown to influence the design of earnout contracts. Results are robust to alternative proxies for audit quality and correcting for potential endogeneity using propensity score matched and treatment effects research designs.

To draw stronger inferences about how the design of acquisition contracts differs under SFAS 141(R), we examine changes in the likelihood that parties will use an accounting-based earnout contract. Auditors provide little (if any) enhanced assurance of meeting non-accounting-based benchmarks (e.g., obtaining FDA approval to market a new drug). We find accounting-based earnouts are more likely in the presence of a high-quality auditor under SFAS 141(R), but high-quality auditors have no effect on the likelihood of non-accounting-based earnouts.⁴ These findings help support the conjecture that direct auditor verification of accounting numbers as a result of SFAS 141(R) leads to expected contracting benefits.

⁴ Whether or not a high-quality auditor actually provides superior ex-post monitoring is not as important as the auditor's perceived reputation. In this setting, the auditor's reputation should influence the contracting parties' ex-ante beliefs about how the auditor will monitor the contract. These beliefs affect how contracting parties form their expectations of financial reporting and contracting costs when negotiating the terms of the acquisition contract.

We find additional evidence that financial reporting costs and auditor monitoring affect other features of earnout contracts. Controlling for the decision to use an earnout, potential future earnout payments are smaller and performance measurement periods are shorter under SFAS 141(R). By limiting the size of earnout payments and the period of time over which performance is measured, acquirers using earnouts under the new standard can limit their exposure to financial reporting costs. However, we find the presence of a high-quality auditor moderates the size effect, consistent with the contracting benefits of increased auditor verification.

By exploiting the unique features of our research setting, we provide initial insights about how auditing and changes in accounting standards interact in financial contracting decisions. Our study documents that expected increases in auditor monitoring following a change in accounting standards can result in a tradeoff of financial reporting costs for contracting benefits.⁵ Specifically, contracting parties can benefit from an increase in expected ex-post auditor verification of accounting numbers incorporated in financial contracts. Our findings contribute more broadly to the literature on the role of auditors in financial contracting. Prior research examining debt contracts finds that auditor verification is associated with the number of accounting-based covenants (Chow 1982) and the cost of debt (Blackwell et. al 1998, Pittman and Fortin 2004). Allee and Yohn (2009) find evidence that auditors reduce frictions between borrowers and lenders, facilitating greater access to debt financing. We add to this literature demonstrating how the effects of auditor monitoring can extend to the features of other financial contracts involving accounting numbers.

⁵ Our results should not be interpreted to suggest that high-quality auditors do not impose additional financial reporting costs in other settings. The stark differences in accounting for earnouts before and after SFAS 141(R) provide a powerful setting to test whether auditing *can* provide contracting benefits following a change in accounting standards. Future research might identify the conditions following a change in accounting standards that result in auditors imposing additional financial reporting costs.

We provide new insights for the literature documenting how managers' financial reporting objectives influence the way transactions are structured to attain desired accounting benefits (Robinson and Shane 1990, Lys and Vincent 1995, Aboody et al. 2000, Weber 2004) and how changes in accounting standards affect financial contracts (Beatty et al. 2002, Frankel et al. 2008). In our setting, we find results consistent with transactions structured to better meet managers' financial reporting objectives, but these results are moderated by the potential contracting benefits that arise from ex-post monitoring by a high-quality auditor. Earnouts represent a contracting mechanism designed to mitigate agency conflicts between targets and acquirers and resolve valuation uncertainty in M&A transactions (Kohers and Ang 2000, Datar et al. 2001, Reuer et al. 2004, Cain et al. 2011). While this literature focuses primarily on target firms' informational characteristics, we demonstrate that acquiring firms' contracting and financial reporting costs are also associated with how the acquisition contract is designed.

Finally, our study has implications for recent research on the role of verification in M&A transactions. Skaife and Wangerin (2013) provide evidence that ex-ante verification of targets' accounting information during due diligence identifies target firm financial reporting problems, leading to an increased likelihood of deal termination, downward price renegotiation, and restatements. De Franco et al. (2011) document that enhanced verification of private target-firm financial statements provided by Big N auditors are associated with higher acquisition premiums. Xie et al. (2010) find that firms with Big N auditors are more likely to become targets in completed acquisitions. Our paper provides the first evidence that expected *ex-post* verification of accounting numbers by high-quality auditors is associated with the design of acquisition contracts following a change in accounting standards where both parties have continuing financial interests.

The remainder of the paper is organized as follows: in Section 2, we explain our predictions, and describe the research design in Section 3. In Section 4, we describe the sample and present descriptive statistics. We report the results of our empirical tests in Section 5. Section 6 concludes the study.

2. Background and Predictions

Why Earnout Contracts are used in M&A Transactions

An earnout is a contract that calls for a future payment (or payments) to target-firm shareholders contingent upon achieving certain performance criteria over a specified period following an M&A transaction. Such a contractual mechanism is beneficial to target-firm shareholders and acquiring firms when adverse selection and/or moral hazard problems create valuation uncertainty about the target firm (Cain et al. 2011). Tying an additional contingent payment to future performance facilitates M&A deals that may not have otherwise been completed when acquirers and targets are unable to agree on a mutually acceptable purchase price (Kohers and Ang 2000). Essentially, earnouts allow target-firm shareholders to receive a greater purchase price (to the extent the specified future performance is achieved), while at the same time protects the acquirer from overpayment.

Along these lines, prior research finds that earnouts are more likely to be employed in acquisitions and call for larger contingent payments when greater information asymmetries exist between target and acquiring firms (Cain et al. 2011; Kohers and Ang 2000, Datar et al. 2001). The typical earnout contract consists of an upfront fixed payment to target-firm shareholders on the closing date of the transaction, as well as additional future contingent payments. Earnout contracts often use accounting-based performance benchmarks, such as a given level of sales or

ROA the target firm must achieve following the acquisition.⁶ Earnouts also frequently call for achievement of non-accounting-based performance criteria (e.g., obtaining FDA approval to market a new drug, continued employment of key executives) and can be based on multiple measures.⁷ Appendix A provides excerpts from of firms' earnout disclosures describing the benchmarks and other features of these contracts.

Financial Reporting Costs of Earnouts under SFAS 141(R)

The FASB significantly changed accounting for earnouts when issuing SFAS 141(R). In Figure 1, we show journal entries highlighting differences in the financial statement effects of earnouts before and after SFAS 141(R). Under the prior standard, there was no recognition in the acquirer's financial statements of expected earnout payments at the time of the acquisition, and earnouts were only recognized as an increase in goodwill if and when they were ultimately paid. Under SFAS 141(R), earnouts affect the financial statements over the entire duration of the contract beginning on the acquisition date, each interim quarterly reporting date, and on the settlement date regardless of whether a payment is made. Effective for fiscal years beginning after December 15, 2008, earnouts must be measured at fair value and recognized as a liability on the acquirer's balance sheet as of the acquisition date. The liability is then re-measured each subsequent reporting period, resulting in gain or loss recognition in the acquirer's income statement. If the acquirer actually makes the earnout payment, any difference between the

⁶ The amount of the earnout payment is typically a fixed percentage of the performance benchmark (e.g., x percent of EBITDA over the n-month period following the acquisition date) or a step function based on achieving various levels of the performance benchmark (e.g., an additional payment of \$w for the first \$x in sales, another payment of \$y for the next \$x in sales over the n-month period following the acquisition date), both capped at some maximum amount (Cain et al. 2011).

⁷ In our sample of earnout deals completed between 2007 and 2010, 85.4 percent of the contracts include accounting-based performance benchmarks and 13.6 percent are based on non-accounting-based performance benchmarks only.

payment and the liability also results in a gain or a loss. If the acquirer makes no payment when the contract expires, the liability is written-off resulting in a gain.

INSERT FIGURE 1 ABOUT HERE

Around the time SFAS 141(R) was issued, corporate executives and other M&A professionals expressed concerns that the new accounting requirements for earnouts could contribute to unpredictable volatility in post-acquisition earnings (KPMG 2008a, Wolf and Fox 2010, PriceWaterhouse-Coopers 2010a). Similar concerns are expressed in acquirers' post-SFAS 141(R) disclosures regarding earnouts, for which we provide several examples in Appendix A. In 2010, Onyx Pharmaceuticals Inc. increased their earnout liability, resulting in a loss of \$92.9 million. They state that “any further changes to these estimates and assumptions could significantly impact the fair values recorded for this liability resulting in significant charges to our Consolidated Statements of Operations.”⁸ In 2009, Endo Pharmaceuticals Holdings Inc. decreased their earnout liability, resulting in a gain of \$128.1 million. They state that “changes in any of our assumptions may result in a further volatility to the estimated fair value of the acquisition-related contingent consideration...and could materially impact our results of operations in future periods.”

The ability to report predictable earnings represents a particularly important financial reporting objective commonly held by managers of public U.S. firms. In a survey of more than 400 executives, Graham et al. (2005, p. 5) report, “predictability of earnings is an over-arching concern among CFOs” and “executives believe that less predictable earnings...

⁸ Onyx Pharmaceuticals also directly attributes their 2010 net loss to changes in the earnout liability by stating in the report “for the year ended December 31, 2010, we reported a net loss of \$84.8 million, which is principally attributed to a \$92.9 million expense associated with the change in the fair value of the non-current contingent consideration liability...”

command a risk premium in the market.” These views are consistent with empirical research suggesting predictable earnings are priced at a premium (DeAngelo et al. 1996, Barth et al. 1999). The uncertain potential financial statement effects of SFAS 141(R) on earnings predictability, therefore, could impose financial reporting costs on acquirers considering using earnouts in acquisition contracts.⁹

The requirement to recognize contingent liabilities under SFAS 141(R) could also result in additional financial reporting costs of earnouts. Particularly, recognition of additional liabilities could move companies closer to, or trigger, debt covenant violations (Thompson and Schnorbus 2010). Recognition of additional liabilities might also increase incremental borrowing costs, restrict access to capital, and adversely impact financial statement ratios used to assess acquirers’ creditworthiness. Any goodwill recorded on the acquisition date due to the earnout liability will remain on the acquirer’s balance sheet, increasing the risk of future goodwill impairments under SFAS 141(R) (Cadman et al. 2013; Thompson and Schnorbus 2010).

Prior research documents that accounting standards have real effects of firm behavior. Related to our study, managers take their financial reporting objectives into consideration when structuring acquisition contracts, and do so even when it is costly to shareholders (Robinson and Shane 1990, Lys and Vincent 1995, Aboody et al. 2000, Weber 2004). As noted in another PriceWaterhouseCoopers (2010b) newsletter discussing concerns about the potential earnings volatility imposed by SFAS 141(R), “The simplest way to limit volatility is to eliminate... earn-

⁹ Acquirers can also avoid gain or loss recognition under SFAS 141(R) by using “equity-classified” earnouts, but must still recognize goodwill corresponding to the fair value of the expected earnout payment on the acquisition date. This accounting treatment can be used under SFAS 141(R) if two conditions are met; (1) the earnout is settled in a fixed number of the acquirer’s shares, and (2) the performance benchmark is based solely on the future performance of the firm. “Equity-classified” earnouts are rare. We search acquirers’ 10-K filings and find only nine transactions where such an earnout is used. Our results are robust to excluding these transactions from the sample.

outs.” Thus, all else equal, we expect acquirers will respond to the potential financial reporting costs of SFAS 141(R) by using fewer earnouts.

The Role of the Auditor

The financial reporting changes for earnouts brought about by SFAS 141(R) had a significant impact on the way earnout contracts affected auditors’ opinions. Under the previous standard, earnouts represented off-balance sheet commitments and received little attention from auditors because of their limited financial statement effects. Liability and gain or loss recognition for earnouts represent new items subject to audit that were not recognized in financial statements prior to SFAS 141(R). Managers have opportunities to exploit the subjectivity inherent in fair value accounting for earnout liabilities under the new standard to meet their financial reporting objectives. Prior literature documents that high-quality auditors limit financial reporting flexibility by constraining managers’ opportunistic accounting choices (Becker et al. 1998, Francis et al. 1999). Therefore, a high-quality auditor could impose additional financial reporting costs on acquirers by limiting the flexibility inherent in managers’ fair value estimates for earnout liabilities. Thus, firms with a high-quality auditor under SFAS 141(R) may be even less likely to use earnouts if acquirers expect that their auditor will limit the flexibility in fair value accounting for earnouts.

On the other hand, the expected increase in auditor monitoring of earnout contracts under SFAS 141(R) could provide contracting benefits to acquirers and target-firm shareholders, making earnouts a more efficient contracting mechanism for firms with a high-quality auditor. Moral hazard conflicts arise between the acquirer and target-firm shareholders in earnout

contracts because acquiring firm managers have the incentive to manipulate the performance benchmark to avoid making a costly additional payment (Datar et al. 2001).¹⁰

Disputes between acquirers and target-firm shareholders over earnout payments often result in costly post-acquisition litigation and commonly allege opportunistic accounting manipulation intended to ensure the target's performance fell short of the benchmark (Wolf and Fox 2010, Liebnick 2011).¹¹ Prior to SFAS 141(R), auditors' opinions on acquirers' financial statements provided indirect assurance related to accounting for the target's performance relative to the earnout benchmark. However, recognizing the potential for these disputes prior to SFAS 141(R), attorneys advocated negotiating contractual provisions giving either party the right to engage an independent auditor in the event of an accounting dispute (American Bar Association 2004; Lamal 2008). This contracting mechanism is especially important to the extent acquirers can avoid auditor scrutiny by manipulating the performance benchmark without materially misstating their financial statements.¹²

Target-firm shareholders and acquirers may recognize that the likelihood of accounting-related disputes can be reduced when a perceived high-quality auditor is already in place and expected to directly monitor the earnout contract under SFAS 141(R). Over the life of the contract, the auditor must now directly verify the performance benchmark itself as they assess their clients' fair value estimate for the earnout liability. At the end of the earnout period, the auditor then makes an independent assessment of whether the performance benchmark has been

¹⁰ For example, suppose a contract calls for a \$50 million earnout payment if the target achieves an ROA benchmark of 10 percent. The acquirer can avoid making the payment by exploiting its financial reporting discretion and reducing the target's ROA to 9.9 percent (or lower). When the target firm maintains control over the financial reporting system after the acquisition, similar incentives arise that encourage opportunistic accounting behavior by target-firm managers in order to meet the performance benchmark.

¹¹ We include an example of such a dispute in the excerpt from the Transcend Services 2009 10-K in Appendix A.

¹² Misstating the target's financial performance may not have a material effect on the consolidated financial statements when the target operates as a subsidiary of the acquiring firm following the acquisition.

met, and whether the client has a contractual obligation to make a payment to target-firm shareholders. Therefore, the effects of direct auditor monitoring under SFAS 141(R) could increase the likelihood of earnouts in the presence of a high-quality auditor.

3. Research Design

Modeling the Decision to use an Earnout Contract

We assume that managers take into account expected contracting costs and benefits when determining whether or not to use an earnout in an acquisition contract. We also assume that managers consider how accounting for earnouts under the new standard will affect their ability to meet desired financial reporting objectives. Therefore, we model the decision to use an earnout contract as a joint function of financial reporting and contracting costs. Equation (1) shown below presents the logistic regression model we use to test our predictions where the dependent variable is *earnout*, coded one if the acquisition contract includes an earnout; zero otherwise.

$$\begin{aligned} Pr(earnout=1) = & b_0 + b_1 post141R + b_2 big4auditor + b_3 post141R*big4auditor \\ & + deal\ and\ target\ characteristics + macro-economic\ conditions \\ & + acquirer\ characteristics + e \end{aligned} \quad (1)$$

The indicator variable *post141R* is coded one for deals completed by acquirers that must be accounted for under the new standard. Specifically, SFAS 141(R) is effective for all acquisitions completed in fiscal years beginning after December 15, 2008. Throughout our analyses, the *post141R* indicator variable captures expected financial reporting costs of earnouts under the new standard. All else equal, we expect the potential financial reporting costs associated with SFAS 141(R) to be associated with fewer earnouts. Thus, we expect the coefficient on *post141R* to be negative.

Prior literature suggests that Big N auditors provide superior monitoring by delivering high-quality audits in order to protect their brand name and reputation (DeAngelo 1981, Francis and Wilson 1988, Francis 2004). In our setting, whether or not Big N auditors actually do provide superior monitoring is not as important as the auditor's perceived reputation for quality. More specifically, the auditor's reputation should influence the contracting parties' ex-ante beliefs about how the auditor will monitor the contract. These beliefs affect how contracting parties form their expectations of financial reporting and contracting costs.

To proxy for the presence of a (perceived) high-quality auditor, we use the indicator variable *big4auditor* which is coded one when the acquiring firm uses a Big 4 audit firm, zero otherwise. The coefficient on the main effect of *big4auditor* picks up the effects of the presence of a Big 4 auditor on the likelihood of earnouts prior to SFAS 141(R). Indirect monitoring provided by a high-quality auditor could increase the likelihood of earnouts prior to SFAS 141(R), but may not be sufficient enough to provide contracting benefits. Therefore, the presence of a high-quality auditor may have a positive effect, or no effect, on the likelihood of earnouts prior to SFAS 141(R). On the other hand, earnouts could be less likely if high-quality auditors reduce valuation uncertainty about the target firm during the due diligence process, or more likely if they uncover more uncertain information. In addition, Louis (2005) documents that acquiring firms with non-Big N auditors make more efficient acquisitions as a result of their auditors' superior client relations and knowledge of local markets. This effect is more pronounced in acquisitions of private targets which other literature shows are more likely to involve earnouts (Kohers and Ang 2000; Datar et al. 2001). For this reason, we might also find clients of Big 4 auditors to be less likely to use earnouts under the prior standard. Because it is

unclear how high-quality auditors affect the likelihood of earnouts prior to SFAS 141(R), we make no signed prediction for the coefficient on *big4auditor*.

To capture the effect of an expected increase in direct monitoring of earnout contracts by a high-quality auditor under SFAS 141(R), we interact *big4auditor* with *post141R*. Because there are competing hypotheses, we make no signed predictions as to whether the presence of a high-quality auditor will increase or decrease the likelihood that acquisition contracts will contain earnout provisions under SFAS 141(R). A negative association between the *post141R*big4auditor* interaction and *earnout* is consistent with the prediction that high-quality auditors will constrain financial reporting flexibility making it more difficult for acquirers to achieve their desired financial reporting objectives. A positive association between the *post141R*big4auditor* interaction and *earnout* throughout our analyses provides evidence consistent with expected contracting benefits of monitoring by a high-quality auditor under SFAS 141(R).

Controls for Deal and Target Characteristics

Throughout our analyses, we control for deal and target characteristics shown in prior literature to affect contracting costs and influence the design of earnout contracts. We control for the relative bargaining power between the acquirer and target using the variable *relative size*, defined as the ratio of the value of the deal reported by SDC to the market value of the acquiring firm at the end of the year prior to the deal. The purchase price negotiated by the parties also reflects the net costs and benefits of the deal. Therefore, we control for the magnitude of the purchase price with the variable *ln(dealvalue)*, defined as the log of the deal value reported by SDC (Datar et al. 2001).

In acquisitions involving targets with greater information asymmetry, earnouts are more likely to occur and the size of the potential future payment increases. We include several variables used in the prior literature capturing greater levels of asymmetric information between the contracting parties. Targets that are either subsidiaries of public firms or privately held have greater information asymmetry and are more likely to be involved in earnout deals (Kohers and Ang 2000, Datar et al. 2001). Therefore, we include the indicator variables *subsidiary* and *private*, coded one when the target is a subsidiary of a public firm and a private firm, respectively. Following Datar et al. (2001), we include the control variables *cross-industry* and *past deal volume*. Information asymmetries are greater between targets and acquirers operating in different industries. In addition, a greater adverse selection problem arises in industries with fewer acquisitions that acquirers can use to identify comparable purchase prices paid in similar deals. We define *cross-industry* as an indicator variable coded one when the target and acquiring firms' 2-digit SIC codes differ, zero otherwise. The variable *past deal volume* is defined as the log of the number of acquisitions in the target's primary 4-digit SIC completed in the year of the transaction.

Related studies also use a variety of industry-level variables to proxy for variation in the target's characteristics. Industry-level data is used because firm-specific financial data is not widely available for private firms and subsidiaries of public firms that become M&A targets. For example, Cain et al. (2011) find targets from industries with greater return volatility and R&D intensity receive larger potential earnout payments. Datar et al. (2001) find targets from industries with greater market-to-book ratios, R&D intensity, and employees are more likely to be involved in earnout deals. We include four industry-level measures used throughout the literature constructed using industry medians corresponding to the year of the transaction. First,

sd_returns is defined as the industry median standard deviation of daily returns. The second measure, *R&D/Sales*, is defined using the industry median ratio of R&D expense to sales. The third measure, *#employees*, is the median number of employees within the target's industry. Fourth, *MTB* is the industry median market-to-book ratio and also controls for variation in target firm growth opportunities.

Controls for Macro-Economic Conditions

Our sample period (2007-2010) coincides with a period of distress and instability in U.S. financial markets. Over this period (the "credit crisis"), significant uncertainty existed about changes in future economic conditions leading to lower liquidity and access to capital for investment. Therefore, we control for macro-economic conditions potentially affecting M&A activity, and more specifically, financial contracting in M&A. Our multivariate analyses include the variables *M&A activity* and *Premium* to capture the possible effects of the credit crisis on the U.S. M&A market. We define *M&A activity* as the log of one plus the number of acquisitions completed in the target's 2-digit SIC industry during the concurrent calendar quarter. The variable *Premium* is the median acquisition premium paid in the target's 2-digit SIC industry during the concurrent calendar quarter, computed as the percentage paid above the target's stock price four weeks prior to the deal announcement date. These variables capture temporal variation in macro-economic conditions potentially affecting the M&A market within the target's industry during our sample period.

We employ the variable *LIBOR* to control for changes in the cost of bank lending and *TEDspread* to capture variation in general credit risk affecting U.S. financial markets throughout the sample period (Blankespoor et al. 2013). *LIBOR* is the three-month London Interbank Offered Rate in effect at the end of month of deal completion for each acquisition. *TEDspread* is

the difference between the three-month LIBOR and the three-month T-Bill rates corresponding to the month of deal completion. During times of the most severe financial crises, the spread between LIBOR and the T-bill rate becomes more pronounced and therefore exhibits significant variation throughout the credit crisis, peaking in October of 2008 (Brunnermeier 2009). The variable *daily ret vol* controls for general economic uncertainty over the sample period and is calculated as the quarterly stock return volatility of the daily CRSP value-weighted index. Finally, we also adjust the standard errors in all of our regressions, clustering by the year of deal completion and by acquiring firm, to correct for potential within-year and firm correlation of residuals due to macro-economic conditions.

Controls for Acquirer Characteristics

We control for acquirer characteristics shown in prior literature to influence firms' decision to employ high-quality auditors (Francis et al. 1999), as these same characteristics are also potentially correlated with firms' financial contracting choices. Research suggests that larger firms tend to choose Big N auditors. Since this implies that our evidence of an auditor effect could be driven by acquiring firm size, we include $\ln(\text{assets})$ in our multivariate analyses, defined as the natural log of one plus the acquiring firm's total assets. Chaney et al. (2004) document that asset turnover is negatively related to Big N auditor selection. Therefore, we include *ATO* as a control variable, calculated as the ratio of sales to average total assets.

Another firm characteristic that has been associated with auditor choice is leverage, as debt contracts create a demand for higher quality audits. Accordingly, DeFond (1992) and Firth and Smith (1992) find a positive association between leverage and selection of high-quality auditors. Contrary to their findings, Francis and Wilson (1988) observe that there is a negative association between leverage and choice of a Big N auditor. One potential explanation for this

result is that the Big N firms may refrain from auditing significantly leveraged clients due to heightened audit risk. We include the variable *LEV* as a control in our analyses, defined as the ratio of debt to assets. Finally, Johnson and Lys (1990) identify return on assets as a variable that may be related to auditor choice, as more profitable firms are more likely to pay the fee premium demanded by a high-quality auditor. Thus, we control for acquirer *ROA* in our analyses defined as the ratio of income before extraordinary items to average total assets. To avoid the potential for the acquisition itself to contaminate these measures, all acquirer characteristics are measured as of the end of the year prior to the deal.

4. Sample and Descriptive Statistics

Sample Selection and Summary Statistics on Earnout Deals

We obtain our sample of acquisitions completed between 2007 and 2010 from the SDC Platinum Mergers & Acquisitions database. This time period allows for a balanced window of about two years just before and just after adoption of SFAS 141(R). Consistent with prior literature, we exclude deals where SDC does not report the value of the consideration exchanged (deal value) and include only completed acquisitions of at least 50 percent of the target firm's shares. Our analyses require target firm industry-level data and firm-specific data for the acquiring firm. There are 3,591 transactions meeting our data requirements, of which 462 (12.87 percent) involve an earnout. Table 1 Panel A reports summary statistics on the frequency of earnout deals over the sample period. The number of earnout transactions has declined from 286 transactions before SFAS 141(R) to 176 transactions after SFAS 141(R). Much of this trend is attributable to the general decline in M&A activity from 2007-2010. However, we observe a statistically significant decrease in the percentage of acquisitions involving earnouts before and after SFAS 141(R), from 13.91 percent to 11.47 percent, respectively.

INSERT TABLE 1 HERE

Of the 462 earnout deals in our sample, 329 involve an acquirer with a Big 4 auditor and 133, a non-Big 4 auditor. Overall, there is no significant difference in the percentage of acquisitions involving earnouts across the Big 4 and non-Big 4 auditor subsamples. However, several interesting trends emerge when we partition these subsamples before and after SFAS 141(R). Prior to the issuance of the new standard, acquirers with non-Big 4 auditors completed a significantly greater percentage of earnout deals (20.00 percent) than acquirers with Big 4 auditors (12.37 percent).¹³

After SFAS 141(R), acquirers with Big 4 auditors become *more* likely to use earnouts than acquirers with non-Big 4 auditors. Specifically, 13.26 percent of the deals in the Big 4 auditor subsample include an earnout, compared to only 8.55 percent in the non-Big 4 auditor subsample under the new standard. While the slight increase in the frequency of earnout deals within the Big 4 subsample under SFAS 141(R) is insignificant, the decline within the non-Big 4 subsample is statistically significant. This pattern provides initial evidence consistent with the effects of financial reporting costs contributing to a decline in the use of earnouts by acquirers in the absence of a high-quality auditor. The significant difference in the frequency of earnouts across the Big 4 and non-Big 4 subsamples after SFAS 141(R) also provides evidence consistent with a tradeoff of financial reporting costs for the contracting benefits of an expected increase in monitoring by a high-quality auditor.

Summary Statistics Comparing Earnout and Non-Earnout Deals

¹³ As we discuss above, there are several potential reasons for this difference including that acquirers with Big 4 auditors complete fewer acquisitions of privately held target firms. Louis (2005) reports that 14.1 percent of the acquisitions completed by acquirers with Big 4 auditors involve a private target firm. However, 28.3 percent of the acquisitions completed by acquirers with non-Big 4 auditors involve a private target firm.

In Table 1 Panel B, we partition the sample using the *earnout* indicator variable, report summary statistics, and test for differences in the characteristics of acquisitions in our sample. The sample of non-earnout deals includes 3,129 transactions and represents the control sample in our main analysis. The summary statistics indicate that earnout deals are smaller (*relative size* and $\ln(\text{dealvalue})$) in terms of both means and medians for earnout deals. However, the summary statistics also give an indication that the earnout transactions in our sample are economically significant. The median of the *relative size* variable is 0.144 meaning that more than half of earnout deals exceed 14 percent of acquirer market value.¹⁴

Earnouts are less likely in deals involving subsidiaries of public firms (*subsidiary*) and in cross-industry acquisitions (*cross-industry*). Earnout deals occur more frequently with private target firms (*private*) and in industries with greater acquisition activity (*past deal volume*). Target industry characteristics also differ significantly across the earnout and non-earnout samples. Specifically, earnouts are more likely with targets operating in industries with higher R&D expenditures (*R&D/Sales*), fewer employees (*#employees*), and higher market-to-book ratios (*MTB*). The results reported in Panel B are largely consistent with descriptive statistics reported in prior studies with the exception of differences in past deal volume and cross-industry acquisitions. We also observe several significant differences among our controls for potential macro-economic factors affecting the M&A market during our sample period with greater concurrent quarterly M&A deal volume (*M&A activity*) and greater median target industry deal premiums (*Premium*) for earnout deals. Finally, Panel B reports significant differences among our controls for acquirer characteristics in acquisitions with earnouts. Specifically, acquiring

¹⁴ The distribution for *relative size* is highly-skewed, therefore differences in means should be interpreted with caution. The main results of our study are robust to excluding this variable from the set of controls in equation (1).

firms employing earnouts are, on average, smaller than acquiring firms not employing earnouts and are less levered.

Pairwise Correlations

Table 2 reports the pairwise Pearson product-moment correlation coefficients for the variables of interest in our study. We find a significant negative correlation between *earnout* and *post141R*, which provides more univariate evidence consistent with the effects of financial reporting costs and a decline in the use of earnouts. Consistent with prior literature, *earnout* is negatively and significantly correlated with $\ln(\text{dealvalue})$ and *relative size* and variables capturing information asymmetries between targets and acquirers (e.g., private firms, target industry median ratio of R&D-to-sales, the median industry market-to-book ratio) are positively and significantly correlated with *earnout*. The *post141R* variable is significantly correlated with many of the deal and target control variables, controls for potential macro-economic factors, and acquirer characteristics highlighting the importance of including these variables in our multivariate tests.¹⁵

INSERT TABLE 2 ABOUT HERE

5. Results

Main Findings

We estimate equation (1) and report the results of our main analysis in Table 3. The first specification of the model is labeled “all targets” and includes all observations in our earnout and control samples. The model has significant explanatory power, comparable with prior literature,

¹⁵ Several of the other control variables exhibit significant correlations with each other, and many of these correlations are relatively large. We compute variance inflation factors for each regression we estimate later in the paper. Analysis of the variance inflation factors indicates little concern that our results are significantly influenced by multicollinearity.

and it correctly predicts 86.86 percent of the outcomes. The majority of the control variables for deal, target, and acquirer characteristics are statistically significant and exhibit signs consistent with prior literature. We also find the controls for variation in macro-economic conditions during our sample period have significant explanatory power. Specifically, *Premium* and *daily ret vol* exhibit negative and significant associations with *earnout*, and the coefficients on *M&A activity* and *TEDspread* are positive and significant. In addition, the results indicate that larger acquirers and acquirers with higher leverage are less likely to use earnouts.

Turning to the variables of interest, we find the coefficient on *post141R* is negative and significant.¹⁶ This result is consistent with acquirers using fewer earnouts to reduce the potential effects of financial reporting costs of earnouts under SFAS 141(R). However, we find that the coefficient on the *post141R*big4auditor* interaction variable is significantly positive. This result provides evidence consistent with contracting benefits arising from expected verification of accounting numbers used in earnout contracts, moderating the financial reporting costs of earnouts under SFAS 141(R).

INSERT TABLE 3 ABOUT HERE

The sign and significance of parameter estimates on interaction terms in non-linear models, such as a logit, may differ from its marginal effect (Ai and Norton 2003, Greene 2010). To better assess the economic significance of interaction terms in nonlinear models, Ai and Norton (2003) and Greene (2010) suggest providing supplemental graphical evidence. Therefore, we estimate and plot both marginal effects and z-statistics using the Ai and Norton (2003) procedure in Figure 2. Specifically, we compute the marginal effect and z-statistic of the

¹⁶ Holding all other variables constant at their respective means, the marginal effect of *post141R* is -6.8 percent and is statistically significant (p-value=0.012).

*post141R*big4auditor* interaction for each observation in the sample, holding all other covariates constant at their respective values. Figure 2 shows that the marginal effects for all interaction terms are positive. All z-statistics are also positive, with nearly all (93.4 percent) reaching statistical significance at conventional levels. The average marginal effect of *post141R*big4auditor* is 12.8 percent, which, relative to the unconditional probability of an earnout (12.9 percent), suggests that the presence of a high-quality auditor nearly doubles the likelihood of using an earnout under the new standard, all else equal.¹⁷

INSERT FIGURE 2 ABOUT HERE

While we make no signed prediction for the main effect of the *big4auditor* variable, the negative and significant coefficient reported under the “all targets” specification is consistent with the univariate statistics reported in Table 1 Panel A showing firms with Big 4 auditors use fewer earnouts prior to SFAS 141(R). We conjecture one possible reason for this difference is due to Big 4 audit clients acquiring relatively fewer private target firms and report some evidence supporting this conjecture under the columns labeled “excluding private targets.” When we drop acquisitions of private targets from the sample, the *big4auditor* main effect becomes insignificant, showing audit quality has no effect on earnout contracts prior to SFAS 141(R). More importantly, the signs and significance of *post141R* and *post141R*big4auditor* continue to hold, providing additional evidence of a trade-off of financial reporting costs for contracting benefits of direct auditor monitoring under SFAS 141(R).

Robustness Tests

¹⁷ We plot the marginal effects and z-statistics for the *post141R*big4auditor* interactions included in subsequent tests and find a similar pattern. Specifically, the *post141R*big4auditor* marginal effects and z-statistics are positive for all observations in subsequent tests. For brevity, we elect to report graphical evidence for the “all targets” specification shown in Table 3. Marginal effects plots for our subsequent tests are available from the authors upon request.

We conduct several robustness tests to help rule out the potential alternative explanation that our results are driven by firm characteristics that are correlated with the acquirer's decision to select a Big 4 auditor as well as the decision to use an earnout. Our robustness tests begin by estimating a first-stage selection model where the dependent variable is the *big4auditor* indicator. Following prior literature, the firm characteristics in the selection model include *ln(assets)*, *ATO*, *LEV*, and *ROA* (e.g. Chaney et al. 2004; Lawrence et al. 2011).¹⁸ Results reported in Table 4 Panel A show the model has significant explanatory power, correctly predicting 93.60 percent of the outcomes. All parameter estimates are statistically significant.

In our first robustness test, we replace *big4auditor* with the predicted probability from the first-stage selection equation and estimate a second-stage treatment effects regression where the dependent variable is *earnout*. The inferences from our main analysis remain unchanged. The coefficient on *postI4IR* remains significantly negative and the *postI4IR*big4auditor* coefficient remains significantly positive. By estimating a treatment effects regression, we control for potential selection bias that arises from unobservable firm characteristics (Li and Prabhala 2007). The coefficient on the hazard ratio included in the second-stage model is indistinguishable from zero, suggesting any potential selection bias affecting the model is insignificant.¹⁹

INSERT TABLE 4 ABOUT HERE

¹⁸ The auditor selection models used by Chaney et al. (2004) and Lawrence et al. (2011) also include the current ratio. When including the current ratio in our first-stage selection model, the variable is insignificant (z -statistic = 1.13) and reduces the sample by 1,199 observations due to missing Compustat data. Our results are robust to including the current ratio in the first-stage selection model, however we elect to exclude it in our tabulated robustness tests to ensure our results hold across the entire sample.

¹⁹ Lennox et al. (2012) point out that the results of such selection models can be sensitive to the choice of exclusion restrictions. They recommend that researchers conduct sensitivity tests to ensure that the exclusion restriction choice produces reliable inferences. We have no *a priori* prediction as to which variables can be excluded from the second-stage model. Therefore, we re-estimate the treatment effects regression excluding each of the four variables included in the selection equation. Results are robust across each of these alternative specifications.

Our second set of robustness tests uses propensity-score matching to identify a control sample that is identical along the observable firm characteristics included in the selection equation, but differs with respect to *big4auditor*. In doing so, we are able to distinguish the effect of the presence of a high-quality auditor from the acquiring firm's observable characteristics which might also be correlated with the likelihood of using an earnout. We also overcome potential limitations of our treatment effects tests as propensity-score matching is not sensitive to exclusion restrictions, nonlinearities, and does not rely on a specific functional form.

Following Lawrence et al. (2011), we match each treatment firm (*big4auditor*=1) to a control firm (*big4auditor*=0) without replacement using a caliper of 0.03. That is, we find the control firm with the closest predicted probability from the first-stage selection equation, allowing a maximum difference of 3 percent. As reported in Table 4 Panel B, this procedure yields a propensity-score matched sample of 396 observations. We then re-estimate equation (1) and find that the positive and significant coefficient on *post141R*big4auditor* continues to hold. However, we interpret this result with caution as differences in mean *ln(assets)*, *ATO*, and *LEV* are statistically significant across the treatment and control samples. This suggests the propensity-score matching procedure based on the first-stage selection equation identifies a control sample that still differs significantly along several observable dimensions.

Therefore, we re-estimate an alternative specification of the selection equation using ranked values of *ln(assets)* and *ROA*. This alternative selection model specification continues to exhibit significant explanatory power, correctly predicting 92.93 percent of the outcomes, and produces a matched sample of 384 observations. More importantly, the differences in means between the treatment and control samples are statistically insignificant, suggesting it is capable

of providing more reliable inferences. When re-estimating equation (1), we again continue to find a positive and significant coefficient on *post141R*big4auditor*.²⁰

Lastly, another alternative explanation for our results is that the *big4auditor* variable is simply picking up differences in sensitivity to the financial reporting costs of SFAS 141(R). Therefore, we expand equation (1) to include controls for cross-sectional variation in the potential financial reporting costs of using earnouts under the new standard and interact each variable with *post141R*. To capture sensitivity to earnings predictability, we define an indicator variable equal to one for firms in the bottom quintile of EPS volatility over the three-year period prior to the deal. We use the ratio of total debt to total assets to capture sensitivity to the financial reporting costs of recognizing additional liabilities and goodwill to total assets to capture the increased risk of goodwill impairment. The results of these tests are untabulated for brevity.²¹ Consistent with financial reporting costs reducing the likelihood of earnouts under SFAS 141(R), we find that the interactions controlling for sensitivity to the financial reporting costs of earnings predictability and increased liabilities are negative and statistically significant (z-statistics= -4.98 and -1.69, respectively). We find no evidence that greater sensitivity to the risk of goodwill impairment affects the likelihood of using earnouts under the new standard (z-stat=0.91). Most importantly, the positive and significant interaction term *post141R*big4auditor* continues to hold after controlling explicitly for firm characteristics capturing cross-sectional differences in the sensitivity to financial reporting costs of SFAS 141(R). Overall, the results of our robustness

²⁰ The coefficient on *post141R* variable loses statistical significance in the propensity-score matched samples. It may be that this subsample of firms, that is similar along many observable dimensions, lacks significant variation in sensitivity to the financial reporting costs associated with earnouts under SFAS 141(R). The loss of statistical significance could also be attributed to a significant decrease in the sample size (n=3,591 versus n=396).

²¹ The results of these untabulated tests are available from the authors upon request.

tests provide additional evidence consistent with contracting benefits arising from an expected increase in direct monitoring of earnout contracts by a high-quality auditor under SFAS 141(R).

Industry Specialization as an Alternative Proxy for Audit Quality

Another potential alternative explanation for our finding that firms with Big 4 auditors are more likely to use earnouts under the new standard could be, at least in part, attributable to the “deep pockets” hypothesis. Auditors now have potential legal liability to target-firm shareholders under SFAS 141(R) if they fail to identify whether an acquirer is contractually obligated to make a contingent earnout payment. Big 4 auditors’ deep pockets represent a potential source from which target-firm shareholders can seek to recover damages in litigation, possibly reducing the risk of earnout contracts.

Therefore, we use auditor industry specialization as an alternative measure of audit quality. Prior research provides evidence suggesting that auditors deliver higher quality audits when they possess superior knowledge and expertise in their clients’ industries (Balsam et al. 2003; Dunn and Mayhew 2004; Reichelt and Wang 2010). We add the variable *specialist* to equation (1), coded one if an auditor is the number one auditor in the target firm’s industry in terms of aggregated audit fees in the acquisition year and zero otherwise (Francis et al. 2005; Fung et al. 2012). As reported in Table 5 under the columns labeled “*big4auditor* and *specialist*” we find that the *post141R*specialist* interaction is positive and significant.²² We also continue to find that our main results hold, providing evidence consistent with contracting benefits of expected monitoring by a high-quality auditor. Moreover, the coefficient on *post141R* also

²² Similar to the *post141R*big4auditor* interaction the marginal effects for the *post141R*specialist* interaction are positive for all observations in both specifications of the model.

remains negative and significant. The results of this test suggest acquirers are less likely to use earnouts under the new standard in the absence of both a Big 4 and industry-specialist auditor.

To provide further evidence that monitoring by a high-quality auditor is associated with enhanced contracting benefits under SFAS 141(R), we re-estimate the model within the Big 4 auditor subsample (n=2,591). In doing so, we hold constant variation in auditors' deep pockets along with other characteristics common to Big 4 auditor clients. The coefficient on *post141R* is insignificant, consistent with our univariate summary statistics (reported in Table 1 Panel A) showing no change in the percentage of firms using earnouts within the Big 4 auditor subsample. The coefficient on the *post141R*specialist* interaction continues to be positive and significantly related to the likelihood that the acquisition contract calls for an earnout. These results provide evidence that the deep pockets hypothesis alone cannot explain our main findings.

INSERT TABLE 5 ABOUT HERE

Additional Analysis of Accounting-Based Earnout Benchmarks

To draw stronger inferences about how the design of earnout contracts differ under SFAS 141(R), we examine how the presence of a high-quality auditor is associated with the likelihood that parties will use contracts that include accounting-based verses non-accounting-based performance benchmarks. Auditors provide little (if any) enhanced verification of non-accounting-based performance benchmarks, such as obtaining FDA approval, continued employment of key personnel, or stock price performance. On the other hand, ex-post verification of accounting-based performance measures is an important factor reducing the moral hazard conflicts that arise when parties can manage the performance benchmark opportunistically. If the contract is based on accounting numbers, the auditor's role in verifying the accounting-based measures is increasingly important. Therefore, this additional analysis provides more direct

evidence on the role of verification by high-quality auditors in contracting parties' decisions involving earnouts.

We re-estimate equation (1) using the indicator variables *acc_earnout* and *na_earnout* as the dependent variables. The variable *acc_earnout* is coded one if an earnout payment must be made upon achieving an accounting-based performance benchmark and *na_earnout* is coded one if the earnout is based only on non-accounting-based performance; zero otherwise. Information on the earnout contract is hand-collected from acquirers' 10-K disclosures, restricting the analysis to 164 earnout contracts where the nature of the benchmark is disclosed.

Results reported in Table 6 provide additional evidence consistent with our predictions. In the analysis of accounting-based earnout contracts reported in the first set of columns, the coefficient for *post141R* continues to be negative and significant while *post141R*big4auditor* is positive and significant. In contrast, we find no evidence that the presence of a high-quality auditor affects the likelihood of non-accounting based earnout contracts where there are no contracting benefits from auditor verification. Taken together, these results provide further evidence consistent with the contracting benefits of an expected increase in direct verification of accounting numbers included in earnout contracts by a high-quality auditor under the new standard.

INSERT TABLE 6 ABOUT HERE

Differences in Other Features of Earnout Contracts after SFAS 141(R)

Finally, we examine whether and how financial reporting costs and auditing extend to other features of earnout contracts under the new standard. Specifically, we investigate how (1) the size of maximum payments, and (2) the length of the performance measurement periods specified in earnout contracts, differ before and after SFAS 141(R). Acquirers can reduce

financial reporting costs by reducing the size of the maximum earnout payment and/or use a shorter period over which performance is measured. By reducing the size of the maximum payment, gain or loss recognition due to periodic re-measurement of the liability is constrained within a tighter range. In addition, the difference between the actual payment and the earnout liability will be lower at the end of the earnout period. All else equal, smaller earnouts contribute to lower goodwill, earnout liabilities, and potential earnings volatility relative to larger earnouts under SFAS 141(R). As re-measurement of the earnout liability is required in each subsequent reporting period under SFAS 141(R), the potential earnings volatility associated with earnouts also decreases when the earnout period is shorter. By using these features of earnout contracts, we gain further insights into how financial reporting costs and auditing interact to influence the design of the contract.

We hand collect data from acquirers' 10-K filings on maximum earnout payment amounts and the length of the performance measurement period. In cases where no maximum payment is disclosed, we rely on the value reported by SDC in the 'earnout value' field. After removing transactions with missing data, there are 389 observations remaining for our tests of the maximum earnout payment and 139 observations for the length of the performance measurement period. To control for the potential endogeneity in the design of the contract, we estimate Heckman selection models where the first stage-selection equation is the earnout prediction model reported in Table 3. We define *earnout_size* as the natural log of one plus the maximum earnout payment and *earnout_years* as the earnout number of years over which the target can meet the earnout benchmark(s) before it expires.

Results are reported in Table 7. After controlling for the substantial heterogeneity in the size of the potential earnout payments documented in prior studies and the initial probability of

employing an earnout, we find a negative and significant coefficient on *post141R*, which indicates earnouts are significantly smaller under the new financial reporting regime. This result is consistent with the conjecture that potential financial reporting costs of SFAS 141(R) lead to a reduction in the maximum earnout payment. The coefficient for *post141R*big4auditor* is positive and significant, providing additional evidence consistent with a tradeoff of financial reporting costs for contracting benefits of earnouts under SFAS 141(R).

INSERT TABLE 7 ABOUT HERE

Turning to our analysis of the length of the performance measurement period, we find a negative and significant coefficient on *post141R* consistent with our primary results. This suggests that firms respond to potential financial reporting costs of SFAS 141(R) also by using significantly shorter earnout periods. As re-measurement of the earnout liability is required in each subsequent reporting period under SFAS 141(R), the potential earnings volatility associated with earnouts is reduced when the earnout period is shorter. The coefficient for *post141R*big4auditor* is insignificant, suggesting the contracting benefits associated with high-quality auditor monitoring have no effect on the length of the performance measurement period under the new standard.

6. Conclusion

Accounting for earnouts under SFAS 141(R) provides a unique and powerful setting to examine how auditing and changes in accounting standards interact in financial contracting decisions. Prior research demonstrates that a change in accounting standards increases financial reporting costs and affects the way firms design financial contracts. Consistent with changes in accounting standards increasing expected financial reporting costs, we find that firms significantly reduce the frequency, size, and length of earnouts in M&A transactions completed

under SFAS 141(R), all else equal. However, we find evidence suggesting that an expected increase in monitoring by a high-quality auditor provides expected contracting benefits, moderating the financial reporting costs of earnouts under SFAS 141(R). Our inferences hold after controlling for characteristics shown to influence the design of earnout contracts and are robust alternative proxies for audit quality as well as correcting for potential endogeneity using both propensity score matched and treatment effects research designs.

We make several contributions to the literature. Prior research on earnout contracts focuses on the informational characteristics of target firms, whereas our paper is the first to demonstrate how acquiring firm financial reporting incentives and audit quality are associated with these decisions. Our study also sheds light on how ex-post auditor verification affects financial contracts where contracting parties have continuing financial interests. Most importantly, our study is the first to provide evidence that changes in accounting standards leading to expected increases in auditor monitoring and verification can moderate the effects of financial reporting costs. The evidence we document provides new insights for the literature on how accounting standards affect real decisions. While we find evidence that firms structure financial contracts in predictable ways to reduce the financial reporting costs of SFAS 141(R), this is limited to firms without the potential tradeoff of contracting benefits arising from an expected increase in ex-post monitoring by a high-quality auditor. Future research can extend our work and explore how other dimensions of firms' monitoring environments (e.g., board characteristics, analyst coverage, and institutional investors) affect contracting decisions following a change in accounting standards.

APPENDIX A

Examples from Earnout Disclosures

Onyx Pharmaceuticals, Inc. (2010 10-K)

For the year ended December 31, 2010, we reported a net loss of \$84.8 million, which is principally attributed to a \$92.9 million expense associated with the change in the fair value of the non-current contingent consideration liability for amounts payable to former Proteolix stockholders upon the achievement of specified regulatory approvals within pre-specified timeframes for carfilzomib.

As a result of the acquisition of Proteolix in November 2009 under the terms of an Agreement and Plan of Merger, or the Merger Agreement, which was entered into in October 2009, we made a payment of \$40.0 million in April 2010 and may be required to pay up to an additional \$535.0 million payable in up to four earn-out payments upon the achievement of certain regulatory approvals for carfilzomib in the U.S. and Europe within pre-specified timeframes. **We recorded a non-current liability for the contingent consideration related to the four remaining earn-out payments with a fair value of \$253.5 million at December 31, 2010** based upon a discounted cash flow model that uses significant estimates and assumptions, including the probability of technical and regulatory success (PTRS) of the product candidate, carfilzomib. **Contingent consideration expense is due to the change in the fair value of the recognized amount of the non-current liability for contingent consideration.** For the year ended December 31, 2010, the increase in the fair value of the non-current liability primarily resulted from a \$74.6 million increase due to a change in the PTRS in the second quarter of 2010, partially offset by a benefit recorded as a result of the Amendment. In June 2010, positive data was presented for the 006 carfilzomib trial, a Phase 1b multicenter dose escalation study of carfilzomib plus lenalidomide and low-dose dexamethasone in relapsed and refractory multiple myeloma patients. In July 2010, positive data was also presented for the 003-A1 carfilzomib trial, an open label, single-arm Phase 2b study of single-agent carfilzomib in relapsed and refractory multiple myeloma patients. The data from the 006 and 003-A1 trials positively impacted the PTRS. The remaining increase in the fair value of the non-current liability for contingent consideration resulted from an \$18.4 million increase due to the passage of time. **Any further changes to these estimates and assumptions could significantly impact the fair values recorded for this liability resulting in significant charges to our Consolidated Statements of Operations.**

...Moreover, we may, at our discretion, make any of the remaining earn-out payments in the form of cash, shares of Onyx common stock or a combination thereof. **If we elect to issue shares of our common stock in lieu of making an earn-out payment in cash, this would have a dilutive effect on our common stock and could cause the trading price of our common stock to decline...It is, therefore, difficult for us to accurately forecast profits or losses. (Emphasis added)**

Endo Pharmaceuticals Holdings, Inc. (2009 10-K)

The Indevus Shares were purchased at a price of \$4.50 per Indevus Share, net to the seller in cash, plus contractual rights to receive up to an additional \$3.00 per Indevus Share in contingent cash consideration payments (referred to as the Offer Price), pursuant to the terms of the Agreement and Plan of Merger, dated as of January 5, 2009. Accordingly, the Company paid approximately \$368 million in aggregate initial cash consideration for the Indevus Shares and entered into the Aveed™ Contingent Cash Consideration Agreement and the Octreotide Contingent Cash Consideration Agreement (each as defined in the Merger Agreement), providing for the payment of up to an additional \$3.00 per Indevus Share in contingent cash consideration payments, in accordance with the terms of the Offer. The total cost to acquire all outstanding Indevus Shares pursuant to the Offer and the Merger could be up to an additional approximately \$267 million, if Endo is obligated to pay the maximum amounts under the Aveed™ Contingent Cash Consideration Agreement and the Octreotide Contingent Cash Consideration Agreement. The fair value of those potential obligations is \$58.5 million at December 31, 2009.

...

The range of the undiscounted amounts the Company could pay under the Aveed™ Contingent Cash Consideration Agreement is between \$0 and approximately \$175 million. The fair value of the contractual obligation to pay the Aveed™ contingent consideration recognized on the Acquisition Date was \$133.1 million. We determined the fair value of the obligation to pay the Aveed™ contingent consideration based on a probability-weighted income approach. This fair value measurement is based on significant inputs not observable in the market

and thus represents a Level 3 measurement within the fair value hierarchy. Under the Aveed™ Contingent Cash Consideration Agreement, there are three scenarios that could potentially lead to amounts being paid to the former stockholders of Indevus. These scenarios are (1) obtaining an Aveed™ With Label approval, (2) obtaining an Aveed™ Without Label approval and (3) achieving the \$125.0 million sales milestone on or prior to the fifth anniversary of the date of the first commercial sale of Aveed™ should the Aveed™ Without Label approval be obtained. The fourth scenario is Aveed™ not receiving approval within three years of the closing of the Offer, which would result in no payment to the former stockholders of Indevus. Each scenario was assigned a probability based on the current regulatory status of Aveed™. The resultant probability-weighted cash flows were then discounted using a discount rate of U.S. Prime plus 300 basis points, which the Company believes is appropriate and is representative of a market participant assumption.

...

The range of the undiscounted amounts the Company could pay under the Octreotide Contingent Cash Consideration Agreement is between \$0 and approximately \$91 million. The fair value of the octreotide contractual obligation to pay the contingent consideration recognized on the Acquisition Date was \$39.8 million. We determined the fair value of the contractual obligation to pay the Octreotide Contingent Consideration Payment based on a probability-weighted income approach. This fair value measurement is based on significant inputs not observable in the market and thus represents a Level 3 measurement within the fair value hierarchy.

As of December 31, 2009, the fair value of the acquisition-related contingent consideration decreased by approximately \$128.1 million from the acquisition date primarily reflecting management's current assessment of the decreased probability that we will be obligated to make contingent consideration payments under the Aveed™ Contingent Cash Consideration Agreement within the specified contractual timeframe, as well as the anticipated timeline for the NDA filing and FDA approval of octreotide. **The decrease in the liability was recorded as a gain** and is included in the Acquisition-related items line item in the accompanying Consolidated Statements of Operations. **Changes in any of our assumptions may result in a further volatility to the estimated fair value of the acquisition-related contingent consideration. Such additional changes to fair value could materially impact our results of operations in future periods. (Emphasis added)**

Transcend Services, Inc. (2009 10-K)

On April 1, 2009, we completed the acquisition of the domestic medical transcription business of Transcription Relief Services, Inc., or TRS, in accordance with the Asset Purchase Agreement entered into on March 26, 2009. We purchased the TRS assets and assumed certain liabilities of TRS to expand the Company's market share, capitalize on the potential for the acquired business to grow and leverage our fixed overhead costs across a larger revenue base. TRS's debt was not assumed. The fixed portion of the purchase price was \$4,500,000. We paid \$4,000,000 in cash at closing. In May 2009, we paid an additional \$500,000 upon the seller's delivery of reviewed financial statements and final working capital as of March 31, 2009 and a working capital adjustment of \$11,000. **A contingent payment, due in 2010, will be based on fourth quarter 2009 revenue and sold backlog at December 31, 2009, subject to an overall cap of \$3,000,000. Based on the projections at closing, the Company initially estimated the contingent payment to be approximately \$353,000** (included in other accrued liabilities on the balance sheet). **As of December 31, 2009, the accrual has been increased to \$1,123,000 based on actual fourth quarter revenues. The difference of \$770,000 was recognized in operating expense in the fourth quarter of 2009, in accordance with Topic 805—Business Combinations.** The inclusion of the original estimated contingent consideration increases the estimated total purchase price to \$4,864,000. The purchase price that has been paid thus far was funded using cash on hand. Under the terms of the TRS asset purchase agreement, the seller had until February 28, 2010 to accept or dispute our calculation of the contingent consideration payment. **On February 26, 2010, we received notice that the seller disputed our calculation and claimed an additional payment of \$1.9 million. We have evaluated this claim and believe that no additional payments are due under the calculations outlined in the asset purchase agreement. (Emphasis added)**

APPENDIX B
Variable Definitions

Dependent variables	
<i>earnout</i>	Coded one if the acquisition contract includes an earnout, zero otherwise.
<i>acc_earnout</i>	Coded one if the acquisition contract includes an earnout where payment is contingent upon achievement of an accounting-based measure, zero otherwise.
<i>na_earnout</i>	Coded one if the acquisition contract includes an earnout where payment is based solely on non-financial performance measures, zero otherwise.
<i>earnout_size</i>	The natural log of one plus the maximum earnout payment.
<i>earnout_years</i>	Length of time in years over which achievement of the benchmark is measured.
Test variables	
<i>post141R</i>	Coded one for deals completed by acquirers that must be accounted for under the new standard (e.g., acquisitions completed in fiscal years beginning after December 15, 2008).
<i>big4auditor</i>	Coded one when the acquiring firm uses a Big 4 audit firm, zero otherwise.
Controls for deal and target characteristics	
<i>relative size</i>	Ratio of the value of the deal reported by SDC to the market value of the acquiring firm at the end of the year prior to the deal.
<i>ln(dealvalue)</i>	Log of the deal value reported by SDC.
<i>subsidiary</i>	Coded one when the target is a subsidiary of a public firm.
<i>private</i>	Coded one when the target is a private firm.
<i>cross-industry</i>	Coded one when the target and acquiring firms' 2-digit SIC codes differ, zero otherwise.
<i>past deal volume</i>	Log of the number of acquisitions in the target's primary 4-digit SIC completed in the year of the transaction.
<i>sd_returns</i>	Industry median standard deviation of daily returns for all CRSP firms over the one year period prior to the completion of the deal.
<i>R&D/Sales</i>	Industry median ratio of R&D expense to sales.
<i>#employees</i>	Median number of employees within the target's industry.
<i>MTB</i>	Industry median market-to-book ratio.
Control variables for macro-economic conditions	
<i>M&A activity</i>	Log of one plus the number of acquisitions completed in the target's 2-digit SIC industry during the concurrent calendar quarter.
<i>Premium</i>	Median acquisition premium paid in the target's 2-digit SIC industry during the concurrent calendar quarter computed as the ratio of the price paid per share to the target's stock price four weeks prior to the acquisition, minus one.
<i>LIBOR</i>	Three-month London Interbank Offered Rate in effect at the end of month of deal completion for each acquisition.
<i>TEDspread</i>	Difference between the three-month LIBOR and the three-month T-Bill rates corresponding to the month of deal completion.
<i>daily ret vol</i>	Quarterly volatility of the daily CRSP value-weighted index.
Controls for acquirer characteristics	
<i>ln(assets)</i>	Natural log of one plus total assets.
<i>ATO</i>	The ratio of sales to average total assets.
<i>LEV</i>	The ratio of debt to assets.
<i>ROA</i>	The ratio of income before extraordinary items to average total assets.

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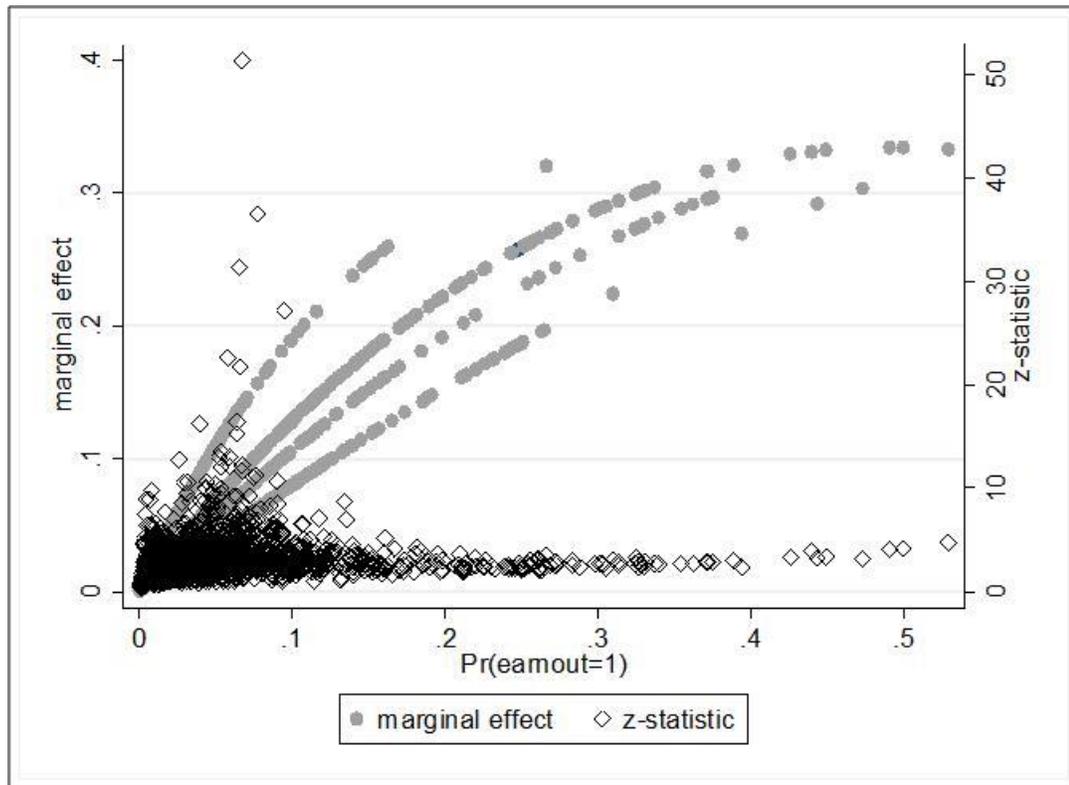
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FIGURE 1

Accounting for Earnout Contracts Before and After SFAS 141(R)

	Acquisition Date	Quarterly Re-Measurements	Settlement Date of Earnout
Pre-SFAS 141(R)	<i>No Recognition of Contingent Consideration</i>	<i>Probability of Payout Increases</i>	<i>Payout</i>
	No Entry	No Entry	Dr.) Goodwill Cr.) Cash/Stock
		<i>Probability of Payout Decreases</i>	<i>No Payout</i>
		No Entry	No Entry
Post-SFAS 141(R)	<i>Recognition of Contingent Consideration at Fair Value</i>	<i>Probability of Payout Increases</i>	<i>Payout</i>
	Dr.) Goodwill Cr.) Liability	Dr.) Loss Cr.) Liability	Dr.) Loss Dr.) Liability Cr.) Cash/Stock Cr.) Gain
		<i>Probability of Payout Decreases</i>	<i>No Payout</i>
		Dr.) Liability Cr.) Gain	Dr.) Liability Cr.) Gain

FIGURE 2
Distribution of Marginal Effects for *post141R*big4auditor*



Notes: We use the Ai and Norton (2003) procedure to compute marginal effects and z-statistics for each observation ($n=3,591$), holding all other covariates constant at their respective values. The marginal effect of the *post141R*big4auditor* interaction term is plotted on the left-vertical axis, and z-statistics are plotted on the right-vertical axis. The horizontal axis plots the predicted probability of *earnout=1*.

TABLE 1
Summary Statistics on Earnout Deals

Panel A: Frequency of earnout deals

	<u>Overall</u>	<u>Big 4 Auditor</u>	<u>Non-Big 4 Auditor</u>
Number of acquisitions	3,591	2,591	1,000
Before SFAS 141(R)	2,056	1,641	415
After SFAS 141(R)	1,535	950	585
Number of acquisitions involving earnouts	462	329	133
Before SFAS 141(R)	286	203	83
After SFAS 141(R)	176	126	50
Percent of acquisitions involving earnouts	12.87%	12.70%	13.30%
Before SFAS 141(R)	13.91%	12.37%	20.00%
After SFAS 141(R)	11.47%	13.26%	8.55%
Increase (decrease) after SFAS 141(R)	(2.44%)	0.89%	(11.45%)

Panel B: Summary statistics on earnout and non-earnout deals

	Earnout Deals (n=462)			Non-Earnout Deals (n=3,129)		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
<i>ln(dealvalue)</i>	3.370	3.258	1.478	3.655	3.597	2.021
<i>relative size</i>	0.944	0.144	2.824	3.601	0.193	12.824
<i>private</i>	0.788	1.000	0.409	0.504	1.000	0.500
<i>subsidiary</i>	0.195	0.000	0.396	0.339	0.000	0.473
<i>past deal volume</i>	5.887	5.793	1.150	5.566	5.545	1.117
<i>cross-industry</i>	0.379	0.000	0.486	0.431	0.000	0.495
<i>MTB</i>	1.677	1.696	0.510	1.602	1.542	0.521
<i>R&D/Sales</i>	0.098	0.106	0.076	0.062	0.025	0.072
<i>#employees</i>	0.895	0.550	0.984	1.224	0.550	1.782
<i>sd_ret</i>	0.035	0.029	0.011	0.035	0.029	0.013
<i>M&A activity</i>	4.550	4.500	1.111	4.231	4.220	1.083
<i>Premium</i>	0.340	0.316	0.333	0.312	0.278	0.349
<i>LIBOR</i>	2.816	3.000	1.916	2.660	2.860	1.956
<i>TEDspread</i>	1.111	1.000	0.887	1.083	0.740	0.936
<i>daily ret vol</i>	0.015	0.012	0.009	0.015	0.012	0.009
<i>ln(assets)</i>	6.584	7.187	1.662	6.866	7.187	1.663
<i>ATO</i>	0.993	0.920	0.664	0.941	0.920	0.635
<i>LEV</i>	0.160	0.068	0.164	0.174	0.195	0.163
<i>ROA</i>	0.033	0.032	0.065	0.032	0.032	0.054

Notes: This table presents summary statistics on a sample of 3,591 M&A transactions completed during the period from 2007-2010. See Appendix B for variable descriptions. Differences in means (medians) assessed using a t-test (Wilcoxon rank sum test). **Bold** indicates differences are statistically significant at the 0.10 level or better.

TABLE 2
Pairwise Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) <i>earnout</i>	-										
(2) <i>post141R</i>	-0.030	-									
(3) <i>big4auditor</i>	-0.005	-0.144	-								
(4) <i>ln(dealvalue)</i>	-0.049	-0.116	0.141	-							
(5) <i>relative size</i>	-0.074	-0.150	0.135	0.472	-						
(6) <i>private</i>	0.184	-0.041	0.015	-0.291	-0.204	-					
(7) <i>subsidiary</i>	-0.095	0.057	-0.015	0.044	0.003	-0.745	-				
(8) <i>past deal volume</i>	0.096	-0.152	0.078	-0.021	-0.041	0.135	-0.158	-			
(9) <i>cross-industry</i>	-0.038	0.048	-0.009	-0.067	-0.032	0.069	0.001	-0.110	-		
(10) <i>MTB</i>	0.048	0.209	0.135	0.020	0.013	0.034	-0.031	0.213	-0.017	-	
(11) <i>R&D/Sales</i>	0.162	-0.024	0.040	-0.021	-0.039	0.079	-0.115	0.588	-0.069	0.353	-
(12) <i>#employees</i>	-0.065	0.022	0.018	0.016	0.029	-0.032	0.102	-0.492	0.110	-0.061	-0.357
(13) <i>sd_ret</i>	-0.003	0.831	-0.246	-0.169	-0.164	-0.022	0.067	-0.084	0.038	0.176	0.138
(14) <i>M&A activity</i>	0.098	-0.147	0.077	-0.022	-0.045	0.137	-0.160	0.985	-0.109	0.207	0.583
(15) <i>Premium</i>	0.027	0.145	-0.017	-0.033	-0.023	0.000	-0.069	0.320	-0.073	0.171	0.320
(16) <i>LIBOR</i>	0.027	-0.877	0.211	0.138	0.171	0.021	-0.048	0.158	-0.040	0.039	0.027
(17) <i>TEDspread</i>	0.010	-0.485	-0.048	-0.001	0.072	-0.002	0.007	0.007	-0.050	-0.377	-0.003
(18) <i>daily ret vol</i>	-0.008	-0.184	-0.123	-0.055	0.024	-0.015	0.019	-0.038	-0.024	-0.370	-0.006
(19) <i>ln(assets)</i>	-0.057	-0.221	0.669	0.143	0.109	-0.019	0.000	0.035	-0.011	-0.057	-0.005
(20) <i>ATO</i>	0.027	0.317	-0.660	-0.112	-0.178	0.023	0.032	-0.088	0.012	-0.049	-0.011
(21) <i>LEV</i>	-0.030	0.584	-0.322	-0.024	-0.191	-0.043	0.075	-0.125	0.027	0.090	-0.057
(22) <i>ROA</i>	0.009	-0.074	0.367	0.125	0.040	0.031	-0.031	0.045	0.008	0.112	-0.002

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(12) #employees	-									
(13) sd_ret	-0.096	-								
(14) M&A activity	-0.474	-0.082	-							
(15) Premium	-0.208	0.185	0.329	-						
(16) LIBOR	-0.037	-0.759	0.147	-0.153	-					
(17) TEDspread	0.000	-0.351	-0.027	-0.116	0.410	-				
(18) daily ret vol	-0.011	-0.087	-0.082	-0.087	0.061	0.797	-			
(19) ln(assets)	0.003	-0.234	0.033	-0.021	0.161	0.126	0.030	-		
(20) ATO	0.044	0.349	-0.085	0.052	-0.341	-0.013	0.088	-0.550	-	
(21) LEV	0.053	0.480	-0.119	0.083	-0.568	-0.272	-0.091	-0.299	0.457	-
(22) ROA	0.017	-0.106	0.045	-0.015	0.111	-0.088	-0.114	0.210	-0.131	-0.109

Notes: The table above reports Pearson product-moment correlations. See Appendix B for variable descriptions. **Bold** text indicates significance at the 0.10 level or better.

TABLE 3
Changes in the Likelihood of Earnouts

Dependent variable: <i>earnout</i>	All Targets		Excluding Private Targets	
	Coeff.	z-stat	Coeff.	z-stat
<i>post141R</i>	-0.895**	-2.21	-0.790***	-2.81
<i>big4auditor</i>	-0.355***	-3.07	-0.243	-0.80
<i>post141R*big4auditor</i>	1.146***	7.17	1.368***	3.97
Controls for deal and target characteristics				
<i>ln(dealvalue)</i>	0.106***	3.85	-0.020	-0.46
<i>relative size</i>	-0.058***	-3.20	-0.043**	-1.98
<i>private</i>	2.758***	14.30		
<i>subsidiary</i>	1.829***	6.12	1.724***	5.56
<i>past deal volume</i>	-0.412***	-2.66	-1.017***	-3.04
<i>cross-industry</i>	-0.217	-1.43	-0.318	-1.45
<i>MTB</i>	-0.052	-0.28	0.123	1.03
<i>R&D/Sales</i>	6.385***	3.74	7.479***	3.41
<i>#employees</i>	-0.067	-1.22	-0.117	-1.21
<i>sd_ret</i>	-0.112	-0.01	7.637	1.53
Controls for macro-economic conditions				
<i>M&A activity</i>	0.316**	2.41	0.899***	2.84
<i>Premium</i>	-0.092***	-4.37	-0.562*	-1.87
<i>LIBOR</i>	-0.031	-0.48	0.113**	2.46
<i>TEDspread</i>	0.108***	5.08	-0.059	-0.44
<i>daily ret vol</i>	-12.503***	-3.40	6.263	0.53
Controls for acquirer characteristics				
<i>ln(assets)</i>	-0.153***	-3.70	-0.164***	-4.07
<i>ATO</i>	0.049	0.53	0.029	0.26
<i>LEV</i>	-1.398***	-4.91	-1.669**	-2.33
<i>ROA</i>	-0.172	-0.20	-0.880	-0.40
Intercept	-2.081***	-3.28	-1.613*	-1.67
N		3,591		1,650
N (<i>earnout</i> =1)		462		98
Pseudo R ²		0.118		0.137
% correctly predicted		86.86%		94.00%

Notes: The dependent variable in the logistic regression models estimated above is *earnout*, an indicator variable coded one if the deal includes an earnout, zero otherwise. See Appendix B for variable descriptions. Statistical significance of the parameter estimates are assessed using heteroskedasticity robust standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 4
Robustness Tests

Panel A: Two-step treatment effects regression

Dependent variable:	1 st -stage Selection Model <i>big4auditor</i>		2 nd -stage Model <i>earnout</i>	
	Coeff.	z-stat	Coeff.	z-stat
<i>post141R</i>			-0.088**	-2.47
<i>big4auditor</i>			0.039	0.97
<i>post141R*big4auditor</i>			0.108***	3.76
Controls for acquirer characteristics				
<i>ln(assets)</i>	0.630***	21.62	-0.024***	-4.40
<i>ATO</i>	-0.815***	-16.06	0.032**	2.20
<i>LEV</i>	-1.685***	-7.00	-0.117**	-2.44
<i>ROA</i>	4.931***	10.37	-0.129	-1.12
<i>Hazard ratio from selection equation</i>			-0.026	-0.90
Controls for deal and target characteristics			Included	
Controls for macro-economic conditions			Included	
N		3,591		3,591
Pseudo R ²		0.601		0.112
% correctly predicted		93.60%		86.97%

Panel B: Propensity-score matching

Dependent variable: <i>earnout</i>	Matching on <i>ln(assets)</i> , <i>ATO</i> , <i>LEV</i> , <i>ROA</i>			Matching on Ranked <i>ln(assets)</i> and <i>ROA</i>		
	Difference in Means	Coeff.	z-stat	Difference in Means	Coeff.	z-stat
<i>post141R</i>		-0.231	-0.30		-0.297	-0.31
<i>big4auditor</i>		-0.379*	-1.75		-0.387***	-5.25
<i>post141R*big4auditor</i>		0.749**	2.43		0.518***	6.60
Controls for acquirer characteristics						
<i>ln(assets)</i>	0.583	-0.223	-1.26	0.115	-0.251	-1.57
<i>ATO</i>	0.388	0.058	0.26	0.112	0.092	0.56
<i>LEV</i>	0.032	-1.081	-0.70	-0.001	-1.497	-1.24
<i>ROA</i>	-0.009	-0.283	-0.91	-0.001	1.162	1.04
Controls for deal and target characteristics		Included			Included	
Controls for macro-economic conditions		Included			Included	
Matching model:	N	3,591			3,591	
	Pseudo R ²	0.601			0.625	
	% correctly predicted	93.60%			92.93%	
Earnout model:	N	396			384	
	Pseudo R ²	0.231			0.207	
	% correctly predicted	81.31%			79.17%	

Table 4 (continued)

Notes: Panel A reports the results of a two-step treatment effects regression where the first-stage regression is a Big 4 auditor selection model. In the second stage regression, *big4auditor* is the predicted probability from the first-stage selection equation and the dependent variable is *earnout*. Panel B reports logistic regression results using a propensity-score matched sample where the dependent variable is the *earnout* indicator variable. Each treatment observation (*big4auditor*=1) is matched without replacement to a control observation (*big4auditor*=0) by finding the observation with the closest predicted probability of *big4auditor*=1 within a caliper of 0.03. Differences in means for acquirer characteristics are computed between the treatment and control observations in the propensity-score matched samples and **bold** text indicates mean differences are statistically significant at the 0.10 level or better. See Appendix B for variable descriptions. Statistical significance of the parameter estimates are assessed using heteroskedasticity robust standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 5
Auditor Industry Specialists and Changes in the Likelihood of Earnouts

Dependent variable: <i>earnout</i>	Big 4 Auditor and Specialist		Specialist Within Big 4 Sample	
	Coeff.	z-stat	Coeff.	z-stat
<i>post141R</i>	-0.948**	-2.39	0.175	0.28
<i>big4auditor</i>	-0.335***	-3.49		
<i>post141R*big4auditor</i>	1.116***	6.61		
<i>specialist</i>	-0.147***	-5.27	-0.129***	-3.73
<i>post141R* specialist</i>	0.425***	3.98	0.696***	8.06
Controls for deal and target characteristics				
<i>ln(dealvalue)</i>	0.105***	4.00	0.101***	2.79
<i>relative size</i>	-0.058***	-3.23	-0.052**	-2.12
<i>private</i>	2.758***	14.48	2.837***	10.45
<i>subsidiary</i>	1.820***	6.03	1.953***	5.22
<i>past deal volume</i>	-0.400**	-2.45	-0.600*	-1.84
<i>cross-industry</i>	-0.221	-1.48	-0.272**	-2.50
<i>MTB</i>	-0.051	-0.28	-0.085	-0.26
<i>R&D/Sales</i>	6.366***	3.77	6.363***	3.02
<i>#employees</i>	-0.066	-1.24	-0.085*	-1.80
<i>sd_ret</i>	0.080	0.01	4.794	0.49
Controls for macro-economic conditions				
<i>M&A activity</i>	0.303**	2.10	0.445	1.40
<i>Premium</i>	-0.089***	-4.14	-0.110	-1.34
<i>LIBOR</i>	-0.033	-0.51	0.024	0.17
<i>TEDspread</i>	0.111***	4.02	0.175**	2.18
<i>daily ret vol</i>	-12.930***	-3.28	-15.687**	-2.10
Controls for acquirer characteristics				
<i>ln(assets)</i>	-0.156***	-3.67	-0.162***	-4.67
<i>ATO</i>	0.045	0.51	0.110**	2.38
<i>LEV</i>	-1.356***	-5.52	-0.978*	-1.72
<i>ROA</i>	-0.156	-0.19	-0.178	-0.15
Intercept	-2.057***	-3.26	-2.272***	-3.78
N		3,591		2,591
Pseudo R ²		0.119		0.113

Notes: The dependent variable in the logistic regression models estimated above is *earnout*, an indicator variable coded one if the deal includes an earnout, zero otherwise. The variable *specialist* is coded one if the auditor is the top auditor in the target's industry (2-digit SIC) in terms of aggregated audit fees in a specific fiscal year, and zero otherwise. See Appendix B for variable descriptions. Statistical significance of the parameter estimates are assessed using heteroskedasticity robust standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 6
Accounting-Based and Non-Financial Benchmarks

Dependent variable:	Accounting-based Benchmarks <i>acc_earnout</i>		Only Non-financial Benchmarks <i>na_earnout</i>	
	Coeff.	z-stat	Coeff.	z-stat
	<i>post141R</i>	-1.7494***	-3.71	-0.5184
<i>big4auditor</i>	-1.1208***	-4.42	0.109	0.19
<i>post141R*big4auditor</i>	3.0138***	8.97	1.0464	1.32
Controls for deal and target characteristics				
<i>ln(dealvalue)</i>	0.0297	0.63	0.6598***	3.44
<i>relative size</i>	-0.0556	-1.34	-0.3963***	-3.73
<i>private</i>	2.3337***	4.41	3.2944***	5.82
<i>subsidiary</i>	1.2205	1.59	1.9865**	2.07
<i>past deal volume</i>	-0.0297	-0.05	-0.1694	-0.32
<i>cross-industry</i>	-0.4011***	-2.60	-0.3828	-0.94
<i>MTB</i>	-0.3034	-1.40	0.2968	1.10
<i>R&D/Sales</i>	4.3587***	3.36	13.6487***	10.81
<i>#employees</i>	-0.1197	-0.90	-0.1686	-0.65
<i>sd_ret</i>	19.4501**	2.45	33.8585	0.81
Controls for macro-economic conditions				
<i>M&A activity</i>	0.1255	0.22	-0.3305	-0.43
<i>Premium</i>	-0.0141	-0.09	-0.2532	-0.42
<i>LIBOR</i>	0.3197***	6.67	0.2078***	2.96
<i>TEDspread</i>	-0.2980*	-1.94	-0.1532	-1.27
<i>daily ret vol</i>	6.1812	0.74	41.1923*	1.70
Controls for acquirer characteristics				
<i>ln(assets)</i>	-0.1349	-0.58	-0.1373	-1.10
<i>ATO</i>	0.4843***	2.63	-1.0956***	-2.78
<i>LEV</i>	-2.6581	-1.52	0.2213	0.17
<i>ROA</i>	0.2541	0.11	-6.6473***	-5.18
Intercept	-4.9590**	-2.24	-9.6657***	-3.20
N	3310		3310	
N (<i>acc_earnout/na_earnout</i> =1)	140		24	
Pseudo R ²	0.171		0.322	
% correctly predicted	95.77%		99.31%	

Notes: The dependent variable in the first logistic regression model estimated above is *acc_earnout*, an indicator variable coded one if the earnout is based on achievement of an accounting-based measure, zero otherwise. In the second regression, the dependent variable is *na_earnout*, an indicator variable coded one when the earnout is based only on a non-financial benchmark, zero otherwise. See Appendix B for variable descriptions. Statistical significance of the parameter estimates are assessed using heteroskedasticity robust standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 7
Additional Analysis of Earnout Contract Features

Dependent variable:	Size of Maximum Payment		Length of Earnout Contract	
	<i>earnout_size</i>		<i>earnout_years</i>	
	Coeff.	z-stat	Coeff.	z-stat
<i>post141R</i>	-1.312**	-1.97	-4.627***	-5.15
<i>big4auditor</i>	-0.429	-1.22	-0.391	-0.60
<i>post141R*big4auditor</i>	1.601*	1.94	1.358	1.44
Controls for deal and target characteristics				
<i>ln(dealvalue)</i>	0.771***	13.39	0.263***	3.66
<i>relative size</i>	-0.036**	-2.07	0.035	1.34
<i>private</i>	2.580***	4.32	-5.024***	-2.62
<i>subsidiary</i>	1.599***	3.08	-4.807***	-2.65
<i>past deal volume</i>	-0.627**	-2.45	-2.924***	-3.18
<i>cross-industry</i>	-0.182**	-2.46	0.32	1.51
<i>MTB</i>	-0.179	-1.12	1.499***	2.92
<i>R&D/Sales</i>	10.189***	5.17	2.184	0.32
<i>#employees</i>	-0.094**	-2.42	-0.333	-0.55
<i>sd_ret</i>	9.168	0.66	67.620***	6.17
Controls for macro-economic conditions				
<i>M&A activity</i>	0.417	1.60	2.297***	2.72
<i>Premium</i>	-0.141	-1.19	-0.776	-1.07
<i>LIBOR</i>	-0.092**	-1.96	-0.623***	-3.08
<i>TEDspread</i>	0.259**	2.22	0.160	0.70
<i>daily ret vol</i>	-20.704	-1.47	9.360	0.27
Controls for acquirer characteristics				
<i>ln(assets)</i>	-0.167***	-3.39	-0.164**	-2.06
<i>ATO</i>	-0.077	-0.43	-0.092	-0.73
<i>LEV</i>	-0.977**	-2.51	0.100	0.09
<i>ROA</i>	1.635	0.82	1.054	0.21
<i>Inverse Mills Ratio</i>	2.096***	4.33	-0.114	0.00
Intercept	-2.684***	-3.69	13.508***	3.76
N	389		139	
Wald χ^2	408.86***		66.61***	

Notes: The dependent variables in the regressions estimated above are *earnout_size* and *earnout_years*. *earnout_size* is the natural log of one plus the maximum earnout payment. *earnout_years* is the length of time in years over which achievement of the earnout benchmark is measured. The regression reported above is a Heckman selection model where the first stage-selection equation is the earnout prediction model reported in Table 3. See Appendix B for variable descriptions. Statistical significance of the parameter estimates are assessed using heteroskedasticity robust standard errors, clustered by firm and year. ***, **, and * indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.