

**The Impact of CEO Compensation Incentives on Financial Reporting Choices: Evidence  
from Potential Ghost Revenues Created in Mergers and Acquisitions**

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## **DEDICATION**

This work is dedicated to my wife Olivia Grace Ashby. I could not have completed this degree without your support, love, encouragement, data collection, and motivation. You are my inspiration and the purpose of my work. This work is also dedicated to my new son. I cannot wait to meet you in person, and I hope that the completion of my dissertation helps me to create a wonderful life for you.

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## ABSTRACT

When an acquirer purchases a target and assumes the target's deferred revenue liability, accounting standards codification 805 requires that the acquirer recognize the target's deferred revenue at its estimated fair value as of the acquisition date. If the target's deferred revenue book value exceeds its fair value, the portion of deferred revenue written down will never be recognized as revenue for the acquirer under generally accepted accounting principles (GAAP). In this study, I investigate the impact of chief executive officers' (CEOs') compensation incentives on the fair value measurement of deferred revenue liabilities in acquisitions. If a larger proportion of CEO cash incentive pay is based on performance metrics tied to GAAP revenue, CEOs have incentives to minimize deferred revenue write-downs because these write-downs reduce post-acquisition revenues. I predict and find that CEOs with a larger proportion of cash incentive pay based on performance metrics tied to GAAP revenue write down less deferred revenues. Additionally, I predict and find that CEOs with a larger proportion of cash incentive pay based on non-GAAP metrics that adjust for deferred revenues which would have been recognized as future revenues (i.e., ghost revenues) write down more deferred revenues. These results provide evidence that manager opportunism in fair value measurement following acquisitions extends to deferred revenue liabilities as well as assets.

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## SECTION I. INTRODUCTION

Fair value measurement allows managers to exercise discretion for either informative or opportunistic reasons. When accounting for business combinations, managers appear to adjust the fair values of certain acquired assets in order to increase their compensation (e.g. Shalev et al. 2013). However, there are no studies investigating whether managers exercise discretion over the fair value measurement of deferred revenue liabilities assumed in acquisitions. Accounting Standards Codification (ASC) 805 (previously classified as Statements of Financial Accounting Standards (SFAS) 141R) requires that the acquirer recognize the target's deferred revenue liability at its estimated fair value as of the acquisition date. Because deferred revenue is typically recorded on the balance sheet at historical cost (i.e., the value of the consideration or payment previously received), the book value of a target's deferred revenue often exceeds its fair value, leading to a deferred revenue write-down.<sup>1</sup> Under generally accepted accounting principles (GAAP), the acquirer cannot recognize the portion of the deferred revenue written down as post-acquisition revenue even if the acquirer satisfies the related performance obligations.

In this study, I investigate the impact of chief executive officers' (CEOs') compensation incentives on deferred revenue write-downs. When CEOs' cash incentive pay is based on accounting performance metrics tied to post-acquisition GAAP revenue, CEOs have incentives to minimize deferred revenue write-downs in order to maximize the revenue recognized under GAAP. Therefore, I predict that CEOs of acquirers with a larger proportion of cash incentive pay based on GAAP revenue (i.e., EBITDA, GAAP earnings, GAAP revenue, etc.) will reduce the magnitude of deferred revenue write-downs.

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<sup>1</sup> "Deferred revenue write-down" is the difference between the book value and fair value of a target's deferred revenue liability assumed by the acquirer as of the acquisition completion date.

Separate streams of accounting research examine the usefulness of deferred revenue liabilities and the usefulness of fair value accounting. For example, prior research finds that previous regulations accounting for deferred revenues have decreased the likelihood of managerial opportunistic behavior, but have also reduced the value relevance of earnings and have led to the mismatching of revenues and expenses (Altamuro, Beatty, and Weber 2005; Prakash and Sinha 2013; Srivastava 2014). However, prior research evaluating the usefulness of deferred revenues does not consider how managers' compensation incentives may influence the fair values of deferred revenues in an acquisition.

Fair value measurement of assets and liabilities often requires significant judgment and allows managers the ability to exercise discretion. Prior studies find mixed evidence of manager opportunism in fair value measurement. Some evidence suggests that certain bank assets and liabilities are value relevant consistent with managers recording appropriate fair values (e.g. Barth 1994; Barth, Beaver, and Landsman 1996; Eccher, Ramesh, and Thiagarajan 1996; Nelson 1996). In contrast, some evidence suggests that managers exercise discretion in fair value-based goodwill impairment tests by delaying or reducing the occurrence of goodwill impairments (e.g. Beatty and Weber 2006; Ramanna and Watts 2012; Li and Sloan 2017). Further evidence suggests that when accounting for business combinations, managers exercise discretion over the fair values of acquired assets (Shalev 2009; Shalev et al. 2013; Bugeja and Loyeung 2015; Paugam, Astolfi, and Ramond 2015; Zhang and Zhang 2017; Lynch, Romney, Stomberg, and Wangerin 2019; Ashby, Chyz, Myers, and Whipple 2020). However, prior research does not consider whether managers exercise discretion over the fair value measurement of deferred revenues assumed in an acquisition. These studies assume that the fair value measurement of acquired assets and liabilities resembles a purchase price allocation. This means that, holding the

deal value constant, a larger fair value measurement of one acquired asset leads to a smaller fair value measurement of another acquired asset. However, the fair value measurement of liabilities in an acquisition does not necessarily resemble a purchase price allocation because, all else equal, an increase (decrease) in the fair value of liabilities leads to an increase (decrease) in goodwill.

Fair value measurement of acquired deferred revenues is of particular concern to managers, institutional investors, and regulators for several reasons. Deferred revenue write-downs have a significant downward impact on post-acquisition GAAP performance (Dickinson, Wangerin, and Wild 2016).<sup>2</sup> Some managers disclose non-GAAP metrics which include a portion of the deferred revenue write-down that would have been earned during the period. The business press refers to these inclusions as “ghost revenues.”<sup>3</sup> Although managers claim that the inclusion is meant to inform investors or increase comparability, recent evidence suggests that non-GAAP revenue that includes ghost revenue is not incrementally more value relevant than GAAP revenue on average (Campbell, Gee, and Wiebe 2020). The U.S. Securities and Exchange Commission (SEC) expresses concerns about non-GAAP metrics that include these adjustments and in some situations issues comment letters either requiring more disclosure or requiring the firm to cease reporting non-GAAP revenue.<sup>4</sup> Furthermore, some firms add back ghost revenues to managers’ performance metrics. This practice has drawn criticism from the business press

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<sup>2</sup> The association between deferred revenue write-downs and future revenues exists because deferred revenue write-downs reduce future revenues recognized by the acquirer. Managers or valuation experts do not predict and assign a fair value to the expected future revenues and then determine what the deferred revenue balance should be. Rather, they begin their valuation with the deferred revenue book value.

<sup>3</sup> See “Companies including Symantec are using ‘ghost revenue’ to calculate bonuses” available from *Marketwatch* (May 17, 2018) at <https://www.marketwatch.com/story/companies-are-using-ghost-revenue-to-calculate-executive-bonuses-2017-11-06>

<sup>4</sup> See “SEC may be set to crack down on companies that adjust revenue” available from *Marketwatch* (November 26, 2019) at <https://www.marketwatch.com/story/sec-may-be-set-to-crack-down-on-companies-that-adjust-revenue-2019-11-22>

which claims that managers use deferred revenue write-downs as a “cookie-jar” reserve to boost cash incentive compensation.<sup>5</sup> Concerns with the usefulness of these non-GAAP performance metrics have led institutional investors to petition the SEC to require more transparency in proxy statements for metrics used in calculating CEO compensation.<sup>6</sup> Given managers’, investors’, and regulators’ growing concerns about ghost revenues and deferred revenues write-downs, research investigating managers’ incentives to adjust deferred revenues write-downs is important.

To the extent managers have discretion over the fair values of deferred revenues, I expect that CEOs’ incentives to reduce the magnitude of deferred revenue write-downs increase with the relative magnitude of cash incentive pay. If CEOs can minimize the magnitude of deferred revenue write-downs, then they reduce potential ghost revenues or revenues that will not be recognized even when acquirers satisfy the performance obligations related to the deferred revenues. By using this strategy, CEOs can maximize their cash incentive compensation by increasing the chances of meeting performance metric targets tied to GAAP revenue. However, the incentive to minimize deferred revenue write-downs is less salient if CEOs’ compensation is based on non-GAAP metrics that either remove the target’s revenues or include ghost revenues.

To examine my research questions, I use a hand-collected sample of 334 material acquisitions from 2003 to 2018, where the SEC requires the acquirer to disclose the previous financial statements of the target and the pro forma financial statements of the combined entity.<sup>7</sup> In the pro forma balance sheets found in forms 8-K/A or S-4, I collect the deferred revenue

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<sup>5</sup> See <https://www.marketwatch.com/story/companies-are-using-ghost-revenue-to-calculate-executive-bonuses-2017-11-06>

<sup>6</sup> See “Investors Push Back on Non-GAAP Comp Metrics” available from *Agenda* (May 13, 2019) at [https://www.agendaweek.com/c/2276373/279923/investors\\_push\\_back\\_gaap\\_comp\\_metrics?referrer\\_module=emailMorningNews&module\\_order=3&code=YkcxNVpYSnpNVFpBZFhSckxtVmtkU3dnTVRFM01USTJNek1zSURReU1EVTJOVEF6T1E9PQ](https://www.agendaweek.com/c/2276373/279923/investors_push_back_gaap_comp_metrics?referrer_module=emailMorningNews&module_order=3&code=YkcxNVpYSnpNVFpBZFhSckxtVmtkU3dnTVRFM01USTJNek1zSURReU1EVTJOVEF6T1E9PQ)

<sup>7</sup> Pro forma refers to the anticipated results of the transaction. In this paper, pro forma does not refer to non-GAAP disclosure.

write-downs disclosed under adjustments made in combining the target and acquirer. In 64 percent of the deals in my sample, I find that the acquirer writes down the target's deferred revenues to fair value. Deferred revenue write-downs appear to be economically significant, with the average write-down reducing future revenue per share by \$0.15.

Next, I use multivariate regression analyses to examine whether the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay. Specifically, I regress deferred revenue write-downs on the proportion of CEO cash incentive pay to CEO total compensation and a vector of control variables. Consistent with my predictions, I find that the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay. My results suggest that a one standard deviation increase in the proportion of cash incentive pay is associated with a 20 percent decrease in the deferred revenue write-downs. This is equivalent to a \$0.03 increase in future revenue per share, on average.

Next, I investigate whether the relation between deferred revenue write-downs and the proportion of CEO cash incentive pay differs when the cash incentive pay is based on non-GAAP metrics that either remove the target's revenues or include ghost revenues. I find that the negative relation between deferred revenue write-downs and the proportion of CEO cash incentive pay does not exist when CEO cash incentive pay is tied to non-GAAP performance metrics that adjust for the target's revenues or ghost revenues. This suggests that the incentives to minimize deferred revenue write-downs are less salient when CEO cash incentive pay is not based on post-acquisition GAAP revenue.

I then explore the impact of each non-GAAP adjustment (either removing the target's revenues or including ghost revenues) on the relation between deferred revenue write-downs and the proportion of CEO cash incentive pay. I find that the negative relation between deferred

revenue write-downs and the proportion of CEO cash incentive pay that I document for executives with incentive pay based on GAAP accounting performance metrics is also present when the cash incentive pay is tied to non-GAAP performance metrics that remove the target's revenues. However, I find that the negative relation between deferred revenue write-downs and the proportion of CEO cash incentive pay does not exist when the cash incentive pay is tied to non-GAAP performance metrics that include ghost revenues. Moreover, I provide evidence that the magnitude of deferred revenue write-downs increases with the proportion of CEO cash incentive pay tied to non-GAAP performance metrics that include ghost revenues.

Finally, I examine whether the occurrence of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay. I find that the occurrence of deferred revenue write-downs does not decrease with the proportion of CEO cash incentive pay. However, economic factors appear to impact the occurrence of deferred revenue write-downs. Moreover, I find that that the proportion of CEO cash incentive pay based on non-GAAP metrics does not impact the occurrence of deferred revenue write-downs. These results suggest that although CEOs may exercise discretion in determining the magnitude of deferred revenue write-downs, their discretion does not extend to avoiding the occurrence of deferred revenue write-downs.

My study makes several contributions to the literature. First, my study is the first to provide evidence that CEO compensation incentives impact the fair value measurement of deferred revenue liabilities in an acquisition. This is significant because most prior research focuses on managers' incentives to adjust fair values of specific assets acquired in an acquisition (Shalev 2009; Shalev et al. 2013; Bugeja and Loyeung 2015; Paugam et al. 2015; Zhang and Zhang 2017; Lynch et al. 2019, Ashby et al. 2020). Furthermore, these studies focus on managers' incentives to adjust asset fair values that impact acquirers' future expenses. For

example, Lynch et al. (2019) find that managers of private firms allocate more of the purchase price to shorter-lived tangible assets in order to increase depreciation and reduce taxable income. My study is the first to provide evidence of managers adjusting deferred revenue fair values to increase future revenues for the acquirer.

Second, my study contributes to the research on non-GAAP disclosure. Recent evidence suggests that non-GAAP earnings per share is more informative when a firm discloses the metric in both the proxy statement and the annual earnings announcement (Black, Black, Christensen, and Gee 2020). However, no research to date investigates the impact of non-GAAP compensation performance metrics on GAAP accounting choices. I provide unique evidence suggesting that certain non-GAAP compensation performance metrics can impact managers' fair value measurement of deferred revenues in acquisitions.

Finally, I examine a setting that has received increased attention from standard setters. The Financial Accounting Standards Board (FASB) has an ongoing project to research the potential alternatives for the recognition and measurement of deferred revenues in business combinations and recently issued a proposed Accounting Standards Update.<sup>8</sup> To the extent that any new accounting standard increases managers' opportunities to exercise discretion in fair value measurement, I provide evidence suggesting that certain managers may exercise discretion in the fair value measurement of deferred revenue to boost post-acquisition revenues.

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<sup>8</sup>The board is currently reviewing the comment letter feedback to the proposed accounting standard update. See details at: [https://www.fasb.org/jsp/FASB/FASBContent\\_C/ProjectUpdateExpandPage&cid=1176175306787](https://www.fasb.org/jsp/FASB/FASBContent_C/ProjectUpdateExpandPage&cid=1176175306787)

## SECTION II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

### Background

Deferred revenues (also known as contract liabilities) are an obligation a firm has to transfer goods or services to a customer for which the firm has received payment from the customer. For instance, airlines most often sell flights to customers who make payments months in advance. Software firms sell products with contracts that obligate the firms to provide services and upgrades in the future. Some manufacturers have sell-through contracts with merchandisers or distributors and are only able to recognize revenue when the product is sold to the final customer. Generally, when firms fulfill the performance obligations, they can reduce the liability balance and recognize revenue.<sup>9</sup>

Acquisitions of targets with deferred revenue liabilities are a common occurrence.<sup>10</sup> One common issue for acquirers of targets with deferred revenue balances is deferred revenue write-downs – often referred to as disappearing revenues<sup>11</sup> or a revenue haircut.<sup>12</sup> Deferred revenue write-downs arise from the differences in accounting treatment of deferred revenues in the normal course of business and of deferred revenues that a firm assumes in a merger or acquisition. Deferred revenues are generally recorded on the target's balance sheet at historical cost (the value of the consideration or payment previously received). However, ASC 805 requires that the acquirer record the target's assets and liabilities at fair value as of the

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<sup>9</sup> Up until the end of 2017, ASC 605 was the prevailing standard for deferred revenue. The FASB replaced ASC 605 with ASC 606 to remove weaknesses in the existing requirements, increase the comparability of revenue recognition practices, and to provide a new framework to address revenue issues. However, under both standards firms record the deferred revenue liability at historical cost, firms do not adjust the book value to fair value each period, and firms must fulfil the performance obligations to reduce the liability balance and recognize revenue.

<sup>10</sup> In my sample of deal observations identified by SDC that merged with the Compustat database, 52% of the public targets had deferred revenues.

<sup>11</sup> <https://www.journalofaccountancy.com/issues/2016/apr/deferred-revenue-accounting-rule-in-acquisition.html>

<sup>12</sup> <https://www.valuationresearch.com/pure-perspectives/whats-haircut-determining-fair-value-deferred-revenue/>

acquisition date.<sup>13</sup> Similar to other assets and liabilities, the historical cost of deferred revenue often differs from its fair market value.

To determine the fair market value of deferred revenue, the acquirer must identify all performance obligations the acquirer assumes, estimate the costs required to fulfill the performance obligations, and estimate a profit mark-up associated with the costs to fulfill the obligation. After estimating the costs and profit mark-up, the acquirer must either use the bottom-up approach or top-down approach to calculate the fair value. The bottom-up approach calculates the fair value of deferred revenue as the costs to fulfill the future performance obligations plus a reasonable mark-up on the costs to be incurred. The top-down approach calculates the fair value by starting with the deferred revenue balance and deducting the previously incurred costs and the associated profit from the incurred costs. With either approach, the fair value should reflect what a third party would be willing to receive in exchange for assuming the deferred revenue liability and performance obligations. If a third party would incur lower costs for the future performance obligations and/or would be willing to accept a lower profit than the target's normal profit, then the acquirer should write down deferred revenues.<sup>14, 15</sup>

Deferred revenue write-downs can have a significant impact on post-acquisition performance. Dickinson et al. (2016) investigate how acquisition accounting methods may partially explain why many mergers and acquisitions show subsequent reduced firm

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<sup>13</sup> SFAS 141 (effective July 2001) was updated in December 2008, to SFAS 141R, to improve the relevance of business combination reporting by updating the treatment of certain acquisition costs and target assets. Both SFAS 141 and SFAS 141R (now codified as ASC 805) require that the acquirer record the target's assets and liabilities at their fair values as of the acquisition date.

<sup>14</sup> It is also possible that deferred revenues can have a fair value write-up. However, this may be a sign that the target firm is underperforming and could have accepted a larger profit mark-up on the goods or services provided. Because write-ups are outside the scope of this paper and these particular acquisitions may be significantly different from normal acquisitions, I exclude observations in my sample where the acquirer writes up deferred revenues.

<sup>15</sup> See <http://www.globalviewadvisors.com/wp-content/uploads/2016/05/FVLE-Issue-59-Deferred-Revenue-Valuation-for-Accounting-Standards-Codification-805-Article-by-Ray-Rath-Feb-Mar16.pdf>

performance. They find that part of the decrease in post-acquisition performance stems from fair value adjustments that lower future gross profit margins through write-ups in inventory values and write-downs in deferred revenues. In additional analyses, Dickinson et al. (2016) find that investors and analysts do not appear to understand how these fair value adjustments negatively impact gross margins. Dickinson et al. (2016) conclude that acquisition accounting standards requiring write-downs of deferred revenue and write-ups of inventory masks some of the synergistic efficiencies of the combined entity.

In response to these deferred revenue write-downs affecting post-acquisition performance, some firms report non-GAAP revenues in earnings announcements with an adjustment for ghost revenues. Although managers often disclose that this adjustment is meant to inform investors or increase comparability, the inclusion of ghost revenues in non-GAAP revenues is not incrementally more value-relevant than GAAP revenues (Campbell et al. 2020). The SEC responds to these disclosures by issuing comment letters to some firms requiring managers to disclose why they are reporting deferred revenue adjustments or by requiring managers to cease reporting the adjusted revenue metrics.<sup>16</sup> Some of these firms also add back ghost revenues to managers' cash incentive performance metrics, drawing criticism from the business press which claims that managers use these write-downs as a "cookie-jar" reserve used to boost cash incentive compensation.<sup>17</sup> Concerns with the transparency of non-GAAP performance metrics have led the Council of Institutional Investors to petition the SEC to amend

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<sup>16</sup> See <https://www.marketwatch.com/story/sec-may-be-set-to-crack-down-on-companies-that-adjust-revenue-2019-11-22>

<sup>17</sup> See <https://www.marketwatch.com/story/companies-are-using-ghost-revenue-to-calculate-executive-bonuses-2017-11-06>

Regulation G and require firms using non-GAAP financial metrics in calculating cash incentive to reconcile the adjusted metrics to GAAP metrics in the compensation discussion and analysis.<sup>18</sup>

Due to managers', investors', and regulators' concerns with deferred revenue write-downs, the FASB initiated a project to research potential alternatives for the recognition and measurement of deferred revenues in business combinations.<sup>19</sup> Recently, the board issued proposed Accounting Standards Update *Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers*.<sup>20</sup> The proposed standard would require firms to recognize assumed deferred revenues following ASC 606. Specifically, the board proposed that the timing of payment of consideration on a contract should no longer affect the amount of revenue recognized by the acquirer. Based on the current standard, an acquirer would recognize more revenue for the same performance obligations if the target's contract with customers requires payments over time rather than full payment in advance of the performance obligations. Removing the effect of payment timing on revenue contracts would change the accounting for acquired deferred revenue. Due to the board's concerns with the potential costs and benefits of implementing a new standard, research investigating managers' incentives to adjust deferred revenue write-downs under the current standard is timely and important.

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<sup>18</sup> See the Council of Institutional Investors' petition at [https://www.cii.org/files/issues\\_and\\_advocacy/correspondence/2019/20190426%20CII%20Petition%20revised%20on%20non-GAAP%20financials%20in%20proxy%20statement%20CDAs.pdf](https://www.cii.org/files/issues_and_advocacy/correspondence/2019/20190426%20CII%20Petition%20revised%20on%20non-GAAP%20financials%20in%20proxy%20statement%20CDAs.pdf)

<sup>19</sup> See FASB's research project list under "Recognition and Measurement of Revenue Contracts with Customers under Topic 805" for details at: [https://www.fasb.org/cs/ContentServer?c=FASBContent\\_C&cid=1176169433424&d=&pagename=FASB%2FFASBContent\\_C%2FProjectUpdatePage#Recognition\\_Measurement](https://www.fasb.org/cs/ContentServer?c=FASBContent_C&cid=1176169433424&d=&pagename=FASB%2FFASBContent_C%2FProjectUpdatePage#Recognition_Measurement)

<sup>20</sup> The board is currently reviewing the comment letter feedback to the proposed accounting standard update. See details at: [https://www.fasb.org/jsp/FASB/FASBContent\\_C/ProjectUpdateExpandPage&cid=1176175306787](https://www.fasb.org/jsp/FASB/FASBContent_C/ProjectUpdateExpandPage&cid=1176175306787)

## **Deferred Revenue Literature**

Prior research generally focuses on the impact of previous regulations on the decision usefulness of revenues and deferred revenues. Standard setters issued the Statement of Position (SOP) 97-2 in December of 1997 to mitigate software firms' ability to shift between deferred revenues and revenue across reporting periods. Following its implementation, firms were less likely to manage earnings via discretionary revenue estimates, but the overall value relevance of earnings decreased (Srivastava 2014). Two years later, the SEC issued Staff Accounting Bulletin (SAB) no. 101 to restrict accelerated revenue recognition. Evidence suggests that SAB no. 101 led to a decrease in the likelihood of firms meeting earnings benchmarks (Altamuro et al. 2005). However, evidence of managers' opportunistic use of discretion in deferred revenues remains (Caylor 2010). Other research suggests that the prevailing standards led to mismatching of revenues and expenses as evidenced by changes in deferred revenues adversely affecting the persistence of profit margins (Prakash and Sinha 2013).

In 2010, the FASB adopted both ASU 2009-13 to address accounting for transactions with multiple deliverables and ASU 2009-14 to amend SOP 97-2 to improve the usefulness of revenues by allowing managers more discretion. Recent evidence suggests that these updates lead to an increase in the value relevance of revenues and earnings, with no evidence of a decrease in the faithful representation of reported revenues (Myers et al. 2020).

Overall, research provides some evidence that managers exercise discretion over deferred revenue for either informative or opportunistic reasons. However, no research to date investigates the determinants of deferred revenue fair values (or write-downs) in an acquisition or managers' incentives to exercise discretion over deferred revenue fair values.

## **Fair Value Literature**

Fair value measurement of assets and liabilities requires judgment and allows managers to exercise discretion. Prior studies find mixed evidence of manager opportunism in fair value measurement. Early studies find that banks' fair value disclosures of loans, securities, long-term debt, and financial instruments are value relevant (Barth 1994; Barth et al. 1996; Eccher et al. 1996; Nelson 1996). Fair value estimates of investment properties tend to be more accurate measures of selling prices than historical costs (Dietrich, Harris, and Muller 2000). More recent evidence suggests that fair value measurement reduces information asymmetry among investors (Fontes, Panaretou, and Peasnell 2018) and better reflects banks' credit risk (Blankespoor, Linsmeier, Petroni, and Shakespeare 2013). In contrast, some evidence suggests that managers exercise discretion in fair value-based goodwill impairment tests by delaying or reducing the occurrence of goodwill impairments (Beatty and Weber 2006; Ramanna and Watts 2012; Li and Sloan 2017). CEOs exercise discretion in determining gains from asset securitizations and are rewarded for gains they report (Dechow, Myers, and Shakespeare 2010). More recent studies find that the relevance of fair values may depend on the nature of the information used in fair value measurement. SFAS no. 157 requires the disclosure of the level of inputs used to generate the fair values (i.e. Levels 1, 2, and 3). Evidence suggests that Level 3 measurement of assets and liabilities, which requires the greatest amount of judgment, leads to increased analyst forecast dispersions and is less value relevant than other levels of measurement (Song, Thomas, and Yi 2010; Magnan, Menini, and Parbonetti 2015).

Research suggests that managers exercise discretion in fair values of assets assumed in an acquisition following the implementation of SFAS 141 and SFAS 141R. A majority of acquired assets, being intangible assets and goodwill, do not have quoted market prices which allow

managers to exercise discretion by choosing from a reasonable range of possible values (Zhang and Zhang 2017; Lynch et al. 2019). Managers have incentives to exercise discretion in assigning fair values to assets and liabilities in an acquisition (also referred to as a purchase price allocation) to mitigate the negative impact acquired assets (and liabilities) can have on earnings. For example, larger allocations to tangible and definite-lived intangible assets increase depreciation and amortization expense, respectively, whereas allocations to goodwill are not amortized but are subject to impairment testing. Most purchase price allocation research focuses on managers' incentives to "over-allocate" the purchase price to goodwill (Shalev 2009; Shalev et al. 2013; Bugeja and Loyeung 2015; Paugam et al. 2015; Zhang and Zhang 2017). Specifically, some studies find evidence that the proportion of the purchase price allocated to goodwill increases with the proportion of bonuses in CEOs' pay packages consistent with managers allocating more to goodwill to reduce amortization and depreciation (Shalev et al. 2013; Bugeja and Loyeung 2015). Ashby et al. (2020) find that managers who report non-GAAP earnings excluding amortization expense allocate more of the purchase price to definite-lived intangible assets and less of the purchase price to tangible assets. Finally, Lynch et al. (2019) find that managers of private firms, who bear lower financial reporting costs, have tax incentives to allocate more of the purchase price to tangible assets which increases depreciation and reduces taxable income.

In contrast to conclusions drawn from the purchase price allocation literature, recent research has highlighted evidence of the overall decision usefulness of fair value accounting in acquisitions. Particularly, the recorded fair values of acquired intangibles are predictive of future operating incomes and are positively associated with equity prices (King, Linsmeir, and Wangerin 2019; McInnis and Monsen 2020). Additionally, the aggregate fair value adjustments

made to a target are predictive of post-acquisition cash flows (Blann, Campbell, Shipman, and Wiebe 2020). However, this relation only exists when the target and acquirer are in the same industry, when the target does not have significant research and development costs, and when managers have less incentive to inflate goodwill balances (Blann et al. 2020).

Overall, prior research provides some evidence of managers exercising discretion in fair values and, in some scenarios, being rewarded for doing so (e.g., Dechow et al. 2010; Shalev et al. 2013). However, no prior research investigates whether managers exercise discretion over the fair value measurement of deferred revenues. The extant merger and acquisition research assumes that the fair value measurement of acquired assets and liabilities resembles a purchase price allocation. This means that, holding the deal value constant, a larger allocation to an acquired asset leads to a smaller allocation of another acquired asset. However, the fair value measurement of liabilities in an acquisition does not mechanically resemble an allocation choice because an increase (decrease) in the fair value of an assumed liability leads to an increase (decrease) in an acquired asset (most likely goodwill). Because the fair value measurement of liabilities does not resemble a purchase price allocation, it is not initially clear whether the incentives to adjust the fair values of assumed liabilities are similar to the incentives to adjust the fair values of acquired assets.

### **Hypothesis Development**

I begin motivating my hypotheses using a stylized example comparing two scenarios with different valuations of a target's deferred revenue assumed by an acquirer in an acquisition on the first day of the acquirer's fiscal year. The first scenario shows the outcome of an acquisition with no deferred revenue write-down. The second scenario shows the outcome of an acquisition with a deferred revenue write-down. In each scenario, I assume that the target's deal value is

\$781 million. I also assume the target's sales for the acquisition year would have been \$732 million had it not been acquired and had it not written down any deferred revenue. I further assume that the acquirer's sales excluding the target's sales are \$1.574 billion. Additionally, I assume that the fair value for all assets except goodwill is \$582 million, and the fair value for all liabilities other than deferred revenues is \$209 million. Finally, I assume that the book value of deferred revenue is \$42 million, all the performance obligations associated with the \$42 million in deferred revenue on the target books will be fulfilled in the fiscal year of the acquisition, and that the deferred revenue write-down in scenario (2) is \$16 million.<sup>21</sup>

Scenario	(1)	(2)
Purchase Price Allocation	No Deferred Revenue Write-Down	Deferred Revenue Write-Down
Tangible and Intangible Assets other than Goodwill	\$582,000,000	\$582,000,000
Goodwill	\$450,000,000	\$434,000,000
Liabilities other than Deferred Revenue	(\$209,000,000)	(\$209,000,000)
Deferred Revenue (Book Value = \$42 million)	<u>(\$42,000,000)</u>	<u>(\$26,000,000)</u>
Total Deal Value	<u>\$781,000,000</u>	<u>\$781,000,000</u>
Acquisition Year Revenue Results		
Acquirer's Revenue (Pro-forma)	1,574,000,000	1,574,000,000
Target's Revenue (Pro-forma)	732,000,000	716,000,000
Combined Revenue	2,306,000,000	2,290,000,000
Decrease in Revenue		<u>16,000,000</u>
Acquirer's Diluted Shares		109,000,000

<sup>21</sup> All values in this stylized example roughly approximate the average values found in my sample of 334 deal observation used in this study.

Per-share impact of write-down

\$ 0.15

When comparing the scenarios, it is clear that the acquirer has the largest GAAP revenue in scenario (1) where there is no deferred revenue write-down. When taking the difference between the two scenarios, a \$16 million decrease in current deferred revenues leads to a \$0.15 per share decrease in the acquirer's post-acquisition revenue. With acquirers' average post-acquisition earnings being \$0.54 per share in my sample, all else equal, a deferred revenue write-down could remove more than a quarter of the acquirer's post-acquisition earnings. This stylized example highlights the material impact of deferred revenue write-downs on an acquirer's post-acquisition performance.

When holding the deal value constant, any changes in the recorded value of deferred revenues will also alter the goodwill fair value, as shown in my stylized example. Any increase (decrease) in the deferred revenue write-down is associated with a decrease (increase) in goodwill. Additionally, Shalev et al. (2013) find that the proportion of the purchase price recorded as goodwill increases with the proportion of bonus compensation in a CEO's pay package.<sup>22</sup> The fair value of goodwill may impact managers' incentives to adjust the fair value of deferred revenues. The risk of future impairments increases with the allocation of goodwill (Paugam et al. 2015). However, there is a limit to increasing the goodwill allocation that occurs with an adjustment to deferred revenue write-downs. The largest goodwill fair value occurs with no deferred revenue write-down.<sup>23</sup> Due to this

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<sup>22</sup> In untabulated analyses, I validate this finding. In this study, I do not investigate the consequences of the resulting goodwill allocation, or the impact of bonus compensation on the allocation to goodwill. However, I control for the allocation to goodwill in my main regressions to remove any confounding effects impacting the relation between the CEO cash incentive pay and deferred revenue write-downs. My inferences hold when I re-estimate without including the goodwill allocation in the regressions.

<sup>23</sup> It is also possible that deferred revenues can have a fair value write-up, leading to higher goodwill allocations. However, this occurrence is rare. Because write-ups are outside the scope of this paper and these particular acquisitions may be significantly different from normal acquisitions, I exclude observations in my sample where the acquirer writes up deferred revenues. Only 5 observations were dropped due to a deferred revenue write-up.

limitation, it is not clear that minimizing a deferred revenue write-down would lead to an “abnormal allocation” or “over-allocation” of goodwill that could lead to a significant increase in impairment risk. Additionally, an increase in goodwill would not impact managers' performance metrics in the short term, due to managers' ability to delay or reduce the occurrence of goodwill impairments (e.g., Beatty and Weber 2006; Ramanna and Watts 2012; Li and Sloan 2017).

If a CEO can exercise discretion over the fair values of deferred revenues, I expect that the CEO's incentives to reduce the magnitude of a deferred revenue write-down increase with the relative importance of the cash incentive pay.<sup>24</sup> Bonuses or non-equity incentive pay are more likely than other forms of compensation to increase with an increase in accounting performance metrics (Shalev et al. 2013). Prior research highlights that a majority of firms use multiple accounting metrics like reporting earnings, EBIT, or sales as performance measures (all of which are directly impacted by the target's revenues post-acquisition) to determine CEO bonuses (Murphy 1999). Additionally, some research finds that CEO cash compensation is positively associated with accounting performance metrics (Core, Guay, and Verrecchia 2003) and that the relative importance of accounting metric-based pay is positively associated with earnings management (Larcker, Richardson, and Tuna 2007). Overall, I expect that CEOs whose

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<sup>24</sup> Note that I do not claim the CEOs are solely in charge of assigning the fair values of deferred revenue in an acquisition, but I focus on CEOs because they are the ultimate decisions makers. In addition, CEOs are likely aware of the impact of fair values of assets and liabilities on future firm performance. I expect managers, valuation experts, and/or the CFO to provide projections of the impact of an acquisition on future performance to CEOs, and if CEOs believe that these projections are understated, the CEO may request that the valuations of assets and liabilities be adjusted. CEOs are likely to hire managers who agree with their point of view and who are incentivized to support the CEOs' preferences. Therefore, lower-level managers may adjust deferred revenue fair values if requested to do so. Although I do not claim that all CEOs or managers will intentionally manipulate deferred revenue fair values, I do assert that managers have implicit biases concerning the valuation of assets and liabilities as well as reported performance and may be likely to adjust fair values to be consistent with those preferences.

cash incentive pay constitutes a larger portion of their annual pay are likely to benefit more from reducing the magnitude of deferred revenue write-downs. This leads to the first hypothesis:

*H1: The magnitude of deferred revenue write-downs is smaller when the proportion of CEO cash incentive pay is larger.*

My predicted relation between deferred revenue write-downs and the proportion of CEO cash incentive pay can be attenuated for a few reasons. First, valuation experts and auditors constrain managers' discretion over the fair value measurement of deferred revenues. Auditors and valuation experts may approach their review of liabilities with greater scrutiny than assets. However, valuation is subjective and even with the scrutiny of valuation experts and auditors, managers can assign a range of appropriate fair values for the assets and liabilities assumed in the acquisition. Additionally, auditors and valuation experts are more likely to be concerned about an understatement of liabilities than an overstatement of liabilities and may mistakenly apply more scrutiny to smaller deferred revenue fair values than larger deferred revenue fair values. Second, there is plausibly less judgment involved in determining the fair values of deferred revenues than for acquired assets. This is because significant asset classes such as intangible assets, are more likely than deferred revenues to be firm-specific and firm-specific assets tend to require more judgment. However, there is still a considerable amount of judgment involved in assessing the fair value of deferred revenues. Managers need to consider multiple factors related to the fair value of deferred revenues including cost overhead allocations, estimation of the profit mark-up, multiple element arrangements, and discount rates. Third, if CEOs do not consider bonus compensation important, incentives to exercise discretion over the fair values of deferred revenues may not exist. Some research provides evidence suggesting that cash compensation plays a limited role in providing incentives to managers, inferring that bonus

or non-equity incentive compensation may not significantly affect managers' choices (Core, Guay and Verrecchia 2003). However, Murphy (2013) argues that CEOs better understand the impact of their actions on accounting metrics than on stock prices, and bonuses tied to these metrics are more tangible and immediate than compensation tied to equity. Additionally, some research investigating the impact of bonus compensation suggests that bonuses can affect managers' accounting choices (Aboody, Kasznik, and Williams 2000; Shalev et al. 2013). Finally, CEOs may face potential post-acquisition consequences as a result of adjusting the fair value of deferred revenues. For example, the SEC issues comment letters to acquirers regarding the fair value measurement of acquired assets and liabilities (Lynch et al. 2019). Potential SEC scrutiny may constrain managers' discretion over the fair value of deferred revenues. Furthermore, the reputational cost of receiving a comment letter addressing fair value measurement may also constrain managers' discretion.

Although prior research finds that accounting-based metrics tied to GAAP revenue are the most popular performance metrics in cash incentive pay compensation, many firms use non-GAAP performance metrics. Recent research finds that approximately 15 percent of firms disclose a non-GAAP earnings per share performance metric in their proxy statements (Black et al. 2020). Additionally, some evidence suggests that CEO pay is abnormally high when non-GAAP earnings significantly exceed GAAP earnings (Guest, Kothari, and Pozen 2020). In recent years, firms have started reporting non-GAAP revenue metrics, with 20 percent of earnings announcements including a non-GAAP revenue measure (Campbell et al. 2020). Some common adjustments include removing revenues resulting from mergers and acquisitions (M&A) (commonly called organic revenues) or including a portion of the deferred revenue write-down (i.e. ghost revenues) from an acquisition. Campbell et al. (2020) find that 43.3 percent of firms

that report non-GAAP revenue in the earnings announcement adjust for changes to the reporting entity (M&A, and divestitures), and 8.3 percent include ghost revenues. I expect CEOs with a larger proportion of cash incentive pay tied to a non-GAAP metric adjusted for the target's revenues or ghost revenues to be less likely to directly benefit from reducing the magnitude of deferred revenue write-down. I also expect these CEOs to write down more of the deferred revenue relative to CEOs with a larger proportion of cash incentive pay based on performance metrics tied to GAAP revenue. This leads to the second hypothesis:

*H2: The magnitude of deferred revenue write-downs is larger when the proportion of CEO cash incentive pay tied to non-GAAP metrics that adjust for the target's revenue or ghost revenues is larger.*

### SECTION III. EMPIRICAL METHODOLOGY

#### Data

To test my hypotheses, I use a hand-collected sample of deal observations where the acquirer assumes the target's deferred revenue and discloses whether or not a write-down occurred. To create this sample, I first use Securities Data Company (SDC) Platinum to identify completed business combinations with completion dates between January 1, 2003 and December 31, 2018. I restrict the sample to U.S. public acquirers that merge with Compustat, and I exclude observations where either the acquirer or target are in the financial or utility sectors following Prakash and Sinha (2013). Next, I restrict the sample to material acquisitions where the acquirer is required by the SEC to disclose the target's financial statements similar to the sample selection criteria in Chen (2019). An acquirer determines whether additional disclosure is required by using one of three tests defined in Regulation S-X. These tests are the following:

1. Asset Test: If the target's assets exceed 20 percent of the acquirer's pre-acquisition assets, then disclosure of the target's financial statements is required.
2. Investment Test: If the purchase price of the target exceeds 20 percent of the acquirer's pre-acquisition assets, then disclosure of the target's financial statements is required.
3. Income Test: If the target's pre-acquisition pre-tax income exceeds 20 percent of the acquirer's pre-acquisition pre-tax income, then disclosure of the target's financial statements is required.

To determine whether or not a target meets the disclosure requirements, I restrict my sample to firms where the deal value exceeds 20 percent of the acquirer's pre-acquisition total assets. For public targets, if the acquisition does not pass the investment test, I include the

sample of deal observations where the results of the income test or assets test exceed the 20 percent threshold. Next, I determine which deal observations in my sample will likely disclose a deferred revenue balance in the financial statements. For public targets, I restrict the sample to target firms where deferred revenue is populated in Compustat in the fiscal year before the acquisition. For all other targets, I restrict the sample to firms where the deferred revenue for the acquirer is populated in Compustat in the fiscal year following the acquisition.

Unless already recorded in the acquirer's financial statements, the acquirer is required to report the balance sheet of the acquirer, the balance sheet of the target, and the combination of the two entities with any adjustments. If the acquirer assumes the target's deferred revenue balance and the deferred revenues are written down, then the acquirer discloses the write-down in the adjustments. I examine the acquirer's 8-K/A or S-4 filings for the acquisition and collect the deferred revenue book values, deferred revenue fair values, deferred revenue write-downs, and other control variables from the disclosed financial statements of the target. I exclude observations where there is no deferred revenue balance disclosed, no pro forma balance sheet, or no filings available. I also remove observations where the acquirer writes up the target's deferred revenue balance.

Next, I merge ExecuComp to the hand-collected dataset for CEO compensation data. For all deal observations where ExecuComp data is unavailable, I hand-collect the required information related to the CEO's compensation from the DEF 14A for the fiscal year of the acquisition completion. Using the SEC Analytics suite on the Wharton research data services (WRDS) website, I collect the links to the DEF 14A for the acquisition completion fiscal year. If no links were present, I use SEC's EDGAR to collect the DEF 14A filing link. To investigate the impact of different performance metrics on the magnitude of deferred revenue write-downs, I

collect the financial metrics used to assess the CEO’s annual performance and to calculate their short-term cash incentive compensation. I also use data from Compustat and the Center for Research in Security Prices (CRSP) to construct other control variables. I summarize my sample selection procedure in Table 1. Of the 810 observations identified as acquisitions that meet the SEC’s disclosure requirements and have a deferred revenue balance, 334 satisfy my data restrictions.

## Research Design

To test my first hypothesis regarding the magnitude of deferred revenue write-downs, I regress *Def Rev Write Down* on my variables of interest and control variables using the following ordinary least squares regression model:

$$\begin{aligned}
 \text{Def Rev Write Down} = & \beta_0 + \beta_1(\text{Bonus, NEIP, or Bonus/NEIP}) + \beta_2\text{CAR} + \\
 & \beta_3\text{TrgPM} + \beta_4\text{AcqPM} + \beta_5\text{PeerPM} + \beta_6\text{TrgPublic} + \beta_7\text{PctStock} + \\
 & \beta_8\text{Relative} + \beta_9\text{Deal Size} + \beta_{10}\text{SameInd} + \beta_{11}\text{AcqMTB} + \beta_{12}\text{Goodwill} + \\
 & \text{Trg Industry FE} + \text{Year FE} + \varepsilon
 \end{aligned} \tag{1}$$

The dependent variable, *Def Rev Write Down*, is equal to the difference between the book value and the fair value of deferred revenue assumed in the acquisition as disclosed in the pro forma balance sheet or the deferred revenue write-down disclosed in the adjustment section of the pro forma balance sheet divided by the deal value. To measure the relative importance of CEO cash incentive pay, I use three different proxies derived from variables used in prior research (Cadman, Carter, and Hillegeist 2010; Shalev et al. 2013). The first, *Bonus*, is the CEO’s bonus compensation scaled by the CEO’s total compensation. The second, *NEIP*, is the CEO’s non-equity incentive pay compensation scaled by the CEO’s total compensation. The third, *Bonus/NEIP*, is the sum of the CEO’s bonus and non-equity incentive pay compensation

scaled by the CEO's total compensation. A negative and significant  $\beta_1$  coefficient on each of the incentive pay proxies would be consistent with my prediction that the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay.

To test my second hypothesis, I augment equation (1) to include *NG*, an indicator variable set equal to 1 if the cash incentive pay is tied to a non-GAAP metric that either removes the target's revenue or includes ghost revenues, and 0 otherwise. I also include interactions between *NG* and each of the incentive pay variables. Given these adjustments, I use the following ordinary least squares model:

$$\begin{aligned}
 \text{Def Rev Write Down} = & \delta_0 + \delta_1(\text{Bonus, NEIP, or Bonus/NEIP}) + \delta_2\text{NG} + \\
 & + \delta_3\text{NG} * (\text{Bonus, NEIP, or Bonus/NEIP}) + \delta_4\text{CAR} + \delta_5\text{TrgPM} + \\
 & \delta_6\text{AcqPM} + \delta_7\text{PeerPM} + \delta_8\text{TrgPublic} + \delta_9\text{PctStock} + \delta_{10}\text{Relative} + \\
 & \delta_{11}\text{Deal Size} + \delta_{12}\text{SameInd} + \delta_{13}\text{AcqMTB} + \delta_{14}\text{Goodwill} + \\
 & \text{Trg Industry FE} + \text{Year FE} + \varepsilon
 \end{aligned} \tag{2}$$

A positive and significant coefficient on  $\delta_3$  would be consistent with my prediction that the magnitude of deferred revenue write-downs increases with the proportion of CEO cash incentive pay when tied to non-GAAP metrics. Detailed variable definitions for each test variable are available in the Appendix.

## SECTION IV. EMPIRICAL RESULTS

### Descriptive Statistics

Table 2 provides descriptive statistics for all variables used in my analyses.<sup>25</sup> The mean (median) deal value for acquisition observations in my sample is \$780.7 million (\$186 million). The mean deferred revenue assumed in the acquisition (at book value) is \$41.93 million. Acquirers write down deferred revenues 64 percent of the time, suggesting that this is a common occurrence. Acquirers write down 32 percent of the book value of acquired deferred revenue, on average. When scaled by the number of shares used to calculate earnings per share, deferred revenues amounting to \$0.15 per share will never be recognized or recorded as revenue following the acquisition, on average. I find that almost 20 percent of total CEO compensation is cash-based incentive pay, on average.

Table 3 provides descriptive statistics for each of the variables used in my analyses where the observations are partitioned based on whether or not the deferred revenues assumed in the acquisition were written down (*Write-Down*). I find that *Bonus* is larger for acquirers that do not write down deferred revenues than for acquirers that write down deferred revenues (.113 versus .059; t-stat= 2.983). However, I find that *NEIP* is larger for acquirers that write down deferred revenues than for acquirers that do not write down deferred revenues (.090 versus .122; t-stat=-1.926). I also find that *Bonus/NEIP* for the acquirers that write down deferred revenues is not statistically different from acquirers that do not write down deferred revenues (.204 versus .182;

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<sup>25</sup>In untabulated analyses, I investigate whether my inferences hold after addressing potential concerns about influential observations. Summary statistics in Table 2 reveal that even after winsorizing all continuous variables that are included in the regressions at the 1st and 99th percentiles, there are still extreme values at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. I calculate DFBETAs for my variables of interest and re-estimate equations (1) and (2) after removing the observations considered influential ( $DFBETA > 2/\sqrt{n}$ ). All inferences hold after removing 17 influential observations.

t-stat= 1.111). These inconsistent and preliminary results may be occurring due to other characteristics of the acquirers or targets. Therefore, I perform multivariate analyses to control for other potential determinants of deferred revenue write-downs.

### **Testing Hypothesis 1**

Table 4 presents the results from estimating equation (1) investigating whether the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay. I estimate the regression three times using either *Bonus*, *NEIP*, or *Bonus/NEIP*, in columns (1), (2), and (3), respectively. In each of the regressions, I find that the coefficients on *Bonus*, *NEIP*, or *Bonus/NEIP* are negative and statistically significant.<sup>26</sup> These results suggest that the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay. Using the coefficient estimate on *Bonus/NEIP* in column (3), the results suggest that a one standard deviation increase in the *Bonus/NEIP* leads to a decrease of \$3.11 million in the deferred revenue write-down or a \$3.11 million increase in post-acquisition GAAP revenues. Using the average of 109 million diluted shares for the acquirers in my sample, this equates to a \$0.03 per share increase in future revenues. Overall, the results in Table 4 suggest that CEOs with larger proportions of cash incentive pay based on accounting performance metrics reduce the magnitude of the deferred revenue write-down and potential ghost revenues.

### **Testing Hypothesis 2**

Table 5 presents the results from estimating equation (2) investigating whether the relation between deferred revenue write-downs and the proportion of CEO cash incentive pay differs when the cash incentive pay is based on non-GAAP metrics that adjust for the target's

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<sup>26</sup> Because 35.6 percent of my sample contains zero values for deferred revenue write-downs, using OLS to estimate the model potentially raises concerns that I might observe biased coefficients on my incentive pay variables due to a zero-inflated dependent variable. My inferences hold when I re-estimate equation (1) using a Tobit regression with and without fixed effects.

revenues or ghost revenues. I find that the coefficients on *Bonus*, *NEIP*, and *Bonus/NEIP* are negative and statistically significant. These results suggest that the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay when the incentive pay is tied to performance metrics that do not adjust for the target's revenues or deferred revenues. Additionally, I find in columns (2) and (3) the interactions *NEIP\*NG* and *Bonus/NEIP\*NG* are positive and statistically significant. F-test results reveal that the combination of the coefficients on the incentive pay variables (*Bonus*, *NEIP*, and *Bonus/NEIP*) and their respective interactions with *NG* (*Bonus\*NG*, *NEIP\*NG*, and *Bonus/NEIP\*NG*) are not significantly different from zero. These results suggest that the negative relation between deferred revenue write-downs and the proportion of CEO cash incentive pay does not exist when the cash incentive pay is tied to non-GAAP performance metrics that adjust for the target's revenues or ghost revenues. Overall, the results in Table 5 suggest that CEOs with larger proportions of cash incentive pay based on non-GAAP performance metrics that adjust for the target's revenues or ghost revenues do not reduce the magnitude of deferred revenue write-downs.

## SECTION V. ADDITIONAL ANALYSES

### Non-GAAP Adjustments

Because Table 5 results suggest that the negative relation between deferred revenue write-downs and the proportion of CEO cash incentive pay does not exist when the cash incentive pay is tied to certain non-GAAP performance metrics, I next explore the impact of each non-GAAP adjustment. To do this, in Table 6, I re-estimate equation (2) replacing *NG* with *NG organic* in columns (1) – (3), and *NG Def Rev* in columns (4) – (6). *NG organic* is an indicator variable set equal to 1 if the CEO's cash incentive pay is tied to a non-GAAP metric that excludes the target's revenue, and 0 otherwise. *NG Def Rev* is an indicator variable set equal to 1 if the CEO's cash incentive pay is tied to a non-GAAP metric that includes ghost revenues, and 0 otherwise. Consistent with prior results and my first hypothesis, I find that the coefficients on *Bonus*, *NEIP*, and *Bonus/NEIP* are negative and statistically significant.

I find in columns (1) – (3) that the interactions *Bonus\*NG organic*, *NEIP\*NG organic*, and *Bonus/NEIP\*NG organic* are statistically insignificant. F-test results reveal that the combination of the coefficients on the incentive pay variables and their respective interactions with *NG organic* are not significantly different from zero except for *NEIP* and *NEIP\*NG organic*. These results suggest that the negative relation between deferred revenue write-downs and the proportion of CEO cash incentive pay exists when the cash incentive pay is tied to non-GAAP performance metrics that adjust for the target's revenues.

Additionally, I find in columns (5) and (6) that the interactions *NEIP\*NG Def Rev* and *Bonus/NEIP\*NG Def Rev* are positive and statistically significant. F-test results reveal that the combination of the coefficients on the incentive pay variables and their respective interactions with *NG Def Rev* are significantly different from zero except for *Bonus* and *Bonus\*NG Def Rev*. These results suggest that the negative relation between deferred revenue write-downs and the

proportion of CEO cash incentive pay does not exist when the cash incentive pay is tied to non-GAAP performance metrics that adjust for ghost revenues. Moreover, the significant F-test results in columns (5) and (6) suggest that the magnitude of deferred revenue write-downs increases with the proportion of CEO cash incentive pay tied to non-GAAP performance metrics that adjust for ghost revenues (F-test P-values <0.01). Overall, the results in Table 7 suggest that CEOs with larger proportions of cash incentive pay based on non-GAAP performance metrics that adjust for ghost revenues do not minimize deferred revenue write-downs.

### **Deferred Revenue Write-Down Occurrence**

Next, I investigate whether the occurrence of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay. To test this research question, I regress the indicator *Write Down* on the same variables of interest and control variables contained in the model (1) using the following linear probability model:

$$\begin{aligned} \text{Prob}(\textit{Write Down} = 1|X) = & \alpha_0 + \alpha_1(\textit{Bonus}, \textit{NEIP}, \textit{or Bonus/NEIP}) + \alpha_2\textit{CAR} + \\ & \alpha_3\textit{TrgPM} + \alpha_4\textit{AcqPM} + \alpha_5\textit{PeerPM} + \alpha_6\textit{TrgPublic} + \alpha_7\textit{PctStock} + \\ & \alpha_8\textit{Relative} + \alpha_9\textit{Deal Size} + \alpha_{10}\textit{SameInd} + \alpha_{11}\textit{AcqMTB} + \alpha_{12}\textit{Goodwill} + \\ & \textit{Trg Industry FE} + \textit{Year FE} + \varepsilon \end{aligned} \quad (3)$$

The dependent variable, *Write Down*, is an indicator variable set equal to 1 if the acquirer disclosed in the pro forma balance sheet a write-down of the target's deferred revenue assumed in the acquisition, and 0 otherwise. Similar to equation (1), a negative and significant  $\alpha_1$  coefficient on each of the incentive pay proxies would be consistent with the occurrence of deferred revenue write-down decreasing with the proportion of CEO cash incentive pay.

Table 7 presents the results from estimating equation (3) investigating whether the occurrence of deferred revenue write-downs decreases with the proportion of CEO cash

incentive pay. Similar to Table 4, I estimate the regression three times using either *Bonus*, *NEIP*, or *Bonus/NEIP*, in columns (1), (2), and (3), respectively. In each of the regressions, I find that the coefficients on *Bonus*, *NEIP*, or *Bonus/NEIP* are negative and statistically insignificant.<sup>27</sup> These results suggest that the occurrence of deferred revenue write-downs does not decrease with the proportion of CEO cash incentive pay. I find that that the occurrence of write-downs increases with the deferred revenue book value (*Def Rev (Book)*), the size of the target (*DealSize*), and the size of the acquirer (*Relative*). These results are consistent with larger balances of deferred revenue and larger entities being subject to more scrutiny from valuation experts, auditors, and/or regulators. I also find that the occurrence of deferred revenue write-downs decreases with the profitability of the target (*TrgPM*). Overall, the occurrence of deferred revenue write-down appears to be determined by economic factors and not by compensation incentives of the acquirers' CEOs.

Additionally, I investigate whether these prior results differ when the cash incentive pay is based on non-GAAP metrics that adjust for the target's revenues or ghost revenues. To test this research question, I use equation (3) but include *NG*, and interact *NG* with each of my incentive pay variables. I use the following linear probability model:

$$\begin{aligned}
 \text{Prob}(\textit{Write Down} = 1|X) = & \gamma_0 + \gamma_1(\textit{Bonus}, \textit{NEIP}, \textit{or Bonus/NEIP}) + \gamma_2\textit{NG} + \\
 & + \gamma_3\textit{NG} * (\textit{Bonus}, \textit{NEIP}, \textit{or Bonus/NEIP}) + \gamma_4\textit{CAR} + \gamma_5\textit{TrgPM} + \\
 & \gamma_6\textit{AcqPM} + \gamma_7\textit{PeerPM} + \gamma_8\textit{TrgPublic} + \gamma_9\textit{PctStock} + \gamma_{10}\textit{Relative} + \\
 & \gamma_{11}\textit{Deal Size} + \gamma_{12}\textit{SameInd} + \gamma_{13}\textit{AcqMTB} + \gamma_{14}\textit{Goodwill} + \\
 & \textit{Trg Industry FE} + \textit{Year FE} + \varepsilon
 \end{aligned} \tag{4}$$

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<sup>27</sup> I continue to find insignificant coefficients on my cash incentive pay variables when estimating equation (3) and (4) using a logistic regression with and without fixed effects.

Table 8 presents the results from estimating equation (4) investigating whether the relation between the occurrence of deferred revenue write-downs and the proportion of CEO cash incentive pay differs when the cash incentive pay is based on non-GAAP metrics that adjust for the target's revenues or deferred revenue write-downs. I find that the coefficients on *Bonus*, *NEIP*, and *Bonus/NEIP* are statistically insignificant.<sup>28</sup> Additionally, I find that the coefficients on interactions *Bonus\*NG*, *NEIP\*NG*, and *Bonus/NEIP\*NG* are statistically insignificant. These results suggest that the proportion of CEO cash incentive pay does not impact the occurrence of deferred revenue write-downs even when the incentive pay is based on non-GAAP metrics that either remove the target's revenues or include ghost revenues. Overall, these results suggest that although CEOs may exercise discretion in determining the magnitude of deferred revenue write-downs, their discretion does not extend to avoiding the occurrence of deferred revenue write-downs.

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<sup>28</sup> I continue to find insignificant coefficients on the interactions when estimating equation (4) using a logistic regression with and without fixed effects.

## SECTION VI. SUMMARY AND CONCLUSIONS

In this study, I investigate the impact of CEOs' compensation incentives on the fair value measurement of deferred revenues in acquisitions. If CEOs' cash incentive pay is based on performance metrics tied to post-acquisition GAAP revenue, CEOs have incentives to minimize the magnitude of deferred revenue write-downs in order to maximize the revenue recognized post-acquisition. However, if CEOs' cash incentive pay is based on non-GAAP metrics adjusted for the target's revenues or ghost revenues, CEOs are less likely to benefit from reducing the magnitude of deferred revenue write-down. Therefore, I hypothesize that the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay. Additionally, I hypothesize that the magnitude of deferred revenue write-downs increases with the proportion of CEO cash incentive pay tied to non-GAAP metrics that adjust for the target's revenues or ghost revenues.

Using a hand-collected sample of 334 material acquisitions, I find that 64 percent of sample firms write down deferred revenues to fair value and write down \$0.15 per share on average. I find evidence that the magnitude of deferred revenue write-downs decreases with the proportion of CEO cash incentive pay, consistent with my expectations. Next, I find that the negative relation between deferred revenue write-downs and the proportion of CEO cash incentive pay does not exist when CEO cash incentive pay is tied to non-GAAP performance metrics that adjust for the target's revenues or deferred revenue write-downs. Furthermore, I find a positive relation between deferred revenue write-downs and the proportion of CEO cash incentive pay when cash incentive pay is based on non-GAAP performance metrics that adjust for ghost revenues. In contrast, I find that the occurrence of deferred revenue write-downs does not decrease with the proportion of CEO cash incentive pay. Finally, I find that CEO cash

incentive pay based on non-GAAP metrics that adjust for the target's revenue or ghost revenues does not impact the occurrence of deferred revenue write-downs. Overall, the occurrence of deferred revenue write-downs appears to be determined by economic factors and not by compensation incentives of the acquirers' CEOs.

My study contributes to the literature in several ways. First, I provide distinctive evidence that certain managers have incentives to adjust the fair values of deferred revenues to increase future revenues for the acquirer, which is previously unexplored in the literature. Second, my study contributes to the research on non-GAAP disclosure and compensation by providing evidence that certain non-GAAP compensation performance metrics can impact fair value measurement of deferred revenues in acquisitions. Lastly, I examine a topic of particular interest to practitioners, regulators, and standard setters. I investigate a topic of interest to the FASB given their ongoing project to research the potential alternatives for the recognition and measurement of deferred revenues in business combinations. The FASB recently proposed that the timing of payment of consideration on a contract should not affect the amount of revenue recognized by the acquirer. Under the current standard, an acquirer would recognize more revenues for the same performance obligations if the target's contracts with customers require payments over time rather than full payment in advance of the performance obligations. This suggestion would potentially require more judgment in measuring acquired deferred revenues because managers would need to estimate the value of what the combined entity expects to receive at the time of the acquisition date. To the extent that any new accounting standard increases the judgment involved in determining the fair value of acquirer deferred revenue, I provide evidence suggesting that managers exercise discretion in the fair value measurement of deferred revenue to boost post-acquisition revenues. Additionally, my results should be of

interest to audit professionals and researchers. External auditors are now required to identify critical audit matters (CAMs) in audit reports. These are disclosures by auditors that identify material accounts or disclosures that involve especially challenging, complex, or subjective judgment during the audit engagement. In 2019, the most common CAM subjects were “Business Combinations” and “Revenues from customer contracts” (Burke, Hoitash, Hoitash, and Xiao 2020). My study examines an issue at the intersection of these important subject areas. I provide evidence suggesting that auditors should consider managers’ incentives to minimize deferred revenue write-downs and acknowledge the potentially subjective judgment involved in estimating deferred revenue fair values. Overall, the results of my study provide information of particular interest to practitioners, regulators, and standard setters who, when developing and implementing the standards surrounding deferred revenue valuation in acquisitions, must consider managers' incentives to minimize deferred revenue write-downs.

## REFERENCES

Altamuro, J., A. L. Beatty, and J. Weber. 2005. The effects of accelerated revenue recognition on earnings management and earnings informativeness: Evidence from SEC Staff Accounting Bulletin No. 101. *The Accounting Review* 80 (2): 373–401.

Ashby, J., J. A. Chyz, L. A. Myers, and B. Whipple. 2020. The impact of non-GAAP disclosure on the purchase price allocation to definite-lived intangible assets in mergers and acquisitions. Working paper, The University of Tennessee and University of Georgia.

Barth, M. E. 1994. Fair value accounting: Evidence from investment securities and the market valuation of banks. *The Accounting Review* 69 (1): 1–25.

\_\_\_\_\_, W. H. Beaver, and W. R. Landsman. 1996. Value-relevance of banks' fair value disclosures under SFAS No. 107. *The Accounting Review* 71 (4): 513–537.

Beatty A., and J. Weber. 2006. Accounting discretion in fair value estimates: An examination of SFAS 142 goodwill impairments. *Journal of Accounting Research* 44 (2): 257–288.

Black, D., E. Black, T. Christensen, and K. Gee. 2020. The Use of Non-GAAP EPS for Compensation Contracting and Financial Reporting, Working paper, University of Nebraska-Lincoln, University of Oklahoma, University of Georgia, and Pennsylvania State University. Available at: <http://ssrn.com/abstract=2343140>

Blankespoor, E., T. J. Linsmeier, K. R. Petroni, and C. Shakespeare. 2013. Fair value accounting for financial instruments: Does it improve the association between bank leverage and credit risk? *The Accounting Review* 88 (4): 1143–1177.

Blann, J., J. L. Campbell, J. E. Shipman, and Z. Wiebe. 2020. Evidence on the Decision Usefulness of Fair Values in Business Combinations. Working paper, University of Arkansas and University of Georgia. Available at: <https://ssrn.com/abstract=3568820>

Bugeja, M., and A. Loyeung. 2015. What drives the allocation of the purchase price to goodwill? *Journal of Contemporary Accounting and Economics* 11 (3): 245–261.

Burke, J., R. Hoitash, U. Hoitash, and X. Xiao. 2020. An Investigation of US Critical Audit Matter Disclosures. Working paper, University of Colorado at Denver, Bentley University, and Northeastern University. Available at <https://ssrn.com/abstract=3635477>

Cadman, B., M. E. Carter, and S. Hillegeist. 2010. The incentives of compensation consultants and CEO pay. *Journal of Accounting and Economics* 49 (3): 263–280.

Campbell, J. L., K. H. Gee, and Z. Wiebe. 2020. The Determinants and Informativeness of Non-GAAP Revenue Disclosures. Working paper, University of Georgia, Pennsylvania State University, and University of Arkansas. Available at: <https://ssrn.com/abstract=3564204>

Caylor, M. L. 2010. Strategic revenue recognition to achieve earnings benchmarks. *Journal of Accounting and Public Policy* 29 (1): 82–95.

- Chen, C. W. 2019. The disciplinary role of financial statements: evidence from mergers and acquisitions of privately held targets. *Journal of Accounting Research* 57 (2): 391-430.
- Core, J. E., W. R. Guay, and R. E. Verrecchia. 2003. Price versus non-price performance measures in optimal CEO compensation contracts. *The Accounting Review* 78 (4): 957-981.
- Dechow, P. M., L. A. Myers, and C. Shakespeare. 2010. Fair value accounting and gains from asset securitizations: A convenient earnings management tool with compensation side-benefits. *Journal of Accounting and Economics* 49 (1-2): 2-25.
- Dickinson, V., D. D. Wangerin, and J. J. Wild. 2016. Accounting rules and post-acquisition profitability in business combinations. *Accounting Horizons* 30 (4): 427-447.
- Dietrich, J. R., M. S. Harris, and K. A. Muller III. 2000. The reliability of investment property fair value estimates. *Journal of Accounting and Economics* 30 (2): 125-158.
- Eccher, E. A., K. Ramesh, and S. R. Thiagarajan. 1996. Fair value disclosures by bank holding companies. *Journal of Accounting and Economics* 22 (1-3): 79-117.
- Fontes, J. C., A. Panaretou, and K. V. Peasnell. 2018. The impact of fair value measurement for bank assets on information asymmetry and the moderating effect of own credit risk gains and losses. *The Accounting Review* 93 (6): 127-147.
- Guest, N. M., S. P. Kothari, and R. Pozen. 2020. High non-GAAP earnings predict abnormally high CEO pay. Working paper, Cornell University and Massachusetts Institute of Technology. Available at: <https://ssrn.com/abstract=3030953>
- King, Z., T. Linsmeier, and D. Wangerin. 2019. Differences in the value relevance of identifiable intangible assets acquired in business combinations. Working paper, University of Wisconsin – Madison. Available at: <https://ssrn.com/abstract=3438250>
- Larcker, D. F., S. A. Richardson, and I. R. Tuna. 2007. Corporate governance, accounting outcomes, and organizational performance. *The Accounting Review* 82 (4): 963-1008.
- Leone, A. J., M. Minutti-Meza, and C. E. Wasley. 2019. Influential observations and inference in accounting research. *The Accounting Review* 94 (6): 337-364.
- Li, K. K., and R. G. Sloan. 2017. Has goodwill accounting gone bad? *Review of Accounting Studies* 22 (2): 964-1003.
- Lynch, D., M. Romney, B. Stomberg, and D. Wangerin. 2019. Trade-offs between tax and financial reporting benefits: Evidence from purchase price allocations in taxable acquisitions. *Contemporary Accounting Research* 36 (3): 1223-1262.

- Magnan, M., A. Menini, and A. Parbonetti. 2015. Fair value accounting: information or confusion for financial markets? *Review of Accounting Studies* 20 (1): 559–591.
- McInnis, J. M., and B. Monsen. 2020. The operating returns to acquired intangible assets. Working paper, The University of Texas at Austin and The Ohio State University. Available at: <https://ssrn.com/abstract=3279123>
- Murphy, K. J. 1999. Executive compensation. *Handbook of Labor Economics* 3: 2485–2563.
- Murphy, K. J. 2013. Executive compensation: Where we are, and how we got there. *Handbook of the Economics of Finance* 2: 211–356.
- Myers, L. A., R. Schmardebeck, T. A. Seidel, and M. D. Stuart. 2020. The Impact of Increased Managerial Discretion on the Usefulness of Reported Revenues: Evidence from Accounting Standard Updates for Multiple-Deliverable Sales Arrangements. Working paper, The University of Tennessee, Brigham Young University, and Vanderbilt University. Available at: <https://ssrn.com/abstract=2559438>
- Nelson, K. K. 1996. Fair value accounting for commercial banks: An empirical analysis of SFAS No. 107. *The Accounting Review* 71 (2): 161–182.
- Paugam, L., P. Astolfi, and O. Ramond. 2015. Accounting for business combinations: Do purchase price allocations matter? *Journal of Accounting and Public Policy* 34 (4): 362–391.
- Prakash, R., and N. Sinha. 2013. Deferred revenues and the matching of revenues and expenses. *Contemporary Accounting Research* 30 (2): 517–548.
- Ramanna, K., and R. Watts. 2012. Evidence on the use of unverifiable estimates in required goodwill impairment. *Review of Accounting Studies* 17 (4): 749–780.
- Shalev, R. 2009. The information content of business combination disclosure level. *The Accounting Review* 84 (1): 239–270.
- \_\_\_\_\_, I. Zhang, and Y. Zhang. 2013. CEO compensation and fair value accounting: Evidence from purchase price allocation. *Journal of Accounting Research* 51 (4): 819–854.
- Song, C. J., W. B. Thomas, and H. Yi. 2010. Value relevance of FAS No. 157 fair value hierarchy information and the impact of corporate governance mechanisms. *The Accounting Review* 85 (4): 1375–1410.
- Srivastava, A. 2014. Selling-price estimates in revenue recognition and the usefulness of financial statements. *Review of Accounting Studies* 19 (2): 661–697.
- Zhang, I. X., and Y. Zhang. 2017. Accounting discretion and purchase price allocation after acquisitions. *Journal of Accounting, Auditing & Finance* 32 (2): 241–270.

## APPENDICES

## Appendix A

### Variable Descriptions

<i>Deal Value</i>	Deal value of the target reported in the 8-K/A or S-4 in millions
<i>Deferred Revenue Book Value</i>	Deferred revenue book value from the companies 8-K/A or S-4 in millions
<i>Deferred Revenue Fair Value</i>	Deferred revenue fair value from the companies 8-K/A or S-4 in millions
<i>Deferred Revenue Write-Down</i>	Deferred revenue write-down from the companies 8-K/A or S-4 in millions
<i>Def Rev Fair Value Percent</i>	Deferred revenue fair value scaled by the deferred revenue book value
<i>Def Rev Write-Down Percent</i>	Deferred revenue write-down scaled by the Deferred Revenue Book-Value
<i>Def Rev (Book)</i>	Deferred revenue book value scaled by the target's deal value
<i>Def Rev Write-Down</i>	Deferred revenue write-down scaled by the target's deal value
<i>Write-Down</i>	Indicator variable equal to 1 if target's deferred revenue is written down, and 0 otherwise
<i>Write-Down Per Share</i>	Target's deferred revenue write-down scaled by the acquirer's common shares (cshfd) at the end of the acquisition year
<i>Bonus</i>	Acquirer CEO's bonus compensation scaled by the acquirer CEO's total compensation in the year of the acquisition
<i>NEIP</i>	Acquirer CEO's non-equity incentive pay compensation scaled by the acquirer CEO's total compensation in the year of the acquisition
<i>Bonus/NEIP</i>	Sum of the acquirer CEO's non-equity incentive pay compensation and acquirer CEO's bonus compensation scaled by the acquirer CEO's total compensation in the year of the acquisition
<i>CAR</i>	Three-day cumulative abnormal return around the acquisition announcement; the abnormal return is computed using the market model, where the parameters of the model are estimated over the window (271,21) trading days preceding the acquisition announcement and the market return is measured as the return to the CRSP equally weighted index
<i>TrgPM</i>	Target's operating earnings scaled by sales for the last fiscal year period reported in the target's 8-K/A or S-4 or Compustat
<i>AcqPM</i>	Acquirer's operating earnings scaled by sales
<i>PeerPM</i>	Median operating earnings scaled by sales for public firms in the target's 2-digit SIC code industry

<i>TrgPublic</i>	Indicator variable equal to 1 if the target is a public firm, and 0 otherwise
<i>PctStock</i>	Percentage of consideration paid for the target consisting of stock
<i>Relative</i>	Acquirer's pre-acquisition total assets scaled by the target's deal value
<i>DealSize</i>	Log of the target's deal value
<i>SameInd</i>	Indicator variable equal to 1 if the acquirer and target share the same 2-digit SIC code, and 0 otherwise
<i>AcqMTB</i>	Acquirer's pre-acquisition market to book ratio.
<i>Goodwill</i>	Target's goodwill scaled by the target's deal value reported in the target's 8-K/A or S-4
<i>NG</i>	Indicator variable equal to 1 if the CEO's compensation is tied to a non-GAAP metric (non-GAAP revenue, non-GAAP earnings, etc.) that doesn't include the impact of revenues from the target or the deferred revenue write-downs, and 0 otherwise
<i>NG Def Rev</i>	Indicator variable equal to 1 if the CEO's compensation is tied to a non-GAAP metric (non-GAAP revenue, non-GAAP earnings, etc.) that adjusts for the deferred revenue write-downs, and 0 otherwise
<i>NG Organic</i>	Indicator variable equal to 1 if the CEO's compensation is tied to a non-GAAP metric (non-GAAP revenue, non-GAAP earnings, etc.) that doesn't include the impact of revenues from the target, and 0 otherwise

**Appendix B  
Tables**

**Table 1  
Sample Selection**

	Number of Deals
Number of material deals in SDC between January 2003 to December 2018 where the acquirer has a deferred revenue balance post-acquisition (or where public targets have a deferred revenue balance pre-acquisition)	810
No 8-K/A or S-4, no pro forma balance sheet, or no deferred revenue balance reported	(412)
Deals with deferred revenue write-ups	(5)
Deals with missing Compustat data	(13)
Deals with no CEO compensation data (missing DEF 14A and EXECUCOMP data)	(19)
Deals with no announcement return data	(27)
Final Sample	334

**Table 2**  
**Descriptive Statistics**

VARIABLES (N =334)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	mean	Std dev.	p1	p25	p50	p75	p99
<i>Deal Value</i>	780.7	2,001	2.704	39.47	186.0	538.1	13,041
<i>Deferred Revenue Book Value</i>	41.93	141.6	0.039	1.373	6.059	25.30	601.3
<i>Deferred Revenue Fair Value</i>	26.30	98.96	0.000	0.418	2.797	14.56	271
<i>Deferred Revenue Write-Down</i>	15.68	62.30	0.000	0.000	1.002	7.235	354.5
<i>Def Rev Fair Value Percent</i>	0.678	0.346	0.000	0.429	0.777	1.000	1.000
<i>Def Rev Write-Down Percent</i>	0.324	0.344	0.000	0.000	0.223	0.571	1.000
<i>Write-Down Per Share</i>	0.156	0.445	0.000	0.000	0.019	0.130	2.521
<i>Write-Down</i>	0.644	0.480	0.000	0.000	1.000	1.000	1.000
<i>Def Rev Write-Down</i>	0.037	0.087	0.000	0.000	0.007	0.029	0.612
<i>Bonus</i>	0.0785	0.147	0.000	0.000	0.000	0.0948	0.624
<i>NEIP</i>	0.111	0.146	0.000	0.000	0.000	0.195	0.631
<i>Bonus/NEIP</i>	0.190	0.166	0.000	0.0601	0.161	0.269	0.684
<i>Def Rev (Book)</i>	0.102	0.167	0.000	0.0119	0.0414	0.114	0.989
<i>CAR</i>	0.0109	0.126	-0.273	-0.040	0.00457	0.0628	0.420
<i>TrgPM</i>	-0.455	1.952	-13.11	-0.126	0.0284	0.122	0.352
<i>AcqPM</i>	0.0236	0.365	-2.788	-0.004	0.0768	0.159	0.402
<i>PeerPM</i>	0.0104	0.0788	-0.343	0.007	0.0318	0.0496	0.103
<i>TrgPublic</i>	0.347	0.477	0.000	0.000	0.000	1.000	1.000
<i>PctStock</i>	0.224	0.329	0.000	0.000	0.000	0.398	1.000
<i>Relative</i>	3.378	3.951	0.204	1.585	2.799	3.810	31.10
<i>DealSize</i>	5.046	1.857	0.995	3.675	5.226	6.288	9.476
<i>SameInd</i>	0.707	0.456	0.000	0.000	1.000	1.000	1.000
<i>AcqMTB</i>	4.370	5.925	-3.792	1.905	3.130	4.989	49.60
<i>Goodwill</i>	0.544	0.253	0.000	0.380	0.538	0.725	1.272

This panel presents the descriptive statistics for the sample. I winsorize all continuous variables that are included in the regressions at the 1st and 99th percentile. All variables are defined in the Appendix

**Table 3**  
**Univariate Analysis**

<i>Partitioning Variable = Write-Down</i>			
VARIABLES	<i>Write-Down = 0</i>	<i>Write-Down = 1</i>	Difference
	(N=119) mean	(N=215) mean	
<i>Bonus</i>	0.113	0.059	0.054***
<i>NEIP</i>	0.090	0.122	-0.032**
<i>Bonus/NEIP</i>	0.204	0.182	0.022
<i>Def Rev (Book)</i>	0.057	0.127	-0.07***
<i>CAR</i>	0.015	0.009	0.006
<i>TrgPM</i>	-0.385	-0.494	0.109
<i>AcqPM</i>	-0.019	0.047	-0.066*
<i>PeerPM</i>	-0.010	0.021	-0.031***
<i>TrgPublic</i>	0.294	0.377	-0.083*
<i>PctStock</i>	0.257	0.205	0.052*
<i>Relative</i>	3.115	3.524	-0.409
<i>DealSize</i>	4.584	5.302	-0.718***
<i>SameInd</i>	0.647	0.740	-0.093**
<i>AcqMTB</i>	3.496	4.854	-1.358***
<i>Goodwill</i>	0.560	0.535	0.025
<i>NG</i>	0.059	0.112	-0.053**

This panel presents descriptive statistics for each of the independent variables for the sample. I separate the observations based on *Write Down*. \*, \*\*, and \*\*\* indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on one-tailed tests) using a t-test of difference in means. All variables are defined in the Appendix.

**Table 4**  
**Incentive Pay and Deferred Revenue Write-Down Magnitude**

VARIABLES	Prediction	(1) <i>Def Rev Write-Down</i>	(2) <i>Def Rev Write-Down</i>	(3) <i>Def Rev Write-Down</i>
<i>Bonus</i>	-	-0.021** (0.031)		
<i>NEIP</i>	-		-0.017* (0.059)	
<i>Bonus/NEIP</i>	-			-0.024** (0.026)
<i>Def Rev (Book)</i>		0.393*** (0.000)	0.394*** (0.000)	0.392*** (0.000)
<i>CAR</i>		-0.035 (0.260)	-0.035 (0.271)	-0.035 (0.256)
<i>TrgPM</i>		-0.001 (0.449)	-0.001 (0.431)	-0.001 (0.449)
<i>AcqPM</i>		-0.017 (0.224)	-0.018 (0.202)	-0.017 (0.206)
<i>PeerPM</i>		-0.041 (0.635)	-0.052 (0.555)	-0.045 (0.616)
<i>TrgPublic</i>		-0.003 (0.785)	-0.003 (0.769)	-0.003 (0.777)
<i>PctStock</i>		-0.003 (0.822)	-0.004 (0.783)	-0.004 (0.790)
<i>DealSize</i>		0.004** (0.029)	0.005** (0.012)	0.005** (0.016)
<i>Relative</i>		0.000 (0.379)	0.000 (0.358)	0.000 (0.372)
<i>SameInd</i>		-0.009* (0.057)	-0.010** (0.047)	-0.009* (0.054)
<i>AcqMTB</i>		0.000 (0.682)	0.000 (0.830)	0.000 (0.850)
<i>Goodwill</i>		-0.063*** (0.003)	-0.065*** (0.003)	-0.062*** (0.004)
Constant		0.012 (0.663)	0.005 (0.849)	0.010 (0.725)
Observations		334	334	334
Adjusted R-squared		0.523	0.522	0.524
Trg. Industry & Year FE		YES	YES	YES

This table presents the results of the fixed effect regression analysis. The dependent variable in each column is *Def Rev Write-Down*. The variables of interest in this table are *Bonus*, *NEIP*, and *Bonus/NEIP*. All variables are defined in the Appendix. Cluster (by target industry) robust p-values

are presented below the coefficient. \*, \*\*, and \*\*\* indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on one-tailed tests for variables of interest, and two-tailed tests for controls).

**Table 5**  
**Non-GAAP Incentive Pay Metrics and Deferred Revenue Write-Down Magnitude**

VARIABLES	Prediction	(1) <i>Def Rev Write- Down</i>	(2) <i>Def Rev Write- Down</i>	(3) <i>Def Rev Write- Down</i>
<i>Bonus</i>	-	-0.020** (0.032)		
<i>NEIP</i>	-		-0.023* (0.060)	
<i>Bonus/NEIP</i>	-			-0.028** (0.027)
<i>NG</i>		0.001 (0.765)	-0.006 (0.268)	-0.009 (0.143)
<i>Bonus*NG</i>	+	0.005 (0.473)		
<i>NEIP*NG</i>	+		0.053* (0.051)	
<i>Bonus/NEIP*NG</i>	+			0.061** (0.030)
F-Test B1+B3 =0		.06	2.20	2.56
P-value		.8137	.1506	.1219
Observations		334	334	334
Adjusted R-squared		0.520	0.520	0.522
Controls		YES	YES	YES
Trg. Industry & Year FE		YES	YES	YES

This table presents the results of the fixed effect regression analysis. The dependent variable in columns (1) – (3) is *Def Rev Write-Down*. The variables of interest in this table are *Bonus*, *NEIP*, *Bonus/NEIP*, *Bonus\*NG*, *NEIP\*NG*, and *Bonus/NEIP\*NG*. All variables are defined in the Appendix. Cluster (by target industry) robust p-values are presented below the coefficient. \*, \*\*, and \*\*\* indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on one-tailed tests for variables of interest, and two-tailed tests for controls).

**Table 6**  
**Non-GAAP Adjustments and Deferred Revenue Write-Down Magnitude**

VARIABLES	Prediction	(1) <i>Def Rev</i> <i>Write-Down</i>	(2) <i>Def Rev</i> <i>Write-Down</i>	(3) <i>Def Rev</i> <i>Write-Down</i>	(4) <i>Def Rev</i> <i>Write-Down</i>	(5) <i>Def Rev</i> <i>Write-Down</i>	(6) <i>Def Rev</i> <i>Write-Down</i>
<i>Bonus</i>	-	-0.021** (0.030)			-0.019** (0.038)		
<i>NEIP</i>	-		-0.016* (0.090)			-0.025** (0.038)	
<i>Bonus/NEIP</i>	-			-0.024** (0.031)			-0.028** (0.022)
<i>NG Organic</i>		-0.009 (0.242)	0.002 (0.808)	-0.002 (0.886)			
<i>NG Def Rev</i>					0.009** (0.032)	-0.007* (0.056)	-0.009** (0.035)
<i>Bonus*NG Organic</i>	+	0.156 (0.161)					
<i>NEIP*NG Organic</i>	+		-0.049 (0.905)				
<i>Bonus/NEIP* NG Organic</i>	+			-0.029 (0.736)			
<i>Bonus*NG Def Rev</i>	+				-0.080 (0.902)		
<i>NEIP*NG Def Rev</i>	+					0.093*** (0.001)	
<i>Bonus/NEIP* NG Def Rev</i>	+						0.092*** (0.001)
F-Test B1+B3 =0		.76	4.84	1.91	2.87	8.93	8.26
P-value		.3927	.0373	.1795	.1026	.0062	.0082
Observations		334	334	334	334	334	334
Adjusted R-squared		0.520	0.520	0.521	0.520	0.521	0.522
Controls		YES	YES	YES	YES	YES	YES
Trg. Industry & Year FE		YES	YES	YES	YES	YES	YES

This table presents the results of the fixed effect regression analysis. The dependent variable in each column is *Def Rev Write-Down*. The variables of interest in this table are *Bonus*, *NEIP*, *Bonus/NEIP*, *Bonus\*NG Organic*, *NEIP \*NG Organic*, *Bonus/NEIP\*NG Organic*, *Bonus\*NG Def Rev*, *NEIP\*NG Def Rev*, and *Bonus/NEIP\*NG Def Rev*. All variables are defined in the Appendix. Cluster (by target industry) robust p-values are presented below the coefficient. \*, \*\*, and \*\*\* indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on one-tailed tests for variables of interest, and two-tailed tests for controls).

**Table 7**  
**Incentive Pay and Deferred Revenue Write-Down Occurrence**

VARIABLES	Prediction	(1) <i>Write-Down</i>	(2) <i>Write-Down</i>	(3) <i>Write-Down</i>
<i>Bonus</i>	-	-0.056 (0.404)		
<i>NEIP</i>	-		-0.009 (0.468)	
<i>Bonus/NEIP</i>	-			-0.046 (0.376)
<i>Def Rev (Book)</i>		0.757*** (0.000)	0.762*** (0.000)	0.757*** (0.000)
<i>CAR</i>		-0.293 (0.233)	-0.293 (0.232)	-0.293 (0.229)
<i>TrgPM</i>		-0.019*** (0.000)	-0.019*** (0.000)	-0.019*** (0.000)
<i>AcqPM</i>		-0.019 (0.808)	-0.022 (0.775)	-0.019 (0.805)
<i>PeerPM</i>		0.421 (0.204)	0.400 (0.192)	0.409 (0.187)
<i>TrgPublic</i>		-0.091 (0.118)	-0.091 (0.125)	-0.091 (0.122)
<i>PctStock</i>		0.123** (0.020)	0.122** (0.021)	0.121** (0.028)
<i>Relative</i>		0.008** (0.049)	0.008** (0.050)	0.008* (0.054)
<i>DealSize</i>		0.096*** (0.000)	0.097*** (0.000)	0.097*** (0.000)
<i>SameInd</i>		0.020 (0.847)	0.019 (0.850)	0.020 (0.847)
<i>AcqMTB</i>		0.004** (0.031)	0.004** (0.037)	0.004** (0.027)
<i>Goodwill</i>		-0.310*** (0.005)	-0.316*** (0.001)	-0.310*** (0.003)
Constant		0.067 (0.506)	0.055 (0.642)	0.060 (0.586)
Observations		334	334	334
Adj. R-squared		0.184	0.184	0.185
Trg. Industry & Year FE		YES	YES	YES

This table presents the results of the linear probability regression analysis. The dependent variable in each column is *Write Down*. The variables of interest in this table are *Bonus*, *NEIP*, and *Bonus/NEIP*. All variables are defined in the Appendix. Cluster (by target industry) robust p-values are presented below the coefficient. \*, \*\*, and \*\*\* indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on one-tailed tests for variables of interest, and two-tailed tests for controls).

**Table 8**  
**Non-GAAP Incentive Pay Metrics and Deferred Revenue Write-Down Occurrence**

VARIABLES	Prediction	(1) <i>Write-Down</i>	(2) <i>Write-Down</i>	(3) <i>Write-Down</i>
<i>Bonus</i>	-	-0.062 (0.392)		
<i>NEIP</i>	-		0.110 (0.122)	
<i>Bonus/NEIP</i>	-			0.023 (0.445)
<i>NG</i>		-0.019 (0.752)	0.173** (0.026)	0.190 (0.131)
<i>Bonus*NG</i>	+	0.522 (0.180)		
<i>NEIP*NG</i>	+		-1.134 (0.992)	
<i>Bonus/NEIP *NG</i>	+			-1.109 (0.958)
Observations		334	334	334
Adjusted R-squared		0.179	0.189	0.189
Controls		YES	YES	YES
Trg. Industry & Year FE		YES	YES	YES

This table presents the results of the fixed effect regression analysis. The dependent variable in columns (1) – (3) is *Write-Down*. The variables of interest in this table are *Bonus*, *NEIP*, *Bonus/NEIP*, *Bonus\*NG*, *NEIP\*NG*, and *Bonus/NEIP\*NG*. All variables are defined in the Appendix. Cluster (by target industry) robust p-values are presented below the coefficient. \*, \*\*, and \*\*\* indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on one-tailed tests for variables of interest, and two-tailed tests for controls).

## VITA

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