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What is This?

Goodwill Impairment Losses and CEO Compensation

Masako N. Darrough[1], Lale Guler[2], and Ping Wang[3]

Abstract

Corporate acquisitions are arguably one of the most important and biggest decisions CEOs have to make; yet many acquisitions do not create value for shareholders. We examine whether CEO compensation is reduced when the fair values of the acquired business units are written down (i.e., goodwill impairment losses are recognized). We find that there is a significant reduction in cash- and option-based CEO compensation as firms recognize goodwill impairment losses. In particular, we find that the decrease in CEO option-based compensation is driven by firms that are not R&D intensive, while the decrease in CEO cash compensation is driven by firms that acquired larger targets in the recent past and have CEOs with a shorter tenure. Our results suggest that compensation committees make CEOs pay a price for non-value maximizing acquisitions and discourage them from further undertaking risky investments especially by reducing the risk-inducing component of their compensation packages.

Keywords

CEO compensation, goodwill impairment, mergers and acquisitions, cash compensation, option compensation

Introduction

Compensation committees, charged with designing executive compensation policies, have discretion as to how to evaluate executives' performance. In particular, these committees decide whether and how to modify accounting income in determining executive compensation. Companies also award discretionary bonuses (e.g., for completion of M&A transactions), which are usually not specified in the proxy statements. While some companies specifically disclose exactly how their executives' compensation depends on financial metrics such as earnings targets and *ROA*, which often exclude special items, including

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goodwill impairments, others are silent about how they assess executives' performance in the presence of such special items. Given that most companies do not provide explicit disclosures about how the compensation committees treat special items in their evaluation of executives' performance, an empirical investigation is called for. In this article, we investigate how one particular special item affects executive compensation: goodwill impairment.

Goodwill impairments are recognized when a reduction in the fair value of the acquired business units occurs. Compensation committees may exclude or include goodwill impairment charges in earnings calculation for determining CEO compensation. There are at least four reasons why compensation committees might shield CEOs from goodwill impairment losses.[1] First, impairments may arise as a result of conditions that are beyond current executives' control. Prior research finds that impairments are associated with an array of economic and other factors (Beatty & Weber, 2006; Francis, Hanna, & Vincent, 1996; Riedl, 2004). Goodwill impairments can also result from poor acquisition decisions in the past (Gu & Lev, 2011; Hayn & Hughes, 2006; Olante, 2013), and thus the CEOs who are taking goodwill impairments may not even be the CEOs who actually made the acquisition decisions. Second, even though a CEO was responsible for the acquisitions that require goodwill impairments, compensation committees might be reluctant to penalize the CEO for the past decisions. All investments, particularly acquisitions, are risky *ex ante*, and some acquisitions will turn out unsuccessful. Because executives are likely to be more risk-averse than shareholders, compensation committees may choose to shield them from the downside of risk taking so that executives would continue to pursue risky, but potentially value enhancing, acquisitions in the future. Thus, compensation committees, attempting to prevent the possibility of underinvestment, might shield executives from the adverse impact of goodwill impairment losses. Third, even though compensation committees might be inclined to include goodwill impairment in defining earnings for compensation calculation, executives might persuade compensation committees to shield them from impairment losses. For example, executives might be able to take advantage of their bargaining position to negotiate favorable compensation contracts that exclude impairment losses. After all, they have firm-specific knowledge and experience that could be viewed as indispensable to the firm. Executives might also take advantage of the complexity and inherent subjectivity associated with goodwill impairment testing under Statement of Financial Accounting Standards (SFAS) 142 (Beatty & Weber, 2006; Muller, Neamtiu, & Riedl, 2012; Ramanna & Watts, 2012), and argue that impairment losses are merely paper losses.[2] Last, poor acquisitions are likely to be recognized by the market and reflected in negative returns and substantial reductions in CEO wealth. Thus, compensation committees might argue that CEOs are already penalized sufficiently by the market and therefore should be shielded from further adverse consequences.

Yet, others might argue that the penalty imposed by the market may not be enough and compensation committees should intervene and not shield CEOs from goodwill impairment losses. Such an argument is warranted in view of the extant research showing that CEOs' desire for empire building often results in acquisitions that are not in the best interest of the shareholders. As noted earlier, empirical evidence suggests that goodwill impairments reflect not only poor performance in earlier M&A decisions (Gu & Lev, 2011; Hayn & Hughes, 2006; Olante, 2013) but also poor management of the acquired assets subsequent to the acquisition (Beatty & Weber, 2006; Riedl, 2004). Thus, even if the CEO who is reporting a goodwill impairment is not the acquisition CEO, she or he may be held accountable for impairment, which may be due to poor management of the acquired assets subsequent to the acquisition. Anecdotal evidence also suggests that the financial community
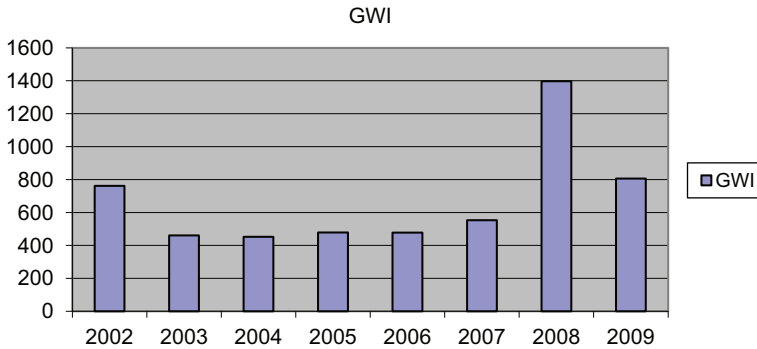
Figure 1. Reported goodwill impairments by year.

takes a negative view of goodwill impairments. For example, in a comment letter dated April 14, 2009, to the Securities and Exchange Commission's (SEC) Financial Crisis Advisory Group, Julie Erhardt of the International Organization of Securities Commissions (IOSCO) states that ''the treatment of goodwill as a recognized asset subject to impairment testing has highlighted the business implications of various prominent acquisitions made during the years of buoyant economic conditions.'' If goodwill impairment results from suboptimal acquisition decisions and/or poor management of the acquired assets subsequent to the acquisition, the compensation committees might penalize CEOs for impairment losses by reducing their compensation so that they make optimal acquisitions in the future. Many CEOs are handsomely rewarded from acquisitions because their bonuses and future salary increase with enlarged firm size and total income. CEOs who acquire large targets also increase the likelihood of receiving offers to sit on the boards of other companies (Harford & Schonlau, 2013). Impairments might signal that CEOs performance has been less than stellar. Given these opposing forces that argue for and against holding CEOs accountable for goodwill impairment losses, how goodwill impairments affect executive compensation ultimately becomes an empirical question.

Our research question is important for several reasons. First, mergers and acquisitions are one of the largest investments made by firms, with CEOs often rewarded for completing M&A deals (Bliss & Rosen, 2001; Grinstein & Hribar, 2004; Harford & Li, 2007; Hartzell, Ofek, & Yermack, 2004), yet empirical evidence shows that many mergers are not value enhancing (Agrawal, Jaffe, & Mandelker, 1992; Jensen & Ruback, 1983; Loughran & Vijh, 1997; Lys & Vincent, 1995; Moeller, Schlingemann, & Stulz, 2005). In addition, concern over excessive CEO compensation and its apparent lack of correlation with performance has recently intensified (Bebchuk & Fried, 2004; Yermack, 2006). Thus, given the widespread agency issues surrounding M&As, the question of whether the executives' performance in acquisitions influences compensation policies is of interest to regulators, standard setters, and the investing community.

Second, the frequency of goodwill impairments has drastically increased recently. For example, almost 1,400 COMPUSTAT U.S. firms reported goodwill impairment losses in 2008, which approximately triples 2007 figure of 553 (Figure 1). Furthermore, reported goodwill impairment amounts are economically significant; mean goodwill impairment as a percentage of prior year earnings is 160% in 2008, up sharply from 14% a year earlier.

Thus, goodwill impairment losses have become economically significant events over time, especially in the wake of the financial crisis of 2008.

Figure 1 represents the number of firms reporting goodwill impairments based on COMPUSTAT universe.

Using a sample of 3,543 firm-year observations consisting of U.S. firms that reported at least one goodwill impairment charge during the years 2002-2009, we estimate how major components of CEO compensation are affected by goodwill impairment losses after controlling for the other determinants of CEO compensation. Because a CEO's compensation is mostly comprised of cash (salary plus bonus), option-based, and restricted stock compensation (on average, 85% of total compensation), we focus on these three components in separate regression analyses. Our methodological approach is similar to prior work that provides evidence on the relation between CEO compensation and accounting numbers in other contexts such as Dechow, Huson, and Sloan (1994), Gaver and Gaver (1998), Comprix and Muller (2006), as well as Q. Cheng and Farber (2008).

Our empirical tests show that after controlling for other factors, firms reduce CEOs' total compensation following the recognition of goodwill impairment losses. However, we find that, while there is a significant reduction in cash- and option-based compensation, restricted stock grants do not significantly change as firms recognize goodwill impairment losses. Because option-based compensation is more efficient than restricted stock to encourage risky investments in the long term (Bryan, Hwang, & Lilien, 2000), we interpret our results as indicating that compensation committees respond to goodwill impairment losses by reducing the risk-inducing component of CEO compensation. Our results are robust to including controls for a number of variables known to influence cash-based, option-based, or restricted stock compensation, and to conducting other additional tests as described in ''Results'' section.

We also examine if and how the change in CEO compensation in response to goodwill impairment losses varies according to the factors specific to the firm, to the acquisitions, and to the CEOs. These factors include whether (a) the firm is R&D intensive, (b) the CEO has spent more for the recently acquired targets (reflected in higher deal values for the targets in recent acquisitions), and (c) the CEO has longer tenure. We find that compensation committees shield CEOs' *option-based* compensation from goodwill impairment in R&D intensive firms, but not in non-R&D intensive firms. We also find that the decrease in CEOs' *cash* compensation in response to goodwill impairment losses is significantly stronger for firms that have paid more for the targets (compared with those who have paid less for the targets) and have CEOs with shorter tenure (compared with those who have CEOs with longer tenure).

In additional analyses, we further explore if goodwill impairment affects CEO compensation in various contexts. We find that new CEOs (CEOs in their first year of appointment) are treated differently from those with longer tenure. As new CEOs often take a big bath to start their tenure with a clean slate, we expect them to be shielded from the adverse consequent of corporate actions taken prior to their appointment. Our findings are consistent with this expectation. Furthermore, we find that for CEOs who are also chairmen of the boards, their cash compensation is shielded from the negative consequences of goodwill impairment losses, suggesting that they wield more influence over compensation committees. Another noteworthy finding is that total compensation (including compensation other than the three components) is also negatively affected by goodwill impairment, suggesting that CEOs are not given other forms of compensation to make up for the loss in cash and option compensation. Finally, we examine whether our results are based on faulty

inferences. It is possible that we have omitted control variables that bias the coefficient estimate of our main variable of interest. In particular, we examine if pay-for performance sensitivity differs across firms of different characteristics. We do find that pay-performance sensitivity does differ across firms; however, the estimates of our main variable are robust to these specifications.

We make several contributions to the literature. First, our article contributes to the stream of literature that examines the consequences to executives who undertake value-destroying acquisitions. Lehn and Zhao (2006) find that CEOs are ''disciplined'' for poor acquisitions: The turnover of CEOs after M&A is high, especially in the firms that experienced lower acquisition announcement cumulative abnormal returns (CARs) and those with poor post-acquisition stock returns. We complement Lehn and Zhao's analysis in two respects. First, Lehn and Zhao (2006) show that 47% of CEOs who undertake acquisitions are fired within 5 years of the acquisition. Of course, that in turn means that more than half of the CEOs are not fired and could potentially be with the firm for more than 5 years. We complement their study by analyzing the consequence, in terms of the effect on compensation, experienced by those who are retained.[3] Second, unlike Lehn and Zhao (2006) who investigate stock returns, we use impairment of goodwill which is a direct measure of acquisition performance.

Prior literature shows that managers' compensation incentives influence the way they account for acquisitions. For example, Ayers, Lefanowicz, and Robinson (2002) find that managers pay a premium to choose pooling rather than purchase under the pre-SFAS 141 regime because purchase accounting results in higher reported expenses in the post-acquisition period due to the amortization of recognized goodwill. Aboody, Kasznik, and Williams (2000) document that CEOs with earnings-based compensation plans are more likely than others to incur the costs of qualifying for pooling and avoid the earnings penalty associated with the purchase accounting. More recently, Shalev, Zhang, and Zhang (2013) find that in the post-SFAS 141 period, CEOs whose compensation packages rely more on earnings-based bonuses are more likely to overallocate the purchase price to goodwill because the overallocation likely increases post-acquisition earnings and bonuses. We complement and extend this stream of literature by showing that compensation committee members do not always sit in silence; while they allow CEOs discretion to allocate purchase prices at the time of acquisition, they eventually step in and reduce the compensation of the CEOs who end up impairing goodwill later on.[4]

We also contribute to the empirical literature that examines the relation between CEO compensation and special charges. While prior studies provide evidence, albeit often mixed, on the impact of special charges such as restructuring costs on CEO cash compensation, they are silent on the effect of goodwill impairment losses on CEO compensation. For instance, Dechow et al. (1994) show that, on average, compensation committees shield CEO cash compensation from restructuring charges. Adut, Cready, and Lopez (2003), however, find that compensation committees only partially shield CEO cash compensation from the adverse effect of restructuring charges on earnings. Restructuring charges and goodwill impairment losses are similar in the sense that they are both non-routine charges reducing net income; however, they are fundamentally different in nature. Restructuring charges arise when a company reorganizes its operations with the prospect of attaining greater efficiency. Restructuring charges also require cash outflows. In contrast, goodwill impairment charges represent a subsequent reduction in the economic value of goodwill arising from past acquisitions, and do not involve any cash outflows. Therefore, the findings of restructuring literature do not necessarily apply to goodwill impairments.

Last, our article contributes to the literature that examines the relation between CEO compensation and accounting choice. For example, Beatty and Weber (2006) examine accounting choices that managers made during the transition to SFAS 142: whether to record a goodwill impairment loss at the time of adoption of the standard and record them as a below-the line-item, or to delay the recognition of impairment losses to the future and record them as above-the-line item. They document that if the firm's proxy statement reveals a bonus plan that relies on earnings, then transitional goodwill impairment charges are less likely to be recorded and tend to be lower in magnitude. Taken together, the evidence in Beatty and Weber (2006) implies that managers act *as if* compensation committees incorporate adverse effects of asset write-downs or goodwill impairment charges in compensation formulas; however, unlike our study, the article does not directly test whether the compensation committees in fact incorporate the adverse effects of goodwill impairment losses into determination of CEOs' compensation.

The rest of this article is organized as follows: ''Accounting for Goodwill Impairment Losses Under SFAS 142'' section describes the institutional background, while ''Hypotheses Development'' section presents the hypothesis development. ''Research Design'' section describes the research design and ''Results'' section presents the results of our empirical analyses. ''Concluding Remarks'' section presents the conclusion.

Accounting for Goodwill Impairment Losses Under SFAS 142

The central objective of SFAS 142 (Financial Accounting Standards Board [FASB], 2001) is that financial statements reflect the underlying economic value of goodwill. SFAS 142 eliminates the amortization of goodwill and requires testing of impairment at least annually at the reporting unit level.[5] To test goodwill for impairment, managers must first define ''reporting units'' and then assign the recorded goodwill to reporting units. Companies assign goodwill to each reporting unit by comparing the estimated ''fair value'' of the reporting unit as a whole with the fair values of the reporting unit's identifiable net assets.

Under SFAS 142, the impairment test is carried out in two steps. In Step 1, a reporting unit's carrying amount is compared with its fair value. In Step 2, the company estimates the *implied* fair value of the reporting unit's goodwill by subtracting estimated fair values of the reporting unit's identifiable net assets from the reporting unit's estimated fair value. While SFAS 142 forces managers to perform a goodwill impairment test every year, it also provides them with several critical accounting choices; the definition of reporting units and the assessment of fair values, both at the level of reporting unit as a whole and at the level of net assets that comprises the reporting unit. Consequently, as Massoud and Raiborn (2003) argue, managers can be selective with respect to the definitions of reporting units as well as the assumptions used in fair-value calculations in the impairment testing process. Thus, SFAS 142 provides managers with significant accounting discretion with respect to the probability, timing, and the amount of loss recognized. In view of the discretion CEOs have over goodwill impairment losses, it is an empirical question whether and to what extent compensation committees view impairment losses as an input for performance evaluation.

Hypotheses Development

As discussed in ''Introduction'' section, compensation committees might reduce CEOs' compensation in response to goodwill impairment losses, as goodwill impairments reflect bad acquisitions and/or poor post-acquisition management. Many acquisitions are made for

empire building. Compensation committees, in the interest of discouraging such non-value-enhancing acquisitions as well as mismanagement of the acquired assets, could link compensation to goodwill impairments. This leads us to the first hypothesis (stated in the alternative form):

> **Hypothesis 1 (H1):** CEOs of the firms that recognize goodwill impairment losses will experience a decrease in their compensation from the pre-impairment period to the post-impairment period.

A tension exists in H1 because, as explained in ''Introduction'' section, CEO compensation might be shielded from goodwill impairment losses for at least four reasons: (a) goodwill impairments could occur due to reasons beyond the current CEOs' control, (b) compensation committees might be attempting to prevent the possibility of underinvestment, (c) CEOs might be able to influence the compensation committees by arguing that goodwill impairment losses are ''paper losses,'' or (d) compensation committees do not see any need to penalize CEOs further, as CEOs' wealth is adversely affected by the market reactions to goodwill impairments.

Next, we examine how the change in CEO compensation in response to goodwill impairment losses varies according to factors specific to (a) the firm, (b) the acquisitions, and (c) the CEOs. The first cross-sectional variation that we examine is the nature of the business in which firms are engaged. In designing compensation for CEOs, one of the issues the compensation committees address is moral hazard on the part of CEOs. That is, CEOs need to be incentivized to work hard as well as to make optimal project choices. To identify firms that operate in inherently risky business areas, we focus on R&D intensive firms. The benefits of R&D are often uncertain: In fact, R&D intensity is positively associated with return volatility (Chan, Lakonishok, & Sougiannis, 2001). Then its CEO needs to be compensated for the higher likelihood of R&D investment resulting in failure, even when the CEO takes the desired actions. Some risk is necessary to induce the CEO to work hard, but too much risk induces him or her to forgo risky yet potentially profitable projects. Thus, we expect that compensation committees provide some level of insurance against adverse outcomes of undertaking risky projects (S. Cheng, 2004; Duru, Iyengar, & Thevaranjan, 2002). Consequently, we predict that the CEO compensation is less sensitive to goodwill impairment losses for CEOs of firms that are more R&D intensive than for the CEOs of firms that are less R&D intensive, leading to the following hypothesis:

> **Hypothesis 2 (H2):** The decrease in CEO compensation in response to the recognition of goodwill impairment losses is smaller in firms that are more R&D intensive than those that are less R&D intensive.

Furthermore, we examine how the changes in CEO compensation and goodwill impairment losses vary according to factors specific to the acquisitions. Prior studies provide evidence that goodwill impairments may result from suboptimal acquisition decisions in the past. For example, Hayn and Hughes (2006) show that the characteristics of the original acquisitions are more powerful predictors of subsequent goodwill write-offs than the post-acquisition performance of the acquired entity. They find that firms that end up writing down goodwill in the future periods tend to have used more stock as a means of payment, paid larger premiums, and have allocated a higher percentage of the acquisition price to goodwill. Using more recent data, Olante (2013) finds similar results on stock transaction

and goodwill allocation, but no results on premiums. This finding supports the anecdotal evidence that analysts tend to view impairment losses as ''an indication of corporate spending far too much during the merger mania of the last decade'' (Healy, 2009).

All of this evidence is consistent with previous arguments that the tendency to increase firm size is itself a reflection of agency problems (Jensen, 1986) and that increasing firm size through acquiring larger targets might be an indication of empire building. Grinstein and Hribar (2004) find that 39% of the CEOs who made large acquisitions (greater than US$1 billion) receive bonuses explicitly tied to the completion of acquisitions. Even without explicit bonuses, acquiring CEOs are likely to be rewarded from acquisitions by increasing the size of the firm. When executives acquire large targets and subsequent impairments underscore the diminution in the economic value of goodwill, the compensation committees could react more negatively to the CEOs who have acquired larger targets than to the CEOs who have acquired smaller targets in the past. In some cases, compensation committees might be clawing back the acquisition bonuses given earlier to the CEOs. Accordingly, we hypothesize that,

> **Hypothesis 3 (H3):** The decrease in CEO compensation in response to the recognition of goodwill impairment losses is larger in firms that have acquired larger targets than firms that have acquired smaller targets.

Next, we examine whether the decrease in CEO compensation in response to goodwill impairment losses differs for firms that have longer tenured CEOs compared with those that have shorter tenured CEOs. Tenure works in two different ways. On one hand, as longer tenure provides more information about the CEO's ability through performance record, it mitigates the problem of adverse selection. As CEOs accumulate track records with their tenure, new information becomes less important in the effort to identify the CEO's innate ability. Thus, we expect CEO's compensation to become less sensitive to goodwill impairment losses, which provides incremental information on the past acquisition efforts. Furthermore, CEOs with longer tenure are likely to have greater power within their firm perhaps due to their entrenchment.

On the other hand, CEOs who are closer to retirement might require higher powered incentives to work hard. They are no longer concerned with career development (Gibbons & Murphy, 1992). In addition, CEOs with longer tenure are more likely to be the CEOs who were responsible for the acquisitions for which goodwill impairment losses are recognized. So, it is an empirical question whether and how the change in CEO compensation in response to goodwill impairment losses differs according to the CEO tenure. This leads to the following hypothesis (stated as null):

> **Hypothesis 4 (H4):** The decrease in CEO compensation in response to the recognition of goodwill impairment losses is not different for CEOs with longer tenure than for CEOs with shorter tenure.

Research Design

Description of Sample

As Panel A of Table 1 shows, we select the years 2002-2009 to examine the relation between the changes in CEO compensation and goodwill impairment losses. We start our

Table I.

Panel A: Sample Selection and Data Sources.

	Number of firm-years
Full sample	
Available firm-year observations with necessary ExecuComp data over the period 2002-2009	14,218
Less	
Firm-years of firms	
With fewer than 2 years of observations	(8,815)
With no goodwill impairment charge during 2002-2009	
That have CEO turnover during the fiscal year	
Less: Firm-years with missing COMPUSTAT and CRISP data required for the control variables	(1,827)
Less: Firms that belong to the financial industry	(33)
Firm-years of non-financial firms that have at least 2 years of observations, at least one reported goodwill impairment loss and data available ExecuComp, COMPUSTAT, and CRISP during 2002-2009, "full sample"	3,543
Subsample (for acquisition deal hypothesis)	
Full sample	3,543
Less: Firm-years with missing acquisition deal value in SDC database	(862)
Firm-years of firms with available SDC data during 2002-2009 for testing acquisition hypothesis, "subsample"	2,681

Note. Procedures leading to (a) a full sample of firms that have at least 2 years of observations, at least one reported goodwill impairment loss and data available ExecuComp, COMPUSTAT, and CRISP during 2002-2009, and (b) a subsample of firms with available SDC data.

Panel B: Analysis of Goodwill Impairments.

Year	GWI*	GWI
2002	14.292	0.009
2003	29.969	0.006
2004	19.829	0.006
2005	12.835	0.005
2006	24.591	0.004
2007	31.787	0.007
2008	315.894	0.052
2009	83.599	0.021
Mean	74.952	0.015

Note. GWI* is the actual goodwill impairment loss amount (in millions) without scaling by total assets.

443

sample period in 2002 because it is the first year of asset impairment testing under SFAS 142. Our sample selection begins with all 14,218 firm-year observations available on ExecuComp during the years 2002-2009. ExecuComp coverage is limited to firms included in the Standard & Poor's (S&P) 1500, which includes firms in the S&P 500, the S&P 400 Mid-Cap, and the S&P 600 Small-Cap. We then eliminate all firm-years of firms that have no goodwill impairment during the period from 2002 to 2009; firms that have fewer than 2 years of data; and firms with CEO turnover during the fiscal year (total of 8,815 firm-years). We do not include firms that have fewer than 2 years of data because we perform change analyses (as explained below). We exclude firms with CEO turnover during the fiscal year in our main tests because compensation amounts are adjusted with the change in CEO, and including CEO turnover cases would contaminate our results. We also eliminate all firm-years of firms with missing required COMPUSTAT data (1,827 observations), and that are in financial industry (33 observations). These procedures result in a sample of 3,543 firm-year observations, comprised of 873 goodwill impairment and 2,670 firm-year observations with no goodwill impairment over the period 2002-2009. We provide the yearly distribution of the sample goodwill impairment losses in Panel B of Table 1.

We examine three components of CEO compensation: cash compensation (the sum of annual salary and bonus), option grants, and restricted stock as the sum of these components, on average, constitute 85% of CEOs' total compensation. We examine CEO cash compensation because this allows us to investigate the change in the elements of compensation that are directly affected by the change in accounting performance variables. It is also possible that compensation committees take goodwill impairments into account when determining a CEO's equity compensation awards to realign the CEO's incentives to take optimal actions. In fact, Datta, Iskandar-Datta, and Raman (2001) document that CEOs who are compensated with high equity-based compensation make better acquisitions; in particular, their acquisitions are concluded with lower premiums, suggesting that the likelihood of impairment in the future could be smaller. While their study aggregate option and restricted stock into one category, we examine option and restricted stock compensation separately. Because option compensation is more efficient for inducing CEOs to take risky investment decisions, we expect compensation committees to reduce option compensation after the recognition of goodwill impairment losses, which signals that the CEO might have taken too much risk in making acquisitions in the past. We expect restricted stock to be related to goodwill impairment losses to a much smaller extent.

In H3, we test the impact of CEOs' aggressive acquiring behavior on the association between goodwill impairment losses and the CEO compensation, and testing H3 necessitates an operational definition of ''large targets'' in a firm's recent past acquisitions. Our proxy for large targets is above-the-median values of the 5-year average of *deal size* (measured as the dollar value of the deal), which is available through the SDC Platinum database for 2,681 firm-years of our full sample. Thus, we conduct our tests for H3 using deal size and based on 2,681 available firm-years.[6]

Test of H1

To test whether CEO compensation is reduced after the recognition of goodwill impairment losses, we use the following compensation model:

$$\Delta Comp_{it} = \alpha_1 + \alpha_2 \Delta GWI_{it} + \beta \Delta Controls_{it} + Year\ indicators + Industry\ indicators + e,$$

(1)

where $Comp_{it}$ is the natural log of CEO compensation. Compensation is either (a) cash compensation (salary and bonus), (b) the value of option compensation, or (c) the value of restricted stock compensation for firm i during year t; GWI_{it} is the goodwill impairment loss (data item ''gdwlip'') for firm i during year t deflated by $t - 1$ assets.

Recent articles on CEO compensation use a change model to better deal with the potential omitted variable bias (Dikolli, Kulp, & Sedatole, 2009; Huson, Tian, Wiedman, & Wier, 2012). Therefore, we use a change regression to test all the hypotheses. For every variable, we use in the regression analyses, we measure its change from $t - 1$ to t. Depending on the dependent variable, $\Delta LN(Cash\$)$, $\Delta LN(OPTION\$)$, or $\Delta LN(RESTRICT\$)$, we use controls that represent a set of variables known to influence respective compensation. Prior research (e.g., Comprix & Muller, 2006) finds that cash compensation increases with accounting performance (ROA), stock market performance (RET), firm size ($SIZE$), and tenure ($TENURE$). Consistent with prior studies, we expect to find a positive association between the change in cash compensation and performance variables (ΔROA and RET), between cash compensation and firm size ($\Delta SIZE$), as well as between cash compensation and tenure ($TENURE$). We include long-lived asset impairments ($\Delta WRTDWN$), restructuring charges ($\Delta RESTRUCT$), and Other Special Items ($\Delta OTHER\ SPECIAL$) as additional control variables to mitigate the possibility that an effect we find on the coefficient of ΔGWI is in fact driven by these often contemporaneous events. We include year- and industry-fixed effects to mitigate the possibility that our results are affected by potential correlated omitted variables.

Following Q. Cheng and Farber (2008), we model option-based compensation as a function of the following control variables: CEO stock ($\Delta SHARES\_OWN$) and option ownership ($\Delta EXER\_OPT$, $\Delta UNEXER\_OPT$), firm size ($\Delta SIZE$), market to book ratio (ΔMB), R&D intensity (ΔRD), cash constraints ($\Delta CASH\_CST$), idiosyncratic risk ($\Delta RISK$), stock returns (ΔRET), earnings constraints ($\Delta EARN\_CST$), and cash compensation ($\Delta CASH2$). We use the same empirical model for our analyses of the restricted stock compensation. The details for the control variables can be found in the appendix to Q. Cheng and Farber (2008).

Modeling after Comprix and Muller (2006) as well as Q. Cheng and Farber (2008), we include year-fixed effects to capture shifts in the level of CEO compensation over time. Consistent with Comprix and Muller (2006), we also include industry-fixed effects to capture the industry driven changes in compensation over time. This research design allows us to compare the CEO compensation of the same firm in the impairment year with non-impairment years, and thus use each sample firm as its own control.

Our primary variable of interest in Equation 1 is ΔGWI. The coefficient estimate captures the change in compensation in response to change in goodwill impairment loss from $t - 1$ to t. If compensation committees do not shield the compensation of the CEOs from goodwill impairment losses, we expect to find a significantly negative coefficient on ΔGWI. However, if compensation committees shield CEO compensation from goodwill impairment losses, we expect to find no statistical significance on the coefficient on ΔGWI.[7]

Test of H2

We test whether the change in CEO compensation in response to the recognition of goodwill impairment losses is different for firms with higher R&D intensity compared with the firms with lower R&D intensity by modifying Equation 1 as follows:

$$\Delta Comp_{it} = \alpha_1 + \alpha_2 \Delta GWI_{it} + \alpha_3 \Delta GWI_{it} \times R\&D + \alpha_4 R\&D + \beta \Delta Controls_{it}$$
$$+ \ Year \ indicators \ + \ Industry \ indicators \ + \ e, \tag{2}$$

where *R&D* is 1 if R&D expense scaled by sales is greater than the upper quartile of R&D in the entire sample; 0 otherwise.

The coefficient on ΔGWI in Equation 2 measures the change in CEO compensation in response to the recognition of goodwill impairment losses for firms that are not R&D intensive, and the coefficient on the interaction term, $\Delta GWI_{it} \times R\&D$, measures how this change differs for firms that are more R&D intensive. If compensation committees shield CEOs' compensation from goodwill impairment losses when they award compensation to CEOs in R&D intensive firms, then we would expect to find a significantly positive coefficient on $\Delta GWI_{it} \times R\&D$ ($\alpha 3$).

Test of H3

To test whether the change in CEO compensation in response to goodwill impairment losses is different for firms that have acquired large targets compared with the firms that have acquired smaller targets, we modify Equation 1 as follows:

$$\Delta Comp_{it} = \alpha_1 + \alpha_2 \Delta GWI_{it} + \alpha_3 \Delta GWI_{it} \times DEAL + \alpha_4 DEAL + \beta \Delta Controls_{it}$$
$$+ \ Year \ indicators \ + \ Industry \ indicators \ + \ e, \tag{3}$$

where *DEAL* is 1 if the average deal value of last 5 years acquisition in the given year is greater than the median of the last 5 years acquisition of that given year.[8]

A negative and significant coefficient on $\Delta GWI_{it} \times DEAL$ in Equation 3 would be consistent with the notion that compensation committees penalize more the CEOs who have acquired larger targets, compared with those who acquired smaller targets.

Test of H4

To test whether the change in CEO compensation following the recognition of impairment losses differs according to a CEO's tenure, we modify Equation 1 as follows:

$$\Delta Comp_{it} = \alpha_1 + \alpha_2 \Delta GWI_{it} + \alpha_3 \Delta GWI_{it} \times TENURE\_D + \beta \Delta Controls_{it}$$
$$+ \ Year \ indicators \ + \ Industry \ indicators \ + \ e, \tag{4}$$

where *TENURE_D* is 1 if *TENURE* is greater than the upper quartile of *TENURE* of the entire sample; 0 otherwise; *TENURE* is the number of years since the CEO assumed the office.

We expect α_3 in Equation 4 to have statistical significance if compensation committees weigh goodwill impairments differently when they award compensation to CEOs who have a longer tenure.

Results

Results of Univariate Analyses

In Panel A of Table 2, we present descriptive statistics for the full sample partitioned based on the pooled goodwill impairment ($n = 873$) versus no goodwill impairment firm-year

Table 2. Descriptive Statistics of Full Sample, Partitioned Based on Goodwill Impairment Versus No Goodwill Impairment Loss.

| Variables | Goodwill impairment firm-years | | | | | No goodwill impairment firm-years | | | | | Wilcox. |
	Mean	25%	Median	75%	n	Mean	25%	Median	75%	n	p value
$\Delta(CASH\$)$	−169	−91	3	75	873	15	−121	25	210	2,670	.001
$\Delta(OPTION\$)$	−488	−513	0	147	873	−189	−445	0	254	2,670	.078
$\Delta(RESTRICT\$)$	−235	−269	0	187	873	217	0	0	335	2,670	.001
$\Delta TOTAL$	−1,047	−1,317	−151	679	873	194	−711	127	1,125	2,670	.000
ΔGWI	0.050	0.001	0.016	0.075	873	−0.012	0.000	0	0.000	2,670	.001
ΔROA	−0.023	−0.042	−0.010	0.010	873	0.001	−0.016	0.002	0.020	2,670	.001
$RET1$	−0.142	−0.523	−0.207	0.135	873	0.148	−0.159	0.077	0.340	2,670	.001
$\Delta WRTDWN$	0.003	0.000	0.000	0.002	873	−0.001	0.000	0.000	0.000	2,670	.001
$\Delta RESTRUCT$	0.002	0.000	0.000	0.004	873	−0.001	−0.001	0.000	0.000	2,670	.001
$\Delta OTHER$	−0.003	−0.005	0.000	0.003	873	0.000	−0.004	0.000	0.004	2,670	.115
$\Delta LN(TA)$	−0.095	−0.215	−0.070	0.039	873	0.071	−0.023	0.047	0.134	2,670	.001
$TENURE$	8.055	4.000	6.000	10.000	873	7.862	4.000	6.000	10.000	2,670	.565
$\Delta SHARES\_OWN$	−0.833	−0.401	0.097	0.957	873	−1.740	−0.594	0.041	0.626	2,670	.008
$\Delta EXER\_OPT$	−0.498	−0.856	0.245	1.497	873	−0.075	−0.890	0.352	1.797	2,670	.110
$\Delta UNEXER\_OPT$	−0.094	−0.720	0.000	0.438	873	−0.355	−1.018	−0.010	0.370	2,670	.023
$\Delta SIZE$	−0.039	−0.138	−0.005	0.083	873	0.061	−0.015	0.070	0.161	2,670	.001
ΔMB	−0.256	−0.752	−0.181	0.318	873	−0.066	−0.526	−0.021	0.430	2,670	.001
ΔRD	0.004	0.000	0.000	0.001	873	−0.001	0.000	0.000	0.000	2,670	.001
$RET2$	−0.039	−0.469	−0.143	0.260	873	0.048	−0.360	−0.009	0.368	2,670	.001
$\Delta CASH\_CST$	−0.013	−0.083	−0.012	0.049	873	−0.001	−0.063	−0.002	0.058	2,670	.003
$\Delta EARN\_CST$	0.103	0.000	0.000	0.000	873	−0.010	0.000	0.000	0.000	2,670	.001
$\Delta CASH2$	0.011	−0.071	0.010	0.119	873	−0.042	−0.165	−0.005	0.108	2,670	.001
ΔLEV	0.012	−0.025	0.000	0.048	873	−0.004	−0.037	−0.001	0.015	2,670	.001
$\Delta RISK$	0.014	−0.004	0.009	0.029	873	−0.002	−0.011	−0.002	0.006	2,670	.001
$R\&D$	0.230	0	0	0	873	0.258	0	0	1	2,670	.104
$DEAL$	0.346	0	0	1	674	0.342	0	0	1	2,007	.854
$TENURE\_D$	0.242	0	0	0	873	0.216	0	0	0	2,670	.120

Note. Variable Definitions: *LN(CASH$)* = natural logarithm of 1 plus CEO's salary and bonus; *LN(OPTION$)* = natural logarithm of 1 plus the Black-Scholes value of annual option-based compensation; *LN(RESTRICT$)* = natural logarithm of 1 plus value of the restricted stock; *LN(TOTAL)* = natural logarithm of 1 plus total CEO compensation; *GWI* = goodwill impairment scaled by total assets at the beginning of the year; *ROA* = income before extraordinary items and special items, scaled by total assets at the beginning of the year; *RET1* = last year's raw return calculated as year-end price less beginning of the year price, then scaled by beginning of the year price; *WRTDWN* = write-downs scaled by total assets at the beginning of the year; *RESTRUCT* = restructure charges scaled by total assets at the beginning of the year; *OTHER_SPECIAL* = special items minus goodwill impairment, write-downs, and restructure charges, scaled by total assets at the beginning of the year; *Ln(TA)* = natural logarithm of total assets; *TENURE* = number of years since the CEO assumed the office plus 1; *SHARES_OWN* = CEO's ownership in shares (options excluded) divided by number of outstanding shares; *EXER_OPT* = CEO's exercisable options in shares divided by number of outstanding shares; *UNEXER_OPT* = CEO's unexercisable options in shares less current year option grants divided by number of outstanding shares; *SIZE* = natural logarithm of sales; *MB* = market value of assets divided by book value; *RD* = research and development expenses; *RET2* = accumulated 12-month stock returns (the multiplication of the monthly returns); *CASH_CST* = common and preferred dividends less net cash flow from investment activities minus net cash flow from operating activities, scaled by total assets; *EARN_CST* = 1 if there is an operating earnings loss; 0 otherwise; *CASH2* = sum of annual salary and bonus divided by sales; *LEV* = long-term assets divided by total assets; *RISK* = standard deviation of the residual from the market model using weekly returns over past 12 months; *R&D* = 1 if R&D expense scaled by sales is greater than the upper quartile of R&D in the entire sample; 0 otherwise; *DEAL* = 1 if the average deal value of last 5 years acquisitions in the given year is greater than the median of the last 5 years acquisition of that given year; *TENURE_D* = 1 if TENURE is greater than the upper quartile of TENURE of the entire sample; 0 otherwise.

observations (n = 2,670). Providing support for H1, the change in cash compensation (Δ*CASH*), option-based compensation (Δ*OPTION*), restricted compensation (Δ*RESTRICT*), and total CEO compensation (Δ*TOTAL*) are all negative and significantly lower for goodwill impairment observations compared with non-impairment observations. Consistent with prior research, firms exhibit worse accounting and stock market performance in goodwill impairment years relative to non-impairment years, reflected in lower means and median for Δ*ROA* and *RET*. As reflected in the means for Δ*WRTDWN* and Δ*RESTRUCT*, some firms tend to report long-lived asset impairment losses and restructuring charges concurrently with goodwill impairments, suggesting that it is important to control for these concurrent events in the multivariate analyses. Furthermore, in impairment years compared with non-impairment years, firms experience more positive changes in percentage of CEOs share ownership, the value of CEOs unexercisable option holdings, R&D expenditures, leverage, and risk. As expected, impairment years are characterized by reduction in firm size and growth opportunities.

In Panel A of Table 3, we present Pearson correlations between the variables that we use in the cash compensation model. Consistent with our expectations, we find a positive and statistically significant correlation between Δ*LN(Cash$)* and Δ*ROA* (0.116, p = .001), Δ*RET* (0.096, p = .001), and Δ*SIZE* (0.052, p = .002). However, we find a negative and statistically significant correlation between Δ*LN(Cash$)* and Δ*GWI* (−0.080, p = .001), and Δ*WRTDWN* (−0.039, p = .022).

In Panel B of Table 3, we report that the correlations between the variables used in the option-based and restricted stock compensation models. The results show that Δ*LN(OPTION$)* is negatively correlated with Δ*GWI*. However, Δ*LN(RESTRICT$)* is not significantly correlated with Δ*GWI*. The correlations between changes in options (or restricted stock) and the control variables are generally significant in the predicted directions.

Results of Multivariate Analyses

Table 4 presents the results from estimating Equation 1. In the first column, we present the results from estimating the model of cash compensation as a function of goodwill impairment losses, control variables as well as year- and firm-fixed effects. The estimated coefficient of −0.337 (with p value of .002) on Δ*GWI* indicates that the change in CEO cash compensation is significantly lower for firms that recognize goodwill impairment losses than that for firms that do not recognize goodwill impairment losses, as predicted in H1. We find that both Δ*ROA* and *RET1* are positively and significantly associated with the change in the log of cash compensation (p < .001 for both). We find no significance on the coefficients on other write-downs, restructuring charges, or other special items. Finding strong significance on the estimated coefficient on Δ*GWI* in the presence of other special charges indicates that the association between goodwill impairment loss and the change CEO cash compensation is unlikely to be driven by the effect of other charges. The coefficient on the *TENURE* is positive and significant at the 10% level. Finally, we find a positive association between Δ*Size* and the change in cash compensation, and the association is significant at the 1% level. The model has an adjusted R^2 of .17. Overall, the results from the estimation of Equation 1 are consistent with the findings of prior research (Comprix & Muller, 2006; Dechow et al., 1994; Gaver & Gaver, 1998).

The second column of Table 4 presents the results from estimating the modified version of Equation 1, regressing the change in option compensation on Δ*GWI* and controls. The

Table 3.

Panel A: Pearson Correlations for the Variables Used in the Cash Compensation Model.

	ΔLN(CASH$)	ΔROA	RET	ΔGWI	ΔWRTDWN	ΔRESTRUCT	ΔOTH_SPEC	ΔSIZE	TENURE
ΔLN(CASH$)	1								
ΔROA	.116	1							
	.000								
RET	.096	.254	1						
	.000	.000							
ΔGWI	−.080	−.070	−.284	1					
	.000	.000	.000						
ΔWRTDWN	−.039	−.011	−.152	.127	1				
	.022	.517	.000	.000					
ΔRESTRUCT	−.027	−.061	−.112	.037	.036	1			
	.108	.000	.000	.027	.034				
ΔOTHER_SPECIAL	.000	.128	−.033	.023	−.005	−.009	1		
	.985	.000	.050	.171	.766	.580			
ΔSIZE	.052	.238	.060	.024	−.011	−.017	.035	1	
	.002	.000	.000	.152	.526	.319	.038		
TENURE	−.008	−.021	−.012	−.011	.007	.016	.004	.010	1
	.656	.207	.490	.496	.664	.345	.810	.565	

Panel B: Pearson Correlations for the Variables Used in the Option-Based and Restricted Stock Compensation Models.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	ΔLN(OPTION$)	1														
(2)	ΔLN(RESTRICT$)	.053	1													
		.002														
(3)	ΔGWI	−.023	.020	1												
		.090	.120													
(4)	ΔSHARES	−.049	−.023	.004	1											
		.004	.169	.797												
(5)	ΔEX_OPT	−.029	−.027	−.015	.133	1										
		.082	.104	.369	.000											
(6)	ΔUNEX_OPT	−.226	−.045	−.017	−.018	−.018	1									
		.000	.007	.304	.278	.279										
(7)	ΔSIZE	.015	.074	.024	−.035	−.032	−.033	1								
		.370	.000	.152	.036	.057	.047									
(8)	ΔMB	−.018	.028	−.045	.000	.002	−.016	−.004	1							
		.289	.102	.008	.991	.920	.336	.813								
(9)	ΔRD	.000	.016	.119	.028	.012	−.037	−.066	−.048	1						
		.984	.347	.000	.097	.483	.026	.000	.004							
(10)	ΔRET2	−.069	−.031	−.235	−.001	−.006	.031	−.178	.223	−.125	1					
		.000	.069	.000	.976	.726	.069	.000	.000	.000						
(11)	ΔCASH_CST	−.004	.005	.020	−.019	−.010	−.005	.055	−.053	.043	−.155	1				
		.821	.746	.246	.262	.562	.779	.001	.002	.011	.000					
(12)	ΔEARN_CST	.007	−.024	.081	.001	−.018	−.020	−.236	−.050	.155	−.046	.071	1			
		.667	.148	.000	.960	.286	.244	.000	.003	.000	.006	.000				
(13)	ΔCASH2	.011	−.004	−.108	.011	.056	.020	−.348	.015	.023	.116	−.051	.025	1		
		.512	.796	.000	.497	.001	.235	.000	.381	.174	.000	.002	.143			
(14)	ΔLEV	.022	−.002	.045	.062	.008	.007	−.037	−.011	−.005	−.057	.235	.069	−.035	1	
		.192	.912	.007	.000	.616	.681	.028	.506	.758	.001	.000	.000	.037		
(15)	ΔRISK	.025	−.046	.138	.052	−.076	.007	−.120	−.086	.137	−.131	−.026	.142	.007	.121	1
		.143	.006	.000	.002	.000	.699	.000	.000	.000	.000	.117	.000	.672	.000	

Note. All variables are defined in the footnote of Table 2.

estimated coefficient of −1.855 (with *p* value of .001) on Δ*GWI* indicates that a goodwill impairment loss is associated with a subsequent reduction in the CEO option compensation. To understand it in a more intuitive way, consider the following example. Assume that there is no *GWI* recognized in the year $t − 2$ and $t − 1$ and the option compensation is US$1.68 million (using our sample mean for firms without impairment) each year. In year $t = 0$, the company recognized *GWI* = 0.05 consistent with the mean of the change in *GWI* in our sample. A coefficient of −1.855 means, ceteris paribus, the option compensation will be reduced to 1.53 million ($1.68 \times e^{-1.855 \times 0.05}$) from US$1.68 million, an almost 10% reduction. The coefficients on the control variables generally show that CEOs with high stock or option ownership are awarded fewer option grants. For the other control variables, Δ*RD*, Δ*CASH_CST*, Δ*LEV*, and Δ*RISK* have insignificant coefficients with signs that are opposite to our predictions and *RET2* has the sign opposite to our prediction. In all tests, we report *p* values based on one-tailed *t* tests when the coefficient sign is predicted and based on two-tailed *t* tests otherwise.

The third column of Table 4 reports the results of regressing the change in restricted stock grants on the Δ*GWI* and controls. We report a coefficient of 0.654 on Δ*GWI*, which is not significant at the conventional levels. The coefficients on the control variables are essentially similar in sign (but not necessarily in significance) to those observed for the option compensation model (column 2).

Overall, the evidence is consistent with the notion that reported goodwill impairments are associated with subsequent reduction in CEO cash and option compensation but no reduction in the value of restricted stock grants. The reduction in option compensation is likely to reflect the realignment of incentives for risk taking.

To investigate whether the change in CEO compensation in response to goodwill impairment losses differs across R&D intensity level of the firms, we estimate Equation 2 allowing the coefficients on goodwill impairment losses and other special charges to vary according to the R&D intensity of the firm (R&D intensive vs. non-R&D intensive as captured by the indicator variable *R&D*). We define a firm as R&D intensive if its R&D intensity (R&D expense scaled by lagged sales) is above the upper quartile R&D intensity of all firms in the full sample. In the first column of Table 5, we report results from estimating Equation 2 with the change in cash compensation as the dependent variable. We find that the coefficient on Δ*GWI* which measures the change in CEO cash compensation in response to the recognition of goodwill impairment losses is negative and significant (*p* value of .011) for firms that are not R&D intensive. The coefficient on Δ*GWI* × *R&D*, which measures how this change differs for firms that are more R&D intensive, is negative, but not statistically significant at the conventional levels. This result implies that compensation committees do not weigh goodwill impairments differently when they award cash compensation to CEOs in R&D intensive firms. For the control variables, we find statistically significant results in the predicted directions for the other determinants of cash compensation with the exception of *TENURE* and the model has an adjusted R^2 of 18%.

In the second column of Table 5, we report the results from estimating the modified version of Equation 2, regressing the change in option compensation on the Δ*GWI*, the interaction of Δ*GWI* and R&D as well as controls. We find that for the firms that are not R&D intensive (*R&D* = 0), the coefficient on *GWI* is −2.868 and significant at $p < .001$, while it is −0.590 (Δ*GWI* + Δ*GWI* × *R&D*) with no statistical significance for the firms that are R&D intensive (*R&D* = 1). These results show that the reduction in CEOs' option compensation is not statistically significant in R&D intensive firms while it is statistically significant in non-R&D intensive firms.

Table 4. Regression Analyses of Changes in CEO Compensation (Hypothesis 1) Using the Full Sample of 3,543 Observations Over 2002-2009.

Independent variables	Expected sign	$\Delta LN(CASH\$)$		$\Delta LN(OPTION\$)$		$\Delta LN(RESTRICT\$)$	
		Coefficient estimate	p value	Coefficient estimate	p value	Coefficient estimate	p value
Intercept	+	0.169	.001	−0.193	.366	0.029	.883
ΔGWI	−	**−0.337**	**.002**	**−1.855**	**.001**	**0.654**	**.130**
ΔROA	+	0.594	.001				
RET1	+	0.081	.001				
ΔWRTDWN	?	−0.547	.187				
ΔRESTRUCT	?	−0.057	.909				
ΔOTHER_SPECIAL	?	−0.207	.259				
ΔSIZE	+	0.105	.007	0.201	.550	0.817	.014
TENURE	+	−0.001	.109				
ΔSHARES_OWN	−			−0.016	.004	−0.005	.339
ΔEXER_OPT	−			−0.018	.211	−0.019	.138
ΔUNEXER_OPT	−			−0.248	.001	−0.044	.028
ΔMB	+			0.000	.987	0.030	.188
ΔRD	+			−3.158	.448	5.226	.231
RET2	+			−0.246	.050	−0.038	.732
ΔCASH_CST	+			−0.530	.311	−0.126	.791
ΔEARN_CST	?			0.069	.740	−0.081	.702
ΔCASH2	?			0.043	.701	0.160	.098
ΔLEV	−			1.054	.220	0.369	.655
ΔRISK	+			−3.108	.339	−5.319	.076
Year indicators		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes	
Adjusted R^2		.17		.06		.01	
N		3,543		3,543		3,543	

Note. The dependent variable is the log of cash compensation or option-based compensation or restricted stock compensation. All variables are defined in the footnote of Table 2. Values in bold indicate the main variables of interest.

451

Table 5. Regression Analyses of Changes in CEO Compensation (Hypothesis 2) Across Firms With Higher Versus Lower R&D Using the Full Sample of 3,543 Observations Over 2002-2009.

Independent variables	Expected sign	ΔLN(CASH$) Coefficient estimate	p value	ΔLN(OPTION$) Coefficient estimate	p value	ΔLN(RESTRICT$) Coefficient estimate	p value
Intercept	+	0.156	.000	−0.190	.373	−0.054	.785
ΔGWI	−	**−0.297**	**.011**	**−2.868**	**.001**	**0.442**	**.547**
ΔGWI × **R&D**	+	**−0.103**	**.284**	**2.278**	**.034**	**0.423**	**.711**
ΔROA	+	0.636	.000				
RET1	+	0.080	.000				
R&D		0.049	.023	−0.026	.825	0.353	.004
ΔWRTDWN	?	−1.097	.015				
ΔWRTDWN × R&D	?	1.768	.042				
ΔRESTRUCT	?	−0.532	.409				
ΔRESTRUCT × R&D	?	0.929	.340				
ΔOTHER_SPECIAL	?	−0.474	.040				
ΔOTHER_SPECIAL × R&D	?	0.437	.172				
ΔSIZE	+	0.106	.013	0.167	.619	0.784	.018
TENURE	+	−0.001	.210				
ΔSHARES_OWN	−			−0.016	.004	−0.005	.325
ΔEXER_OPT	−			−0.017	.231	−0.019	.135
ΔUNEXER_OPT	−			−0.247	.000	−0.044	.027
ΔMB	+			−0.002	.933	0.029	.203
ΔRD	+			−4.154	.315	4.515	.302
RET2	+			−0.251	.046	−0.040	.720
ΔCASH_CST	+			−0.505	.334	−0.135	.777
ΔEARN_CST	?			0.070	.736	−0.087	.681
ΔCASH2	?			0.045	.687	0.160	.098
ΔLEV	−			1.053	.220	0.324	.695
ΔRISK	+			−3.079	.343	−5.053	.093
ΔGWI + **ΔGWI** × **R&D**		**−0.400**	**.001**	**−0.590**	**.461**	**0.865**	**.348**
Year indicators		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes	
Adjusted R^2		.18		.06		.01	
N		3,543		3,543		3,543	

Note. The dependent variable is the log of cash or option-based or restricted stock compensation. All variables are defined in the footnote of Table 2. Values in bold indicate statistical significance.

452

In the third column of Table 5, we present the results from estimating Equation 2 with the change in restricted stock grants as the dependent variable. The coefficients on the main variables of interest (ΔGWI and $\Delta GWI \times R\&D$) are not significant at the conventional levels. Overall, we find mixed evidence for the hypothesis that the change in CEO compensation in response to the recognition of goodwill impairment losses is different for firms with higher R&D intensity compared with the firms with lower R&D intensity.

Table 6 presents the results from estimating Equation 3, which allows us to test whether the change in CEO compensation in response to goodwill impairment losses differs across firms that acquired larger targets versus smaller targets. Acquisition of larger versus smaller targets is captured by the variable *DEAL*, which is coded 1 if the average deal value of last 5 years acquisition in the given year is greater than the median of the last 5 years acquisition of that given year, and 0 otherwise. Based on the results, we report in the first column of Table 6, we find that for the firms that have not acquired large targets (*DEAL* = 0), the reduction in CEO cash compensation in response to ΔGWI is not statistically significant as indicated by the coefficient estimate of −0.156 and *p* value of .120, while it is stronger and statistically significant for the firms that have acquired larger targets (*DEAL* = 1) as given by the coefficient estimate of −0.532 and *p* value of .001.

As reported in the second and third columns of Table 6, option compensation is reduced more for CEOs of firms that have acquired large targets compared with CEOs firms that have acquired small targets in the past 5 years; however, the difference is not statistically significant at conventional levels. Consistent with the results reported earlier, restricted stock compensation is not specifically changed by goodwill impairment losses. Overall, these results suggest that CEOs who might have engaged in large acquisitions that ended up requiring impairment see reduction only in their cash compensation. Reduction in cash compensation is likely to discourage future acquisitions.

To investigate whether the change in CEO compensation in response to goodwill impairment losses differs according to the tenure of CEOs, we estimate Equation 4 allowing the coefficients on goodwill impairment losses, other special charges to vary according to the CEO tenure (long tenure vs. short tenure as captured by the indicator variable *TENURE_D*). Our results, which we report in Table 7, show that while there is no reduction in the cash compensation of the long tenure CEOs, there is a strong reduction in cash compensation of the short tenure CEOs. Specifically, the estimated coefficient on ΔGWI is −0.403 (*p* value of .001) for the short tenure CEOs while it is 0.006 (*p* value of .965) for the long tenure CEOs. However, we do not find a statistically significant difference across longer tenured versus shorter tenured CEOs in terms of the impact of *GWI* on option or restricted stock compensation. This result is interesting given that longer tenured CEOs are likely to be responsible for the past acquisitions that required write-downs. The result is, however, consistent with the notion that CEOs with longer tenure have better track record or alternatively, are more entrenched and protected.

In examining the question as to whether the compensation committees shield executives from the effect of restructuring charges, Adut et al. (2003) find cross-sectional variations in the degree of shielding. They show that the committees tend to shield executives from adverse effects of initial and subsequent restructuring charges for CEOs with a long tenure. Our findings corroborate those of Adut et al. (2003). We find that CEOs with a shorter tenure, that is, in their earlier stage of tenure, are more likely to experience reductions in their cash compensation as a result of impairment losses than CEOs with a longer tenure. Our results are consistent with the notion that the value of new information reflected in

Table 6. Regression Analyses of Changes in CEO Compensation (Hypothesis 3) Across Firm That Acquired Larger Targets Versus Smaller Targets Using the Restricted Sample of 2,681 Observations Over 2002-2009.

Independent variables	Expected sign	ΔLN(CASH$)		ΔLN(OPTION$)		ΔLN(RESTRICT$)	
		Coefficient estimate	p value	Coefficient estimate	p value	Coefficient estimate	p value
Intercept	+	0.150	.000	−0.153	.571	−0.028	.905
ΔGWI	−	**−0.156**	**.120**	**−1.390**	**.245**	**−0.838**	**.474**
ΔGWI × DEAL	−	**−0.376**	**.023**	**−2.488**	**.270**	**1.988**	**.256**
ΔROA	+	0.737	.000				
RET1	+	0.002	.946				
ΔWRTDWN	?	−0.827	.108				
ΔRESTRUCT	?	−0.065	.909				
ΔOTHER_SPECIAL	?	−0.303	.209				
ΔSIZE	+	0.129	.002	0.630	.091	1.218	.001
DEAL	+	−0.017	.339	0.105	.312	−0.076	.487
ΔSHARES_OWN	−			−0.008	.003	−0.002	.520
ΔEXER_OPT	−			−0.014	.301	0.000	.969
ΔUNEXER_OPT	−			0.213	.000	−0.015	.201
ΔMB	+			0.000	.685	0.000	.229
ΔRD	+			−1.961	.377	3.581	.167
RET2	+			−0.165	.102	−0.079	.248
ΔCASH_CST	+			−0.094	.848	−0.356	.463
ΔEARN_CST	?			0.128	.578	0.105	.664
ΔCASH2	?			0.034	.274	0.074	.073
ΔLEV	−			−0.036	.967	0.496	.601
ΔRISK	+			−2.113	.519	−1.747	.510
ΔGWI + ΔGWI × DEAL	−	**−0.532**	**.001**	**−3.878**	**.056**	**1.150**	**.456**
Year indicators		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes	
Adjusted R^2		.19		.08		.01	
n		2,681		2,681		2,681	

Note. The dependent variable is the log of cash or option-based or restricted stock compensation. All variables are defined in the footnote of Table 2. Values in bold indicate statistical significance.

454

Table 7. Regression Analyses of Changes in CEO Compensation (Hypothesis 4) Across Long Tenure Versus Short Tenure CEOs Using the Full Sample of 3,543 Observations Over 2002-2009.

Independent variables	Expected sign	ΔLN(CASH$) Coefficient estimate	p value	ΔLN(OPTION$) Coefficient estimate	p value	ΔLN(RESTRICT$) Coefficient estimate	p value
Intercept	+	0.163	.000	−0.177	.409	0.111	.579
Δ**GWI**	−	**−0.403**	**.000**	**−2.036**	**.001**	**0.775**	**.270**
Δ**GWI** × **TENURE_D**	+	**0.409**	**.013**	**1.044**	**.505**	**−0.923**	**.460**
ΔROA	+	0.587	.000				
RET1	+	0.083	.000				
ΔWRTDWN	?	−0.626	.264				
ΔWRTDWN × TENURE_D	?	0.185	.810				
ΔRESTRUCT	?	−0.177	.795				
ΔRESTRUCT × TENURE_D	?	0.381	.638				
ΔOTHER_SPECIAL	?	−0.194	.293				
ΔOTHER_SPECIAL × TENURE_D	?	−0.129	.816				
ΔSIZE	+	0.107	.011	0.202	.548	0.802	.016
TENURE	+	−0.017	.216	−0.071	.485	−0.390	.000
ΔSHARES_OWN	−			−0.016	.004	−0.005	.335
ΔEXER_OPT	−			−0.018	.205	−0.020	.117
ΔUNEXER_OPT	−			−0.248	.000	−0.045	.025
ΔMB	+			0.001	.983	0.030	.194
ΔRD	+			−3.198	.442	5.500	.208
RET2	+			−0.243	.053	−0.043	.700
ΔCASH_CST	+			−0.540	.304	−0.137	.774
ΔEARN_CST	?			0.068	.744	−0.079	.708
ΔCASH2	?			0.038	.730	0.156	.107
ΔLEV	−			1.056	.219	0.373	.651
ΔRISK	+			−2.980	.362	−5.200	.086
Δ**GWI** + Δ**GWI** × **TENURE_D**		**0.006**	**.965**	**0.992**	**.496**	**−0.148**	**.887**
Year indicators		Yes		Yes		Yes	
Industry indicators		Yes		Yes		Yes	
Adjusted R²		.17		.06		.01	
N		3,543		3,543		3,543	

Note. The dependent variable is cash compensation or option-based compensation or restricted stock compensation. All variables are defined in the footnote of Table 2. Values in bold indicate statistical significance.

goodwill impairments is smaller when assessing performance of a CEO with a long track record than a CEO in an early stage of tenure.

Overall, our results strongly suggest that, on average, the compensation committees reduce the compensation of the CEOs who report goodwill impairment losses. Specifically, we find that the decrease in CEO option-based compensation in response to goodwill impairment losses is driven by firms that are not R&D intensive, and the decrease in CEO cash compensation in response to goodwill impairment losses is driven by firms that acquired large targets in the recent past, and have CEOs with a shorter tenure.

Additional Analyses

One interesting case that arises in our setting is that CEOs in their first year of appointment typically (a) record impairments to clear the decks as documented by Francis et al. (1996) and (b) receive more compensation than their predecessors. We therefore expect that the reduction in compensation of the new CEOs for the first year impairment charges is less than that of the extant CEOs for the impairment charges. To test this conjecture, we run the following empirical models:

$$\Delta Comp_{it} = \alpha_1 + \alpha_2 \Delta GWI_{it} + \alpha_3 \Delta GWI_{it} \times NEWCEO + \alpha_4 NEWCEO + \beta \Delta Controls_{it} \\ + \ Year \ indicators + Industry \ indicators + e, \tag{5}$$

where *NEWCEO* is 1 if it is the first year of the CEO's appointment; 0 otherwise.

In untabulated results, we find that when using the log of change in cash compensation as the dependent variable, for the firms with the extant CEOs (*NEWCEO* = 0), the coefficient on *GWI* is -0.342 and significant with a *p* value of .003, while it is 0.239 ($\Delta GWI_{it} + \Delta GWI_{it} \times NEWCEO$) with no statistical significance for firms with the new CEOs. The inferences are the same when using the log of change in option-based compensation: The coefficient on ΔGWI_{it} is -1.862 (significant at the .01 level) while the coefficient on $\Delta GWI_{it} + \alpha_3 \Delta GWI_{it} \times NEWCEO$ is -6.543, which is not significant at the conventional levels (*p* = .777). When using the log of the change in restricted stock grants, we do not find any significance on ΔGWI_{it} or $\Delta GWI_{it} \times NEWCEO$. Consistent with our expectation, these results indicate that the new CEOs' cash and option-based (and restricted stock) compensation are shielded from goodwill impairment losses and that H1 holds except for new CEOs.

It is possible that the CEOs try to time goodwill impairments to minimize the adverse consequence on their compensation. Then, they would time goodwill impairment to coincide with a year of poor performance when there are already no bonuses awarded (big bath). Our earlier results might simply be due to the timing of the impairment charge much like the ''new CEO'' effect described above. To see if the association between the change in CEO compensation and change in *GWI* is affected by big bath taking, we re-run our regression after removing those firms that are likely to have taken a big bath (using the measurement of big bath variable in Riedl, 2004). The results (untabulated) are very similar to those with all firms. In particular, the coefficient estimate on ΔGWI (-0.377, *p* = $-.000$) remains the same for bonus, slightly higher (-1.655, *p* = $-.001$) for options. The coefficient on restricted stock is insignificant in both regressions. Thus, our main inferences are unchanged when we control for the cases in which CEOs opportunistically time the impairment decisions.[9]

Our main analyses strongly suggest that compensation committees reduce the cash and option-based compensation of the CEOs who report impairment of goodwill. Because the compensation committees are part of the corporate boards, we examine whether the quality of the boards influences on the relation between changes in CEO compensation and goodwill impairment losses. We focus the CEO–chair duality of the boards. We use an indicator variable for firms that have CEO–chair duality, interact with the variable *GWI* and estimate Equation 1. The results (untabulated) show no difference in the relation between goodwill impairments and the change in CEO compensation across the firms with CEO–chair duality versus separation except for the cash compensation model.[10] Thus, the results show only weak evidence that the reduction in CEO's overall compensation in response to *GWI* is different across firms with CEO–chair duality versus separation.

In addition, we examine the possibility that CEOs manage to maintain the same level of compensation through negotiating other forms of pay such that total compensation remains unaffected when impairments are recorded. We run Equation 2 using *total* compensation as the dependent variable. In untabulated results, we continue to find a negative and significant coefficient on ΔGWI, leading us to conclude that the reduction in cash compensation is not totally made up by other components (options, restricted stock, and other forms) of compensation.

Alternative Specifications

We examine the alternative explanations for our empirical results. We first explore whether change in the dependent variable is not driven by ΔGWI but rather by variables that are omitted in our specifications. In particular, in our specifications, we assume that pay-performance sensitivities (with respect to *ROA* and *RET*) are constant across firms. The sensitivities may vary across firms. If, in addition, they are correlated to ΔGWI, then the estimates of the coefficient on ΔGWI may be biased because of the omitted variables. We investigate three possible scenarios in which the pay-performance sensitivities differ across firms with different characteristics: (a) earnings volatility, (b) growth, and (c) tenure. We expect that the pay-performance sensitivities are smaller for firms with more volatile earnings than those with more stable earnings. To the extent that CEOs are risk-averse, lower sensitivities reduce the adverse effect of earnings volatility inherent to their firms. Second, prior literature (Gaver & Gaver, 1995; Lambert & Larcker, 1987; Yermack, 1995) predict that growth firms rely more on equity based than earnings-based compensation relative to non-growth firms. This implies the sensitivity of pay-*RET* (pay-*ROA*) relation should be higher (lower) for growth firms relative to non-growth firms. Literature on career concerns (Gibbons & Murphy, 1992), however, predicts that pay-performance sensitivity increases as CEOs' tenure increases. To examine whether the differential pay-performance sensitivities are biasing the coefficient on ΔGWI, we re-run our regressions after adding interactive terms between ΔROA (*RET*) and the measures of firm-specific earnings volatility, market-to-book proxying growth, and high tenure. Untabulated results show that even after controlling for these potentially omitted variables, the coefficient on ΔGWI remains negative; inferences remain the same.

Concluding Remarks

Motivated by the well-documented agency issues surrounding M&As, we address the question of whether compensation committees incorporate acquisition-related managerial

performance, as reflected in goodwill impairment losses, into CEO compensation. Impairment testing under SFAS 142 requires firms to evaluate the economic value of goodwill and report impairment losses when the fair value of acquired units deteriorates, in essence, when past acquisitions go sour.

As compensation is an instrument to incentivize CEOs to make optimal decisions, the compensation committees need to balance (a) effort aversion and (b) risk aversion of CEOs. Without penalty for poor acquisitions, CEOs may pursue a reckless shopping spree to build an empire. However, if the penalty is very severe, CEOs will be reluctant to purse risky acquisitions. We find that there is a significant reduction in cash- and option-based CEO compensation as firms recognize goodwill impairment losses. Although total compensation is reduced, it appears that compensation committees alter the composition of compensation to realign the risk-taking incentives of CEOs. In addition, we find that there are significant cross-sectional differences. We reiterate the major findings below.

First, we find that the reduction in option-based compensation following the recognition of goodwill impairment losses is significantly higher for CEOs in firms that are not R&D intensive. In fact, CEOs in firms that are R&D intensive appear to be shielded from goodwill impairment losses in terms of option-based compensation. However, we find that CEOs in both R&D intensive firms and non-R&D intensive firms see significant reduction in their cash compensation. Therefore, our finding suggests that CEOs of R&D intensive firms are shielded from a negative effect of goodwill impairment losses in the area of option compensation. As goodwill impairment is bad news for the reporting firms, we interpret this differential sensitivity as the compensation committee's way of encouraging CEOs to take risks through acquisitions in firms where risk taking is more important.

Second, CEOs who have acquired larger targets, compared with those who have acquired smaller targets in their recent acquisitions experience more reduction in their cash compensation. Impairment is more likely to be an outcome of suboptimal decisions made at the time of acquisition. Although acquisitions and impairments are sunk costs, adverse consequences inflicted on CEOs are likely to discipline them in future acquisitions. Third, we find that CEOs with a long tenure are shielded from the negative consequences of goodwill impairment losses on their cash compensation. This is consistent with the notion that incremental information contained from goodwill impairment is less valuable as a CEO's tenure lengthens. These CEOs likely have a long track record with superior performance. However, these CEOs may be shielded because they amassed power over their board over time (CEO entrenchment). Although this is not our main research question of interest, comparison of industry adjusted *ROA* shows (untabulated) that CEOs with a long tenure have *ROA* at least as good as those with a shorter tenure. That seems to contradict the possibility that these CEOs have captured their boards to ensure their job security (Hermalin & Weisbach, 2003).

The differential treatment of options and restricted stock is particularly interesting. While academic research tends to aggregate options and restricted stock as equity-based compensation, our results show that compensation committees seem to differentiate them. When goodwill is found to be impaired, compensation committees appear to restructure compensation to reduce the risk-taking incentives. Our results are consistent with the notion that option compensation is more efficient in inducing CEOs to take the optimal level of risky investments (Bryan et al., 2000) and the market differentiates the incentive effects of option and restricted stock grants (Irving, Landsman, & Lindsey, 2011). Thus, restructuring of CEO compensation is implemented mainly through reducing option compensation rather than restricted stock.[11]

We also conduct a number of additional analyses to provide a richer and more complete picture on how compensation committees incorporate goodwill impairment losses into CEO compensation. All in all, we find that compensation committees appear to use goodwill impairment losses to realign CEOs' incentives to motivate them to take appropriate risks.

We contribute to the stream of literature on the determinants of CEO compensation, especially on the role of ''transitory'' reductions from net income. Goodwill impairment, however, is different from other charges in several aspects. First, it arises only from past acquisition activities. Had a firm pursued an organic growth strategy, a goodwill impairment cannot arise even though impairment of identifiable tangible and intangible assets can occur. Second, goodwill impairment loss is a non-cash charge. Thus, we do not expect necessarily the same results from restructuring charges or other special items. We also contribute to the stream of literature that examines the consequences borne by executives who destroy firm value with acquisitions. Our results are consistent with the notion that compensation committees, on average, do penalize CEOs for poor acquisition-related performance by reducing their compensation. CEOs who end up impairing goodwill are penalized because they are viewed as having made poor acquisitions and/or managed post-acquisition operations poorly. However, the severity of penalty is not uniform across firms. Overall, we find that the compensation committees determine compensation to balance, on one hand, the need to incentivize CEOs to make risky investments (such as R&D), and on the other hand, the need to curb excessive investments (such as the executives' tendency to build empire).

Author's Note

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Notes

1. Consistent with prior literature (i.e., Adut, Cready, & Lopez, 2003), ''shielding'' occurs when compensation committees add the goodwill impairment losses back to accounting income before determining executives' compensation. If compensation committees shield CEOs' compensation

from goodwill impairment losses, then there would be no association between the change in goodwill impairment losses and the change in components of executive compensation.

2. For example, the *New York Times* article by Healy (2009) cites Rex S. Schuette, the Chief Financial Officer (CFO) of United Community Banks, stating that ''it was *just a paper entry* sitting on your balance sheet'' when referring to his company's US$70 million write-off of goodwill in the first quarter of 2009.

3. Using a sample of 634 firms over the period 2001-2010, Brown, Davis-Friday, and Guler (2014) document that firms that experienced goodwill impairment losses are more likely to formally adopt clawback provisions in executive compensation contracts. This finding suggests that compensation committees are concerned with large goodwill impairment losses and may take actions against those CEOs, ex post, who have engaged in poor acquisitions. In contrast, our article examines whether compensation committees adjust compensation downward without formal clawback provisions by investigating the association between the change in goodwill impairment losses and the change in components of executive compensation. Examining whether and how firms claw back acquisition-specific bonuses is not within the scope of our article for the reasons explained in Note 5.

4. It is possible that the compensation committees might be taking ''the overallocated goodwill'' documented by Shalev, Zhang, and Zhang (2013) into account when they evaluate the impact of goodwill impairment losses on the CEOs, and they might reduce the compensation of the CEOs who overallocated the purchase price to goodwill at the time of acquisition more relative to those who do not overallocate. It would be interesting to do this additional analysis, however when we attempt this, we are not able to reach at a meaningful sample size, as this requires us to track back acquisitions and pair them with the subsequent goodwill impairment charges. Firms typically do not provide explicit disclosures as to the source of impairment; therefore, there are very few instances where a specific CEO who reports the goodwill impairment can be matched with specific acquisitions in the past.

5. According to Financial Accounting Standards Board (FASB) guidelines, interim testing between annual tests is necessary if there is (a) market decline, (b) a regulatory action concerning the company's business, (c) a change in legal environment that impacts the company, (d) unexpected competition, (e) loss of key personnel, (f) expectation to sell or dispose a reporting unit.

6. We do not use acquisition premium for three reasons. First, high premium is not necessarily an indication of aggressive acquisition behavior. High premiums may have been necessary to conclude acquisitions and may not capture the overpayment for targets over and above the value of the targets to the acquirer. Second, in estimating a prediction model for future goodwill impairment, Olante (2013) finds that premium is not statistically significant. Third, premium is available for only one fifth of our sample firms.

7. An additional test of the first hypothesis would be to track major acquisitions and impairment decisions by CEO-firm combination. Some CEOs are given special bonuses (and/or options) at the time of acquisition and when their goodwill is impaired in the future, their bonuses (and/or options) could be clawed back. We attempted to track the past acquisitions in relation to impairment decisions. We found that we cannot arrive at a meaningful sample size (less than 10 observations) because (a) only 26% of companies with goodwill impairments identify which past acquisitions had their goodwill impaired in their financial reports (10-Ks); and (b) only few companies disclose the amount of bonuses awarded to their CEO around the time of the acquisitions identified in (a).

8. Based on the acquisitions that took place between 1988 and 1998, Hayn and Hughes (2006) find that goodwill write-offs occur on average 4 to 5 years after the acquisitions. Olante (2013) find that the lag impairment write-offs is shorter in the more recent period.

9. Related to this, we also examine whether the CEOs are more severely penalized for goodwill impairment losses if they have delayed the recognition of goodwill impairment losses. We use an indicator variable for firms that report ''delayed'' goodwill impairment charges. Consistent

with Beatty and Weber (2006), we denote the firm as delayed if their market value of equity is less than their book value of equity. We then interact this indicator variable with our main variable of interest ΔGWI to allow the coefficient on the ΔGWI to differ according to whether firms delay the impairment losses, and run Equation 1. We do not find any statistical significance on the interaction term (untabulated), consistent with the notion that compensation committees do not seem to differentiate between goodwill impairments reported with delay and goodwill impairment charge reported on a timely basis when they determine the CEOs' compensation.

10. Specifically, when using the log of change in cash compensation as the dependent variable, we find that for the CEOs who are not the chair of their firms' boards, there is a reduction in CEO cash compensation in response to ΔGWI as indicated by the statistically significant coefficient estimate of -0.410 (p value of .001) for ΔGWI. However, CEO–chairs' cash compensation is not significantly reduced as given by the coefficient estimate of -0.042 and p value of .778 for $\Delta GWI + \Delta GWI \times CHAIR$.

11. We should note that SFAS 123R, which became effective in 2006, did reduce the advantage of stock options over restricted stock and many firms reduced options and increased restricted stock. This effect, however, should be controlled for, to some extent, by the inclusion of year effects.

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