Does Writing Down Goodwill Imperil a CEO's Job?

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1. Introduction

In this research, we investigate whether boards use recognized goodwill impairment charges as indicators of chief executive officer (CEO) underperformance in managing mergers and acquisition (M&A), leading to CEO turnover. Mergers and acquisitions can destroy substantial amounts of acquiring shareholder wealth (Moeller, Schlingemann and Stulz, 2004). CEOs are critical in selecting, negotiating, and integrating M&As, but researchers have rarely studied the effects of M&A performance on CEO turnover. A notable exception is Lehn and Zhao (2006), who report that firms that suffer greater shareholder wealth losses at and following acquisition announcements are more likely to replace their CEOs within five years. More than half of the CEO turnovers cannot be explained by the acquirer going bankrupt or being taken over. Lehn and Zhao argue that their results provide evidence that internal governance punishes managers who make acquisitions that destroy value.

Lehn and Zhao (2006) emphasize the stock-price reaction to an M&A announcement as the key indicator of the value created or destroyed by the deal. However, other studies argue that acquirer announcement stock-price reactions can be incomplete due to distortions from arbitrage trading (Mitchell, Pulvino and Stafford, 2004), limited investor attention (Hirshleifer and Teoh, 2003; Oler, 2008), or the acquirer's unanticipated difficulty in subsequently integrating the target (Hoberg and Phillips, 2018). Few studies examine the extent to which CEO replacements are a function of ex post information about M&A performance. Neither long-run stock-price performance nor overall accounting performance measures can clearly isolate the M&A effect from other influences on firm performance over the years following the transaction (Renneboog and Vansteenkiste, 2019).

A related issue is when and how the board learns that a CEO's M&A-related performance is unacceptable. Jenter and Lewellen (2017) report evidence that boards are slow to learn about CEO performance; the sensitivity of the board's beliefs to new performance signals declines slowly, suggesting that boards are unable to figure out CEO ability even after observing performance for many years. The authors remark that "negative signals need to accumulate before a CEO is replaced". The findings imply that early indications of the CEO's M&A-related performance including the stock-price reaction to the deal announcement, and early post-announcement stock and operating performance, do not trigger a CEO replacement by themselves.

Historically, publicly observable M&A-specific performance indicators were not regularly available. However, an overhaul of merger accounting standards in 2001 mandated that firms regularly evaluate merger goodwill for impairment and write down its value when the fair value of goodwill declines because there is a deterioration in the capabilities of the acquired net assets to generate expected future cash flows. The resulting impairment charges appear on the income statement, providing an observable indicator of the degree to which an M&A transaction has failed to create the value originally expected.

Several studies give us reason to expect that boards do not rely solely on stock price-based indicators, such as those investigated by Lehn and Zhao (2006), of poor CEO performance in making turnover decisions. Bond, Goldstein and Prescott (2009) develop a rational expectations model in which security prices reflect information about both firm fundamentals and expectations of corrective actions by agents. They show that nonmarket sources of information are important complements to security prices for agents (such as boards) to use in deciding on an intervention (such as replacing a CEO). Arya, Mittendorf, and Ramanan (2017) also provide theoretical support for the idea that accounting reports help decision makers understand the implications of

information embedded in stock prices. Several empirical studies find that accounting-based measures of firm performance are associated with CEO turnover while controlling for stock-price performance (e.g., Weisbach, 1988; Murphy and Zimmerman, 1993; Engle, Hayes, and Wang, 2003; Kaplan and Minton, 2012; Ghosh and Wang, 2019).

The measurement of a goodwill impairment is based on firm expectations about future performance and cash flows; an impairment implies that the firm no longer expects future cash flows to meet prior expectations. Research indicates that goodwill impairment is informative to board compensation committees and market participants . For example, impairment charge announcements are associated with negative stock returns (Bens, Heltzer and Segal, 2011; Chen, Kohlbeck and Warfield, 2008; Li et al., 2011) and often followed by downward revisions of analyst forecasts (Li et al., 2011). Gu and Lev (2011) argue that goodwill impairment charges are related to overpriced acquirer equity at the time of the transaction. Darrough, Guler, and Wang (2014) find that goodwill impairment losses are negatively associated with cash- and option-based CEO compensation. The compensation contract sets up an incentive mechanism determined by the association between pay and performance. However, boards' turnover decisions likely reflect a broader set of concerns than compensation decisions (Engel, Hayes and Wang, 2003). CEO turnover can also be driven by the board's conclusion that the CEO's ability is low, or the CEO's skills are not well matched to the firm's need.

The process for testing goodwill for impairment is both technically challenging and subject to misaligned incentives (Ayres et al., 2019b). Management would likely prefer to avoid recognition of an impairment charge, while auditors should be skeptical and seek to minimize biases in impairment testing. The misaligned incentives can create tension in the audit process, which, particularly when faced with a proposed write-down that is material, is likely to involve

the audit committee of the board (McCracken, Salterio, and Gibbins, 2008). Therefore, an impairment charge is likely to become salient to the board before the financial statements are released publicly, with the impairment recognition decision potentially being finalized during the audit period.

Anecdotal evidence suggests a link between the recognition of goodwill impairment and management turnover. For example, AOL's acquisition of Time Warner in 2001 resulted in a $54 billion goodwill write-down in 2002; in January 2003 CEO Stephen Case resigned his position as chairperson. Similarly, Avon recognized a goodwill write-down of $263 million in the fourth quarter of 2011. The previous quarter, Avon had announced that Andrea Jung, who had held the roles of both CEO and chairperson of the board since 1999, would no longer serve as CEO. However, prior research has not investigated whether goodwill impairment charges affect the probability of terminating a CEO responsible for an acquisition decision preceding the impairment.

We examine 5,990 firm-years of CEO retention decisions from 2002–2016. Each firm executed at least one M&A transaction between 1997 and 2016. Among the CEOs who led the firms at the time of the transactions, 473 experienced a forced turnover, and 207 departed due to death, personal health, or retirement, which we identify as voluntary turnover. Logistic regression results show that the recognition and magnitude of goodwill impairment in the two fiscal years prior to the focal year are positively associated with forced CEO turnover, but not with voluntary turnover. Additional tests ease any concern that the goodwill impairment charges could represent a "big bath" taken by new CEOs.

When we control for market reactions around prior acquisition announcements, the association between goodwill impairment and forced CEO turnovers is still significant. This result supports the hypothesis that boards perceive goodwill impairment charges as new information

about CEO performance, reflecting a failure to realize the value expected from the acquisition. We partition goodwill impairment charges into expected and unexpected components, and find that only the unexpected component of goodwill impairment is informative and associated with forced CEO turnover. When we examine how audit quality affects the goodwill impairment and CEO turnovers, we find the positive association between the goodwill impairment and CEO turnover is only significant for companies that are audited by Big 4 (Big 5) auditors, suggesting accounting quality plays a role in boards' decisions.

This paper contributes to both the CEO turnover literature and the asset write-off literature, as well as providing new evidence to standard setters. The literature on CEO turnovers consistently reports a negative association between CEO turnover and stock returns, broad accounting performance, or both (e.g., Coughlan and Schmidt, 1985; Murphy and Zimmerman, 1993; Mikkelson and Partch, 1997). However, these performance measures can be influenced by many factors including some that are not controllable by CEOs (Kaplan and Minton, 2012; Jenter and Kanaan, 2015). Theoretical literature on CEO dismissal decisions suggests that corporate boards learn from other indicators of CEO quality (Hirshleifer and Thakor, 1994, 1998; Warther, 1998). Our finding that the need to recognize a goodwill impairment conveys new information to the board about the quality of CEOs adds to the evidence on the use of such other indicators.

Second, our paper adds to the asset write-off literature. Prior literature finds that asset write-offs and write-downs are value relevant and negatively associated with stock returns (Francis, Hanna and Vincent, 1996; Alciator, Easton and Spear, 2000; Chen, Kohlbeck and Warfield, 2008; Li et al., 2011). However, the informativeness of reported goodwill balances and impairment charges is controversial. Li and Sloan (2017) find that goodwill impairment charges are less informative in the post-SFAS 142 period and posit that impairments have become less timely and

more predictable. Francis, Hanna and Vincent (1996) and Riedl (2004) report that CEO turnover precedes goodwill impairment. They find new CEOs are likely to "take a big bath," that is, record higher asset impairment charges that investors and boards could attribute to the former CEO's performance. We provide new insight on this issue by documenting a positive association between goodwill impairment and CEO turnovers. We also show that goodwill impairment charges are greater before forced versus voluntary CEO departures.

Third, our study responds to the FASB's current project on the costs and benefits of current goodwill impairment rules. The FASB's stated goal is to improve the decision usefulness of goodwill reporting (FASB, 2019b). The FASB may eliminate impairment testing on an annual basis (FASB, 2019a) and reintroduce a less costly procedure, goodwill amortization, because "some users explained that impairments do not provide meaningful information" (FASB, 2019a, page 7) Our findings imply that boards use goodwill impairment charges to evaluate CEO performance and make CEO retention decisions. In contrast, the annual goodwill amortization can't alert boards about the underperformance of merger and acquisition transactions.

2. Goodwill Accounting Background

Before 2001, goodwill was required to be amortized over its useful life, not to exceed 40 years. In 2001, the FASB issued SFAS 142, which introduced the present accounting model for goodwill. At the date of an acquisition, goodwill is an asset generally measured as the excess of the fair value of the consideration paid over the fair value of net identifiable assets (ASC 805-30-30-01). Subsequently, firms are required to use a two-step process to recalculate the implied fair value of goodwill annually and record, if necessary, a charge against earnings for any reduction in value (ASC 350-30-35-11). In 2017, to reduce the preparation cost by simplifying the goodwill impairment test, the FASB issued ASU No. 2017-04, whichremoved step two of the goodwill

impairment test (FASB, 2017). Step two involves estimating the implied fair value of goodwill, which requires allocating the estimated fair value of a reporting unit to individual assets and liabilities within the reporting unit. The ASU requires only step one of the goodwill impairment test, which compares the fair value of a reporting unit with its carrying value, including goodwill. In October of 2019, in response to stakeholder concerns about the cost to perform the goodwill impairment test, the FASB announced that it is revisiting the subsequent accounting for goodwill and invited comments from stakeholders on the costs and benefits of current goodwill accounting.

Theoretically, the fair market value of goodwill should reflect the present value of projected cash flow increases of a business entity expected to result from the acquisition. In practice, goodwill could come from acquired intangible assets that do not have a specifically identified value, overvaluation of the consideration paid by the acquirer, over (or under) payment by the acquirer, or any combination thereof. Errors in valuing the acquisition can make realizing the expected value of the acquisition less likely (Johnson and Petrone, 1998). After the acquisition, to the extent that the present value of expected future cash flows from the acquired assets falls short of original projections, goodwill is impaired. An impairment could result from unanticipated changes in the industry or economy, or from suboptimal management decisions at the time of the acquisition or later.

3. Related Literature

Research evidence indicates that goodwill accounting under the impairment model is informative to market participants. Impairment charge announcements are associated with negative stock-price reactions (Bens, Heltzer and Segal, 2011; Chen, Kohlbeck and Warfield, 2008; Li et al., 2011) and often followed by downward revisions of analyst forecasts (Li et al., 2011). Lee (2011) reports that goodwill has become more useful in predicting future cash flows under the

impairment model than under the previous requirement that goodwill be amortized and expensed over a 40-year life. Sun (2016), using a measure of managerial ability from Demerjian, Lev and McVay (2012), finds that higher-ability managers are less likely to have goodwill impairment losses. Higher-ability managers also incur smaller losses when they do have impaired goodwill.

Some authors suggest that the impairment model of accounting for goodwill offers firms excessive discretion, creating a risk that firms could manipulate the timing of charges in response to ulterior incentives at the expense of providing up-to-date information to investors. When the accounting change that required impairment testing rather than amortization went into effect, firms could make a one-time choice to write off goodwill "below the line" without affecting income from current operations. Beatty and Weber (2006) find that firms facing this one-time choice were influenced by expected effects on stock-price reactions, managerial bonus plans, and debt covenants. Shalev, Zhang and Zhang (2013) find that at the time of an acquisition, managers with compensation packages that rely heavily on accounting earnings-based bonuses over-allocate the acquisition price to goodwill. Ramanna and Watts (2012) report empirical support for their argument that the opacity of the testing process introduced by SFAS 142 lets managers delay recognizing impairment. Similarly, Li and Sloan (2017) present evidence consistent with overstated goodwill and delayed goodwill impairments under the SFAS 142 procedures. The authors find that stock prices do not fully impound the negative information in future, delayed goodwill impairments, implying that managers can temporarily create overvalued shares by postponing charges. Some financial statement users suggest that goodwill testing and related impairments are confirmative, rather than predictive (KPMG, 2014).

Lehn and Zhao (2006) examine a sample of firms that made acquisitions from 1990 through 1998. They use market reactions and subsequent stock-price performance to identify value-

destroying acquisition decisions, which implicitly lead to future CEO firings. Specifically, they find that firms with more negative stock-price reactions to acquisition announcements are more likely to experience CEO turnovers in the subsequent five years. Lehn and Zhao argue that their results provide evidence that internal governance punishes managers who make acquisitions that destroy value. Our paper differs from theirs in that we investigate whether goodwill impairment charges, determined under procedures instituted after the end of their sample period, provide additional acquisition-specific information that boards use in deciding to replace CEOs.

Gu and Lev (2011) report an association between the use of overvalued stock to pay for imprudent acquisitions and subsequent goodwill impairment charges. The authors find that post-acquisition, pre-impairment-announcement stock returns have predictive power for impairment charges. Even so, we argue that the stock price before the recognition of impairment may not fully capture the economic loss revealed by the write-off. Alternatively, a goodwill impairment charge could embody information previously available but be a more salient or more interpretable performance indicator for board action because of its acquisition-specific nature and the requirement that the goodwill asset be evaluated for impairment at least annually. As Gu and Lev (2011) observe, a goodwill impairment charge is "an important business event signaling a flawed investment strategy."

Agency theory predicts that firms' corporate governance mechanisms discipline managers and direct them to focus on creating value (Fama and Jensen, 1983). Numerous studies report that CEO dismissals are sensitive to firm stock-price performance (e.g., Weisbach, 1988; Huson, Parino and Starks, 2001; Bushman, Dai and Wang, 2010; Kaplan and Minton, 2012), accounting measures of performance (e.g., Farrell and Whidbee, 2003; Huson, Malatesta and Parrino, 2004), or both (e.g., Weisbach, 1988; Murphy and Zimmerman, 1993; Engle, Hayes and Wang, 2003;

Kaplan and Minton, 2012; Ghosh and Wang, 2019). No research to date examines whether boards use goodwill impairment information in managerial retention decisions.[1] Darrough, Guler and Wang (2014) study the compensation committee's response to goodwill impairment losses and find negative associations between goodwill impairment and both cash and option-based compensation. Whereas they analyze the compensation of CEOs who remain, we examine the more momentous decision faced by the board of whether to replace the CEO. Our paper also differs from theirs in that our empirical design is based on tracking the mergers and acquisitions during a CEO's tenure, allowing us to control for the number and pricing of acquisitions under that individual's leadership.

4. Hypothesis Development

Initiating mergers and acquisitions and overseeing their progress are considered CEOs' major responsibilities. CEOs are critical in selecting, negotiating, and integrating M&As, and failed M&As can destroy substantial amounts of acquiring shareholder wealth (Moeller, Schlingemann and Stulz, 2004). Impairment charges imply a deterioration in the ability of the acquisition to generate expected future cash flows and indicate an M&A that failed to meet performance expectations. Because of their leadership role in M&A decisions, CEOs are likely to be held responsible for the value loss. To the extent that the determination of the existence and materiality of the impairment charge contains new information about the CEOs M&A underperformance, we expect that it conveys new information about the CEO's M&A performance to the board. First, the goodwill impairment charge presents the board with additional information

[1] Masters-Stout, Costigan and Lovata (2008) and Glaum, Landsman and Wyrwa (2018) report that a goodwill impairment is more likely in the first year of a CEO's tenure. Beatty and Weber (2006) find that a goodwill impairment is more likely the shorter the time the CEO has been in the position. Unlike our paper, none of these studies investigates the relation between a goodwill impairment charge and a *subsequent* change in CEO.

about any overpayment at the acquisition date, subsequent failure to realize expected cash flows by integrating the target, or both. Both the initial overpayment for an acquisition and the subsequent failure to realize expected synergies are directly related to the CEO's ability and judgments. Second, goodwill impairment charges lead to negative stock-price reactions (Bens, Heltzer and Segal, 2011; Chen, Kohlbeck and Warfield, 2008; Li et al., 2011) and downward revisions of analyst forecasts (Li et al., 2011), which bring extra pressure on the board to reassess the CEO's performance and review its CEO retention decision. This leads to our first hypothesis:

> HYPOTHESIS 1. *Goodwill impairment following M&A deals selected and managed by a CEO is positively associated with the probability of a forced replacement of the CEO.*

As several authors point out, there is substantial discretion in the measurement and timing of recognizing goodwill impairment (Beatty and Weber, 2006; Ramanna and Watts, 2012; Li and Sloan, 2017). Management has insider knowledge about the need for and the magnitude of possible impairment charges. However, the board and market participants such as analysts also use available information to make independent predictions of the market value of the entity, and declines in their expectations of market value may signal possible goodwill impairments (Ayres et al., 2019a). The eventual recognition of goodwill impairment potentially could be anticipated by market participants, such that the market reaction to impairment could be fully impounded in the stock price. If so, the recognition of an impairment charge on the income statement would provide no new information. However, if the goodwill impairment is taken unexpectedly or at an amount that is larger than the market expectation, the disclosure of the impairment loss conveys new information to the market and the board. Therefore, any unexpected component of a goodwill impairment charge is more likely to be associated with forced CEO turnover than the expected portion. This leads to our second hypothesis:

HYPOTHESIS 2. *Unexpected goodwill impairment following M&A deals selected and managed by a CEO is more positively associated with the probability of a forced replacement of the CEO than an expected goodwill impairment.*

Previous literature provides evidence of the impact of market intermediaries on financial reporting quality. Higher perceived audit quality, which is associated with a Big 4 audit, is also associated with higher financial reporting quality, as indicated by lower discretionary accruals, a higher earnings response coefficient, and a lower cost of equity capital (e.g. Becker et al., 1998; Krishnan, 2003; Khurana and Raman, 2004). Analysts also perform a monitoring role with respect to financial reporting quality, as shown by prior studies on their effects on discretionary accruals (Yu, 2008; Chen et al., 2015), accounting conservatism (Sun and Liu, 2011), and real earnings management (Duellman, Ahmed, and Abdel-Meguid, 2013). Ayres et al. (2019a) find that analyst coverage affects goodwill impairment decisions. We expect that the goodwill impairment recognized by companies with higher audit quality and who have a greater number of analysts following them are more reliable and informative. Boards are expected to have a stronger reaction to these impairment disclosures. Our third set of hypotheses is:

HYPOTHESIS 3a. *Goodwill impairment following M&A deals selected and managed by a CEO is more positively associated with the probability of a forced replacement of the CEO for companies audited by Big 4(5) auditors than for companies audited by non-Big 4(5) auditors.*

HYPOTHESIS 3b. *Goodwill impairment following M&A deals selected and managed by a CEO is more positively associated with the probability of a forced replacement of the CEO for companies followed by more analysts than for companies followed by fewer analysts.*

5. Sample and Research Model

Sample

To form our sample of CEOs who completed at least one acquisitions during their tenure, we first search for mergers and acquisitions in Thomson One Banker completed from 1997 to

2016.[2] Our tests use firm-years starting in 2002, since SFAS 142 took effect on June 30, 2001[3]. We require the acquirer to be listed on the New York Stock Exchange (NYSE), Nasdaq, or American Stock Exchange (AMEX), with a market value of at least $100 million four weeks before the transaction. We exclude acquirers in the financial and utility sectors and consider only deals with value at least 10 percent of the acquirer's prior market value, leaving 4,973 merger and acquisition events from 2,343 unique acquirers. We identify the CEO at the time of acquisition using Compustat Execucomp. We obtain financial statement data from Compustat, stock market data from CRSP, and analyst following from I/B/E/S. We track the acquirer until the CEO departs, the firm is delisted, or the end of 2016, whichever is later. We delete firm-years with prior zero goodwill because a goodwill impairment charge is impossible. Our final sample includes 5,990 firm-year observations. Table 1 presents details of the sample selection procedure Table 1.

Empirical Model

To test the association between goodwill impairments and forced CEO turnover, we estimate the following logistic regression:

$$\begin{aligned} Prob\,(FORCED_t) = {} & b_0 + b_1 GWIP_{t-1}\,[GWIPDUM_{t-1}] + b_2 LNAT_{t-1} + b_3 GW_{t-1} + b_4 BHAR_{t-1} + \\ & b_5 ROA_{t-1} + b_6 LEV_{t-1} + b_7 BTM_{t-1} + b_8 LNAGE_{t-1} + b_9 LNTENURE_{t-1} + b_{10} CHAIR_{t-1} \\ & + b_{11} FOUNDER_{t-1} + b_{12} SHROWN_{t-1} + b_{13} BIGAUD_{t-1} + b_{14} LNANALYST_{t-1} + \\ & Industry\ fixed\ effect + Year\ fixed\ effect. \end{aligned} \quad (1)$$

The dependent variable is *FORCED*, an indicator variable equal to one when the CEO is forced to step down and zero in all other cases (CEO continuations and voluntary departures). To identify forced CEO departures, we use the approach of Parrino (1997), as do most studies of managerial turnover in the past two decades (e.g., Farrell and Whidbee, 2003; Berry et al., 2006; Lehn and Zhao, 2006; Guo and Masulis, 2015; Kang, 2018). We search for information about each

[2] Thomson One Banker is another interface to the same data as the widely cited SDC Platinum.

[3] We require acquisition data from 1997 to include acquisitions identified 5 years prior to the first sample year (2002).

CEO departure in SEC 8-K fillings and the Lexis-Nexis news database. If there is no related 8-K filing or news story, we examine the CEO information in the firm's proxy statements and 10-K filings. The departure of a CEO is classified as forced if we find no report that the turnover is due to death, poor health, the acceptance of another position, or retirement, and the CEO is younger than 65.[4]

Our variable of interest measures the goodwill impairment charges in the two years preceding the year of a potential CEO turnover. *GWIP* is the annual goodwill impairment charge (as a nonnegative number) scaled by the book value of total assets at the beginning of the year, summed over the two fiscal years preceding the fiscal year in which we measure *FORCED*. *GWIPDUM* is equal to one if there is a goodwill impairment charge in the two-year period, and zero otherwise. The potential to impair goodwill depends on the amount of goodwill on the balance sheet at the beginning of the year, *GW*, which is included in the regressions.

We control for firm characteristics that are known to be correlated with CEO turnover, including firm size, performance, growth opportunities, risk (financial stress), CEO characteristics, and the firm's information environment. Firm size is represented by the log of total assets (*LNAT*) at the beginning of the year. The firm performance measures are *BHAR*, the market-adjusted buy-and-hold abnormal return during the preceding fiscal-year, and return on assets (*ROA*), measured as income before goodwill impairment and extraordinary items and scaled by total assets at the beginning of the year.

The book-to-market equity ratio (*BTM)* and the leverage ratio (total liabilities divided by total assets, *LEV*) are our growth opportunity and risk measures, respectively. CEO characteristics include *LNAGE*, the log of the CEO's age; *CHAIR*, equal to one if the CEO is the chairman of the

[4] To reduce the risk of misclassification, we also try including as forced departures those where retirement is the stated reason and the CEO is younger than 60. This reclassification does not affect our conclusion.

board; *FOUNDER*, equal to one if the CEO is the founder of the firm; *LNTENURE*, the log of the number of years that the CEO has held the position; and *SHROWN*, the number of shares held by the CEO as the percentage of total shares outstanding. The information environment variables are based on auditor quality and analyst coverage. *BIGAUD* equals one if a firm's auditor is one of the Big 4 (Big 5 before Arthur Andersen LLP's collapse), and zero otherwise. *LNANALYST* is equal to the log of the number of analysts providing earnings forecasts for the firm. In addition, industry and year fixed effects are included to control for any unknown correlation within each industry or each year.[5]

6. Results

Descriptive Results

Panel A of Table 1 reports summary statistics for the full sample. It shows that 7.9 percent of sample firm-years include a forced CEO turnover. The average two-year-period goodwill impairment charge is 1.5 percent of firm assets, with about one in five firm-periods including at least one nonzero goodwill impairment charge. The average total assets (untabulated) is $2.307 billion and the average log total assets is about $7.7 million. Starting goodwill is, on average, 20 percent of total assets. The average buy-and-hold one-year average abnormal return is 6.3 percent and the average *ROA* is 4.5 percent. The mean CEO age and tenure are 56 and seven years, respectively. More than half of CEOs also hold the position of board chair; 5 percent of CEOs founded the firm. Big 4 (5) auditors audit 69 percent of the companies, and the mean number of analysts covering the firm (untabulated) is seven, with the mean of log analysts being 1.9.

[5] Industry groupings are based on SIC codes: Agricultural, mining & construction = 0−1999; Manufacturing = 2000−3999 (excluding SIC codes counted in Technology); Technology = 3570−3579 and 7370−7379; Transportation = 4000−4799; Communications = 4800−4899; Utilities = 4900−4999; Wholesale and Retail = 5000−5999; Services = 7000−8999 (excluding SIC codes counted in Technology).

Panel B of Table 1 compares firm-years with and without a forced CEO turnover. Forced CEO changes are preceded by larger and more frequent goodwill impairment charges than firm-years without CEO changes or with voluntary changes, with a mean of 2.3 percent versus 1.4 percent of total assets and frequency of 27.9 percent versus 19.7 percent. Firms with forced turnovers are larger and have more goodwill relative to total assets. Stock-price performance is significantly worse in the forced-turnover subsample, with a mean *BHAR of* –4.8 percent versus +7.2 percent. Similarly, *ROA* averages 3.5 percent preceding forced turnover firm-years versus 4.6 percent otherwise. Leverage and book-to-market ratios do not differ significantly between the subsamples. CEOs forced out are slightly older than those remaining in place or leaving voluntarily, with mean log values corresponding to 58 versus 56 years old. CEOs forced out have been in place for a mean 7.9 years, compared with 7.2 years for CEOs in other firm-years. There is no difference between subsamples for firms based on whether the CEO chairs the board or is the founder of the company. The share ownership of CEOs forced out is significantly less than the ownership of non-forced CEOs, 1.2 percent versus 2.1 percent of total shares outstanding. Auditor quality and analyst coverage do not differ significantly between forced turnover years and other years..

Table 2 presents pairwise Pearson correlation coefficients among the variables. Forced CEO turnover is significantly associated, at the 1% level, with the recognition and magnitude of goodwill impairment, larger size of assets and goodwill, worse firm performance as represented by a smaller buy-and-hold return or smaller *ROA*, greater CEO age and CEO tenure, and smaller CEO ownership. The largest correlations among right-hand-side variables are between *LNAT* and *LEV* (0.345), and between *LNAGE* and *LNTENURE* (0.339). All other pairwise correlations of explanatory and control variables are below 0.30 in absolute value.

Main Results

Table 3 presents the main logistic regression results. Model (1), the main estimate of equation (1), uses the full sample of firm-years with a forced CEO turnover (*FORCED* = 1) or a voluntary turnover or no CEO change (*FORCED* = 0). Hypothesis 1 predicts that if the magnitude of goodwill impairment informs the board about CEO under performance in M&A selection and integration, the coefficient on *GWIP* will be positive and significant. Consistent with the hypothesis, the coefficient of *GWIP* in model (1) is 2.825, statistically significant at the 1 % level. The marginal effect of *GWIP* (not tabulated) is 0.197. Thus, for a one-standard-deviation increase of *GWIP* (0.053), the unconditional probability of forced turnover increases by 1.0 percent. Relative to the overall sample forced turnover rate of 7.9 percent, goodwill impairment has an economically significant association with CEO replacement. The associations between control variables and CEO turnover are generally consistent with prior studies (e.g., Parrino, 1997; Lehn and Zhao, 2006; Fee, Hadlock and Pierce, 2013). The probability of CEO turnover is higher for firms with larger assets and goodwill, for those with poor performance (both stock- and accounting-based), and for those with less analyst coverage. CEOs who are older, who hold fewer shares, and who do not chair the board are more likely to be fired.

Table 3, model (2) is similar to model (1) except that the dichotomous variable *GWIPDUM* replaces *GWIP* to test whether the occurrence of goodwill impairment, without consideration of the magnitude of impairment, leads to involuntary CEO turnover. The coefficient of *GWIPDUM* is 0.467, again significant at the 1 % level, indicating that the existence of at least one goodwill impairment recognition in the previous two years is associated with a greater probability of forced CEO replacement, on average. The untabulated marginal effect of *GWIPDUM* is 0.9 percent, meaning that if *GWIPDUM* changes from zero to one, the unconditional probability of forced CEO

turnover increases by 3 percent. Given the unconditional probability of CEO turnover in our sample of 7.9 percent, these marginal effects are economically significant.

The associations between control variables and the dependent variable are mostly consistent with expectations and prior literature (e.g., Parrino, 1997; Lehn and Zhao, 2006; Fee et al., 2013). The likelihood of CEO turnover is higher for firms with larger assets and goodwill, for those with poor performance (both stock- and accounting-based), and for those with fewer analyst followings. CEOs who are older, with fewer shares, and not chairing the board are likely to be fired.

Firms that experience voluntary CEO departures could potentially be different from those with no CEO turnover, with unknown effects on the above results. Therefore, Table 3, model (3) reports estimates of equation (1) after dropping 207 CEO replacements that we classify as non-forced (those that appear to be for reasons such as health, personal concerns, retirement, or M&A). The results are qualitatively similar to those of model (1), with the coefficient of *GWIP* being 2.77, significant at the 1% level.[6]

Hypothesis 1 predicts that the recognition of goodwill impairment informs the board's decision to replace the CEO. This argument gives no reason to expect an association between goodwill impairment and voluntary CEO changes. Finding such an association would suggest either that goodwill impairment is not a channel by which poor M&A performance causes CEO dismals or that our classification method does not cleanly separate forced from voluntary turnovers. To investigate this possibility, Table 3, model (4) presents a falsification test in which voluntary turnover replaces forced turnover in equation (1) and the 473 forced turnovers from the main sample are dropped. The resulting coefficient of *GWIP* is negative and statistically insignificant.

[6] An untabulated regression with *GWIPDUM* replacing *GWIP* in model (3) produces identical inferences to those from model (2).

Overall, results presented in Table 3 support Hypothesis 1: Goodwill impairment charges appear to provide useful information about the CEO's ability and performance in making merger and acquisition decisions and operationalizing the post-merger activities, which in turn serves as an input for CEO retention decisions.

Since Lehn and Zhao (2006) relate forced CEO turnover to the value creation implied by the stock-price effects of acquisition announcements, we test whether the association between goodwill impairment provides incremental effect on CEO turnover. To do this, we expand equation (1) by adding *CAR*, the cumulative abnormal (market-adjusted) return over the three-day window around the merger or acquisition announcement. If a CEO completed more than one M&A deal during the tenure, *CAR* is calculated as the average of *CAR*s for all M&A deals that the CEO completed before the current fiscal year. We also include the interaction of *CAR* and *GWIP*. *CAR* represents the present value of expected future incremental cash flows to the acquirer resulting from the business combination, net of the price paid. The interaction term allows us to test the prediction that the interplay between the deal announcement effect and subsequent goodwill impairment is associated with the probability of forced CEO turnover.

Table 4 reports the results. In model (1), the coefficient of *GWIP* continues to be positive and significant at the 1 % level. The coefficient of *CAR* is -0.035 but statistically insignificant, although the Chi-square value is 1.718. The interaction term is positive but is also insignificant. Model (2) of Table 4 replaces *GWIP* with *GWIPDUM*, which produces no change of sign or significance of the coefficients of *CAR* or the interaction term. While the sign of the *CAR* coefficient is similar to that found by Lehn and Zhao (2006), the lack of significance is not. [7] The

[7] There are several differences in research design, as well as sample period, between our paper and Lehn and Zhao (2006). For CEOs who make multiple acquisitions, Lehn and Zhao only include the first acquisition completed by the CEO. We do not assume that a CEO's first acquisition is the most important, and therefore we calculate the average CAR of announcements for all acquisitions under the CEO prior to the focal year. Lehn and Zhao report a mean 3-

results imply that taking into account recent goodwill impairment charges, the past stock-price reaction to the deal announcement does not influence the board's decision to replace the CEO directly or through goodwill impairment.

To test Hypothesis 2, we calculated unexpected goodwill impairment based on the stock-market valuation of the firm, assuming that the market efficiently impounds information available to the board into stock prices. The unexpected goodwill impairment represents the surprise or information content of the goodwill impairment recognition. Evidence that forced turnover is associated only with the unexpected impairment would be consistent with reported goodwill impairment being an informational channel between the CEO's M&A performance and the board's decision to fire or retain the CEO.

Accounting standards require a goodwill impairment when the book value of a unit's assets exceeds the present value of its expected future net cash flows. We cannot observe these quantities at the unit level, so following prior literature we use their firm-level values as proxies (Li et al., 2011; Ramanda and Watts, 2012; Ayers et al., 2019a). To estimate expected goodwill impairment, we first subtract the firm's market value of equity from book value of equity. We measure market value of equity as stock price times common shares outstanding at the end of fiscal year. We measure book value of equity as the pre-impairment book value of equity at the end of the fiscal year[8]. We calculate this estimate as of the end of the two years of *GWIP* calculation period, and

day CARs of -1.27% around the announcement date. Our mean of averaged three-day CARs is 1.37%, which is consistent with Alexandridis, Antypas and Travlos (2017), who find short-run stock returns of 1.05% around the merger announcement in 2009-2015, which is closer to our period than Lehn and Zhao's 1990-1998 sample. In addition, we try separating negative and positive announcement reactions, given suggestions in the literature that only negative returns at the announcement date have predictive power for future performance. Regardless of return specification, we find no significant associations between any return specifications and CEO turnover and our test variable remain significance at 0.01 level.

[8] We use two alternative measures of book value of equity: 1) the book value of equity as the beginning period book-value of equity following Li and Sloan (2017); and 2) pre-impairment book value equity less the ending goodwill balance, which focus on tangible net assets following Li et al. (2011). Results are qualitatively the same.

sum the two values to produce *EXPGWIP*. For easy interpretation, we measure unexpected goodwill indicator variable, *UNEXPDUM*, as 1 if *EXPGWIP* is less than or equal to zero, 0 if *EXPGWIP* is larger than zero.

We test Hypothesis 2 in Table 5.[9] The column (1) results show that the association between *GWIP* and forced CEO turnover for a subsample of firms with unexpected goodwill impairment (*UNEXPDUM* =1). The coefficient of *GWIP* is positive and significant at the 1% level. Column (2) reports results for the subsample of firms with expected goodwill impairment. The coefficient of *GWIP* is positive but not significant. Column (3) repeats the tests in columns (1) and (2) and replaces *GWIP* with *GWIPDUM*. The results in Table 5 indicate that only the unexpected goodwill impairment is associated with subsequent forced turnover. This is consistent with the board's learning about CEO performance from reported goodwill impairment. Further, boards appear to recognize and hold CEOs accountable for new information provided by the reported impairment, rather than merely reacting to "old news." Therefore, our results show support to Hypothesis 2.

Panel A of Table 6 tests Hypothesis 3a which posits that goodwill impairment following M&A deals selected and managed by a CEO is more positively associated with the probability of a forced replacement of the CEO for companies audited by Big 4(5) auditors than for companies audited by non-Big 4(5) auditors. We split the full sample into two subsamples: firms audited by Big 4 or 5 auditors (*BIGAUD* = 1) and firms audited by others (*BIGAUD* = 0), and estimate model (1) separately. For brevity, we report the suppressed results. The left-side column shows results for the subsample of 4,123 companies audited by Big 4(5) auditors. The coefficient of *GWIP* is positive and significant. The right-side column reports, for the subsample of 1,867 companies audited by non-Big 4(5) auditors, that the coefficient of *GWIP* is not significant. As such, results

[9] We exclude *BTM* from the Table 5 regressions, as the correlation between *BTM* and *EXPGWIP* exceeds 0.5. However, including *BTM* in the model does not change the conclusions.

in Panel A of Table 6 support Hypothesis 3a that assurance reports provided by Big 4(5) auditors are perceived to be higher quality and that the goodwill impairment charge is more likely to be relied on by the board.

We examine Hypothesis 3b in Panel B of Table 7, where we split the sample into firms with analyst following above the sample median and firms with analyst following below the sample median. We estimate model (2) for two subsamples separately. The left-side column reports results for the subsample of 2,874 companies with more analysts, and the right-side represents results for the subsample of 3,116 companies with fewer analysts followed. The coefficients of *GWIP* are positive and significant in both subsamples. Untabulated tests show that the coefficients are not significantly different. Therefore, we do not find support for Hypothesis 3b; that is, boards' decisions based on reported goodwill impairment charges are not affected by the number of analyst followings.

Post-turnover Goodwill Impairment

One challenge to interpreting the main results as supporting Hypothesis 1 is that we are unable to be certain that goodwill impairment charges are related to the acquisitions upon which we build our sample versus acquisitions completed by a prior CEO. Other authors report that new CEOs tend to take abnormally large asset impairment charges (Francis et al., 1996; Riedl, 2004). New CEOs are not responsible for the outcomes of decisions made by their predecessors, and therefore impairments reported in their first year are unlikely to affect their reputation with the board. Also, recognizing more impairment in the first year reduces the likelihood of needing to report impairment charges in subsequent years. To gain further insight into the possibility that the goodwill impairment charges primarily follow CEO changes, rather than contribute to forced CEOs changes, we focus on CEO turnover subsamples and examine goodwill impairment charges around the CEO turnover events in our sample.

Specifically, we compare the goodwill impairment charges recognized two years before CEO turnovers and two years after CEO turnovers (including the year when the CEO turnover occurs and one year after the CEO turnover) for the forced turnover group and the voluntary turnover group. The pre-CEO turnover impairment is recorded prior to the departure of the CEO, and post-CEO turnover impairment is charged after the incoming CEO has been hired. Panel A of Table 7 presents the mean goodwill impairment separately for forced and voluntary turnovers. For the pre-turnover period, the mean *GWIP* for firms with forced turnover (0.023) is significantly higher (at the 5% level) than that for firms experiencing voluntary turnover (0.013). The mean *GWIPDUM* is also higher for firms with forced turnover (0.273) than that for firms with voluntary turnover (0.207). For the post-turnover period, the mean *GWIP* of the forced turnover sample is 0.028, which is not significant for that of the voluntary sample (0.021). The mean *GWIPDUM* for the forced turnover sample is also not significantly different from that of the voluntary turnover sample.

Panel B of Table 7 reports logistic regressions comparing pre- and post-turnover goodwill impairment for firms with forced and voluntary CEO turnovers. The results are consistent with those in Panel A. Specially, Model (1) of Panel B reports that *GWIP* prior to the CEO turnover is significantly positively associated with the probability of forced (as opposed to voluntary) CEO change. Model (2) shows that *GWIPDUM* prior to the CEO turnover is marginally significant ($p = 0.0629$) for the two turnover groups. In models (3) and (4), post-turnover *GWIP* and *GWIPDUM*, respectively, are not significantly associated with the probability of forced turnover. Overall, the results in Table 7 show that pre-turnover goodwill impairment is associated with the subsequent turnover being forced rather than voluntary, whereas post-turnover impairment has no significant

association with the CEO change being forced or voluntary.[10] The evidence helps alleviate the concern that goodwill impairments in our main tests could be driven by acquisitions for which the CEOs subsequently removed were not responsible.

We conduct further robustness checks to ensure our results are not driven by measurement, sample selection, or other statistical issues.

Omitting Firm Fixed Effects

We include firm fixed effect in the main models to control for unobservable and time-invariant firm characteristics. Greene (2004) suggests that the estimators of nonlinear fixed-effects model can be biased. Therefore, as a robustness check, we re-run the Table 4 regressions without firm fixed effects. The results (not tabulated) include a coefficient of *GWIP* in model (1) of 2.786 and a coefficient of *GWIPDUM* in model (2) of 0.448, both significant at the 1% level, qualitatively similar to results presented in Table 4. As another way of addressing possible biases in nonlinear fixed-effects models, we also estimate the fixed-effect linear probability models. The results again remain qualitatively unchanged, with the coefficient of *GWIP* equal to 0.247 and that of *GWIPDUM* equal to 0.044, both significant at 1%.

Sample with Doubled Goodwill

Although we are able to track the acquisitions made by the current CEO, the goodwill on the books might have been generated by the previous CEO, which reduces the responsibility of the current CEO for M&A performance. We restrict our sample to firms that have doubled their goodwill after the acquisitions made by the current CEOs. Our sample size is reduced by half to 2,623. Table 8 (model 1) presents the results. The coefficient of *GWIP* is still positive and significant at the 1% level.

[10] Untabulated results show that relative to the non-turnover sample, the voluntary turnover sample recognizes more goodwill impairment only in the post-turnover period, and there is no difference in pre-turnover impairment between the two groups.

Sample with Nonzero Goodwill Impairment

As an additional test of whether the magnitude of goodwill impairment is associated with forced CEO turnover, we exclude the observations with zero goodwill impairment. In model (2) of Table 8, the coefficient of *GWIP* is still positive and significant, albeit at the 10% level after losing 80 percent of the sample. The result supports the inference from Table 4 that the probability of forced turnover is increasing in the magnitude of goodwill impairment.

Management Incentives

As previously discussed, management may have incentives to avoid or delay the disclosure of goodwill impairment. We test whether performance-related incentives affect the association between disclosed goodwill impairment and the CEO retention decision. Following Riedl (2004) and Glaum, Landsman and Wyrwa(2018), we use two proxies to capture the incentives of managers to conceal impairment losses in periods with unusually high or low income before recognition of goodwill impairment. We classify a firm as having an unusually high income if its income is positive and the change in its income in the current year is above the median among those firms with a positive change in income. We classify a firm-year as a big-bath year if its income is negative and if it experiences a negative change in income in the current year, which is below the median among those firms with a negative change in income. We interact these two variables with goodwill impairment, respectively. We find no significant association between the goodwill impairment and the forced CEO turnover varies based on these two incentive variables. Therefore, we find no evidence that observable management incentives affect the informativeness of the goodwill impairment charge to boards' decisions on the CEO retention.

Deal Characteristics

Prior literature has identified a number of deal characteristics, such as overpayment, the target's public or private status and means of payment, that are associated with post-merger

performance and likelihood of future goodwill impairment (e.g. Bradley and Sundaram, 2004; Mitchell and Stafford, 2000; Loughran and Vijh, 1997; Gu and Lev, 2011). We test whether these factors drive the association between the CEO turnover and goodwill impairment. In our model (1), we control for a) overpayment, measured as ratio of offering price to target book value; b) whether the deal is paid all in cash; c) whether the target is a public company. Our results show that none of the above factors are either associated with CEO turnover or mitigate the association between goodwill impairment and CEO turnover[11]. The coefficients of impairment remain significant at 0.01 level in all models. Above results confirm our assertion that deal characteristics cannot explain a deal's value creation effect due to the fact that information about synergies and the success of the integration process only gradually becomes available and realized through goodwill impairment.

7. Conclusion

We investigate the role of accounting charges for goodwill impairment in informing the board's evaluation of CEO performance in selecting and integrating mergers and acquisitions, culminating in the potential dismissal of a poorly performing CEO. We start with merger and acquisition deals in years 1997 through 2016 and examine a sample of companies reporting goodwill impairment in years 2002 through 2016. We find that the probability of forced CEO turnover is increasing in goodwill impairment charges. We also find that when we include both goodwill impairment and the stock-price reaction to the announcement of the M&A deal as explanatory variables, only goodwill impairment predicts forced CEO turnover. While higher goodwill impairment charges appear around all CEO turnovers, the pre-turnover impairment charge is significantly higher for forced versus voluntary CEO changes, and the post-turnover

[11] Interactions of goodwill impairment and proxies for deal characteristics are insignificant.

impairment is similar or even higher for firms experiencing voluntary CEO changes. The results support the hypothesized informational role of goodwill impairment for boards' evaluation of CEO M&A performance.

We also find that the association between goodwill impairment and the forced CEO turnover is significant only for its unexpected component, suggesting the impairment surprise provides the board with new information about CEO performance. We find the impact of goodwill impairment and the forced CEO turnover to be significant for firms audited by Big 4 (5) auditors (roughly two thirds of the sample). The result is consistent with high-reputation auditors providing better quality assurance on the timing and amount of goodwill impairment, with commensurately greater board usage of the impairment information.

We find the main results to be robust to various measurement, specification and statistical issues. Our paper contributes to the literature on the internal governance of corporate merger and acquisition decisions as well as the literature on accounting for impaired goodwill. The results indicate that impairment charges convey incremental information to the board concerning the quality of the CEO's selection and execution of the business combination and that this information affects CEO retention decisions. Further, our paper presents results that should be of interest to regulators given that the FASB is currently revisiting accounting for goodwill impairments with the goal of improving decision usefulness of the information and rebalancing the cost benefit factors associated with recognizing goodwill impairments (FASB, 2019a). We find that accounting charges for goodwill impairment, which imply a deterioration in the capabilities of acquired assets to generate expected cash flows, provide meaningful signals to corporate boards concerning CEO under-performance in selecting and conducting acquisitions.

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Appendix: Variable definitions

Dependent variable		
FORCED	=	1 if the CEO is forced to step down in year t, 0 if the CEO retains or departs voluntarily. .
Explanatory and control variables		
BHAR	=	The market-adjusted buy-and-hold abnormal return (firm buy-and-hold return minus CRSP value-weighted index buy-and-hold return) in year t-1.
BIGAUD	=	1 if the company's auditor in year t-1 is one of the Big 4 (or 5) auditors.
BTM	=	Book value of equity divided by market value of equity at the end of year t-1.
CAR	=	The average of three-day cumulative abnormal return centered on acquisition announcement days when the CEO is in the current position. The abnormal return on a given day is the difference between the return of the firm's stock and the return of the CRSP value-weighted market index.
CHAIR	=	1 if the CEO chairs the board of directors, 0 otherwise.
EXPGWIP	=	Expected goodwill impairment, measured as the sum of (1) book value of equity plus the goodwill impairment less market value of equity at the end of year t-1, divided by total pre-impairment assets at the end of year t-1 and (2) book value of equity plus the goodwill impairment less market value of equity at the end of year t-2, divided by total pre-impairment assets at the end of year t-2.
FOUNDER	=	1 if the CEO is the founder or co-founder of the company, 0 otherwise.
GW	=	Goodwill divided by total assets at the end of year t-1.
GWIP		The sum of (1) the absolute value of goodwill impairment in year t-1 divided by total assets at the end of year t-2 and (2) the absolute value of goodwill impairment in year t-2 divided by total assets at the end of year t-3.
GWIP_post	=	The sum of (1) the absolute value of goodwill impairment in year t+1 divided by total assets at the end of year t and (2) the absolute value of goodwill impairment in year t+2 divided by total assets at the end of year t+1.
GWIPDUM	=	1 if *GWIP* is positive, 0 if *GWIP* is zero.
LEV	=	Total liabilities divided by total assets at the end of year t-1.
LNAGE	=	The natural logarithm of the CEO's age at the end of year t-1.
LNANALYST	=	The natural logarithm of the number of analysts following the company in year t-1.
LNAT	=	The natural logarithm of total assets at the end of year t-1.
LNTENURE	=	The natural logarithm of the number of years that the CEO has held the position through year t-1.
ROA	=	Income before goodwill impairment and extraordinary items in year t-1 divided by total assets at the end of year t-2.
SHROWN	=	The percentage of outstanding common shares held by the CEO at the end of year t-1.
UNEXPDUM	=	1 if *EXPGWIP* is less or equal to 0; 0 otherwise.

TABLE 1 Sample Selection

Thomson One Banker	Unique firms	Total firm-years
U.S. acquirers with at least $100 million market value from 1997 to 2016		14,159
Deals with value at least 10% of acquirers' market value		4,973
Execucomp and Compustat		
CEO sample from 2002 to 2016	2,867	29,134
Less: Firm-years with no prior M&A under the current CEO	(1,768)	(22,709)
Firm-years with zero goodwill at the beginning of the prior year	(25)	(75)
Firm-years with missing variables	(22)	(360)
Final sample	1,052	5,990

TABLE 2 Descriptive statistics and univariate tests

Panel A: Descriptive Statistics

Variable	Mean	Median	Min	Max	Std Dev
FORCED	0.079	0.000	0.000	1.000	0.270
GWIP	0.015	0.000	0.000	0.357	0.053
GWIPDUM	0.204	0.000	0.000	1.000	0.403
LNAT	7.705	7.567	4.822	11.538	1.454
GW	0.200	0.177	0.000	0.615	0.163
BHAR	0.063	0.010	-1.039	8.715	0.483
ROA	0.045	0.049	-0.280	0.255	0.075
LEV	0.537	0.541	0.099	1.123	0.200
BTM	0.543	0.468	-0.461	2.059	0.377
LNAGE	4.029	4.043	3.714	4.317	0.123
LNTENURE	1.998	2.079	0.000	3.497	0.770
CHAIR	0.560	1.000	0.000	1.000	0.496
FOUNDER	0.051	0.000	0.000	1.000	0.221
SHROWN	2.004	0.496	0.001	28.128	4.435
BIGAUD	0.688	1.000	0.000	1.000	0.463
LNANALYST	1.943	2.197	0.000	3.932	1.082
N = 5,990					

TABLE 2 (continued)

Panel B: Two-sample difference tests

	FORCED = 1		*FORCED* = 0		Difference test			
	(N = 473)		(N = 5,517)		t-test		Wilcoxon	
	Mean	Median	Mean	Median	p-value		Z-score	
GWIP	0.023	0.000	0.014	0.000	0.000	***	0.000	***
GWIPDUM	0.279	0.000	0.197	0.000	0.000	***	0.000	***
LNAT	7.903	7.807	7.688	7.552	0.002	***	0.001	***
GW	0.236	0.224	0.197	0.173	0.000	***	0.000	***
BHAR	-0.048	-0.059	0.072	0.018	0.000	***	0.000	***
ROA	0.035	0.043	0.046	0.050	0.003	***	0.001	***
LEV	0.545	0.553	0.536	0.540	0.358		0.317	
BTM	0.549	0.483	0.542	0.467	0.687		0.601	
LNAGE	4.069	4.094	4.026	4.025	0.000	***	0.000	***
LNTENURE	2.066	2.079	1.992	2.079	0.044	**	0.074	*
CHAIR	0.539	1.000	0.562	1.000	0.338		0.378	
FOUNDER	0.049	0.000	0.052	0.000	0.775		0.741	
SHROWN	1.224	0.387	2.070	0.508	0.000	***	0.000	***
BIGAUD	0.683	1.000	0.689	1.000	0.790		0.891	
LNANALYST	1.946	2.303	1.943	2.197	0.954		0.412	

This table reports the descriptive statistics and univariate analysis of variables used in model (1). Panel A reports mean, median, minimum, maximum and standard deviations of variables. Panel B compares firms experiencing forced CEO turnover and firms with no forced CEO turnover. *FORCED* equals to one when the CEO is forced to step down, and zero if the CEO is retained or departs voluntarily. T-test p-values of the mean difference and Wilcoxon nonparametric Z-scores are reported. *, **, and *** represent statistical significance at the 0.1, 0.05, and 0.01 levels based on two-sided values, respectively. All continuous variables are winsorized at 1st and 99th percentiles of the sample. See Appendix for definitions of other variables.

TABLE 3 Correlations

	GWIP	*LNAT*	*GW*	*BHAR*	*ROA*	*LEV*	*BTM*	*LNAGE*	*LNTEN-URE*	*CHAIR*	*FOUN-DER*	*SHROWN*	*BIGAUD*	*LNAN-AYST*
FORCED	0.043 (0.001)	0.040 (0.002)	0.063 (<0.001)	-0.067 (<0.001)	-0.038 (0.003)	0.012 (0.358)	0.005 (0.688)	0.096 (<0.001)	0.026 (0.045)	-0.012 (0.338)	-0.004 (0.775)	-0.051 (<0.001)	-0.003 (0.790)	0.001 (0.954)
GWIP		-0.137 (<0.001)	0.022 (0.084)	-0.013 (0.306)	-0.213 (<0.001)	0.063 (<0.001)	0.134 (<0.001)	-0.034 (0.008)	-0.003 (0.834)	-0.033 (0.011)	0.033 (0.010)	0.023 (0.077)	0.021 (0.104)	-0.098 (<0.001)
LNAT			0.042 (0.001)	-0.050 (0.000)	0.099 (<0.001)	0.345 (<0.001)	-0.055 (<0.001)	0.133 (<0.001)	-0.066 (<0.001)	0.135 (<0.001)	-0.094 (<0.001)	-0.138 (<0.001)	0.042 (0.001)	0.295 (<0.001)
GW				-0.034 (0.009)	0.124 (<0.001)	-0.075 (<0.001)	-0.096 (<0.001)	-0.036 (0.006)	-0.028 (0.031)	0.003 (0.843)	-0.031 (0.017)	-0.038 (0.003)	0.040 (0.002)	0.068 (<0.001)
BHAR					0.190 (<0.0001)	-0.001 (0.964	-0.261 (<0.001)	0.003 (0.802)	-0.006 (0.616)	0.004 (0.737)	-0.002 (0.867)	0.022 (0.086)	-0.016 (0.205)	-0.008 (0.520)
ROA						-0.175 (<0.001)	-0.217 (<0.001)	0.078 (<0.001)	0.033 (0.012)	0.042 (0.001)	-0.019 (0.137)	0.027 (0.040)	0.005 (0.706)	0.123 (<0.001)
LEV							-0.235 (<0.001)	0.077 (<0.001)	-0.048 0.000)	0.039 0.003)	-0.074 (<0.001)	-0.059 (<0.001)	0.093 (<0.001)	-0.073 (<0.001)
BTM								-0.001 (0.927)	0.005 (0.701)	0.004 (0.753)	0.002 (0.874)	0.033 (0.010)	-0.014 (0.292)	-0.116 (<0.001)
LNAGE									0.372 (<0.001)	0.209 (<0.001)	0.068 (<0.001)	0.126 (<0.001)	0.049 (0.000)	0.038 (0.004)
LNTENURE										0.266 (<0.001)	0.255 (<0.001)	0.329 (<0.001)	0.003 (0.787)	0.059 (<0.001)
CHAIR											0.078 (<0.001)	0.107 (<0.001)	0.027 (0.034)	0.027 (0.034)
FOUNDER												0.261 (<0.001)	-0.042 (0.001)	0.029 (0.025)
SHROWN													-0.018 (0.155)	-0.064 (<0.001)
BIGAUD														-0.005 (0.693)

This table reports Pearson correlations among variables used in model (1). p-values are presented in parentheses.
All continuous variables are winsorized at 1st and 99th percentiles of the sample.

TABLE 4 Logistic regressions: The effect of goodwill impairment

	Forced vs. All Other (1)		Forced vs. All Other (2)		Forced vs. Non-turnover (3)		Voluntary vs. Non-turnover (4)	
Intercept	-19.280	***	-19.121	***	-20.655	***	-40.935	
	[84.14]		[82.66]		[93.299]		[0.047]	
GWIP	2.825	***			2.766	***	-1.227	
	[11.575]				[10.952]		[0.569]	
GWIPDUM			0.467	***				
			[15.744]					
LNAT	0.141	***	0.126	***	0.143	***	0.073	
	[11.971]		[9.729]		[12.176]		[1.519]	
GW	1.228	***	1.276	***	1.181	***	-2.004	***
	[13.37]		[14.393]		[12.096]		[11.982]	
BHAR	-0.774	***	-0.801	***	-0.795	***	-0.009	
	[21.703]		[23.027]		[22.29]		[0.003]	
ROA	-2.323	***	-2.364	***	-2.607	***	-3.518	***
	[10.151]		[10.454]		[12.643]		[13.206]	
LEV	-0.454		-0.502		-0.481		-0.635	
	[2.157]		[2.618]		[2.379]		[2.098]	
BTM	-0.182		-0.248		-0.188		-0.019	
	[1.343]		[2.429]		[1.422]		[0.008]	
LNAGE	3.756	***	3.784	***	4.117	***	7.228	***
	[58.513]		[59.018]		[67.445]		[85.615]	
LNTENURE	0.121		0.118		0.112		-0.07	
	[2.304]		[2.189]		[1.963]		[0.385]	
CHAIR	-0.266	**	-0.252	**	-0.266	**	0.04	
	[6.151]		[5.517]		[6.08]		[0.062]	
FOUNDER	0.069		0.089		0.057		-0.077	
	[0.076]		[0.127]		[0.051]		[0.054]	
SHROWN	-0.093	***	-0.095	***	-0.097	***	-0.072	***
	[19.656]		[20.36]		[20.82]		[7.124]	
BIGAUD	-0.035		-0.035		-0.039		-0.124	
	[0.104]		[0.108]		[0.128]		[0.615]	
LNANALYST	-0.095	*	-0.096	**	-0.102	**	-0.174	**
	[3.756]		[3.74]		[4.27]		[5.959]	
Year, Industry FE	Yes, Yes		Yes, Yes		Yes, Yes		Yes, Yes	
R^2	0.039		0.040		0.043		0.037	
N	5,990		5,990		5,783		5,517	

This table reports logistic regression results for the effect of goodwill impairment on CEO turnover. The dependent variable in the first two models is one for forced CEO turnovers, zero for voluntary or non-turnovers. The test variable in the first and third models is *GWIP*, a continuous measure of goodwill impairment in the last two years, and in the other models is *GWIPDUM*, a dummy variable equal to one if goodwill impairment is recognized in the last two years, and zero otherwise. The dependent variable in the third model is one for forced CEO turnovers and zero for non-turnovers, and is one for voluntary CEO turnovers and zero for non-turnovers in the final model. Chi-square statistics are in brackets. *, **, and *** represent statistical significance at the 0.1, 0.05, and 0.01 levels based on two-sided values, respectively. All continuous variables are winsorized at 1st and 99th percentiles. See Appendix for variable definitions.

TABLE 5 Logistic regressions: adding M&A overpayment

	Forced vs. All Other (1)		Forced vs. All Other (2)	
Intercept	-18.870	***	-18.742	***
	[73.0174]		[71.938]	
GWIP	2.942	***		
	[10.362]			
GWIPDUM			0.505	***
			[16.198]	
CAR	-0.469		-0.506	
	[0.406]		[0.472]	
*GWIP*CAR*	5.260			
	[0.346]			
*GWIPDUM*CAR*			8.776	
			[0.827]	
LNAT	0.133	***	0.122	***
	[8.618]		[7.280]	
GW	1.153	***	1.176	***
	[10.321]		[10.662]	
BHAR	-2.407	***	-0.696	***
	[15.140]		[15.919]	
ROA	-2.407	***	-2.454	***
	[9.716]		[10.024]	
LEV	-0.518	*	-0.590	*
	[2.516]		[3.236]	
BTM	-0.279	*	-0.363	**
	[2.450]		[4.028]	
LNAGE	3.683	***	3.713	***
	[49.884]		[50.376]	
LNTENURE	0.157	*	0.155	*
	[3.321]		[3.256]	
CHAIR	-0.211	*	-0.197	*
	[3.422]		[2.979]	
FOUNDER	0.087		0.104	
	[0.115]		[0.165]	
SHROWN	-0.101	***	-0.104	***
	[19.003]		[19.793]	
BIGAUD	-0.005		-0.001	
	[0.002]		[0.001]	
LNANALYST	-0.032		-0.033	
	[0.278]		[0.295]	
Year, Industry FE	Yes, Yes		Yes, Yes	
R^2,*N*	0.037, 5,475		0.038, 5,475	

This table reports logistic regressions for the effect of goodwill impairment on CEO turnover, conditioning on overpayment proxied by announcement CAR. The dependent variable is one for forced CEO turnovers, zero for voluntary or non-turnovers. *CAR* is the average of three-day cumulative abnormal return centered on acquisition announcement days when the CEO is in the current position. Chi-square statistics are in brackets. *, **, and *** denote two-tail significance at the 0.1, 0.05, and 0.01 levels, respectively. All continuous variables are winsorized at 1st and 99th percentiles of the sample. See Appendix for variable definitions.

TABLE 6 Logistic regressions: Expected and unexpected goodwill impairment

	Unexpected		Expected		Unexpected		Expected	
	(1)		(2)		(3)		(4)	
Intercept	-20.343	***	-10.037		-20.327	***	-10.227	
	[85.045]		[2.545]		[84.719]		[2.658]	
GWIP	2.899	***	0.921					
	[7.031]		[0.339]					
GWIPDUM					0.465	***	0.613	
					[13.641]		[2.08]	
LNAT	0.146	***	-0.175		0.133	***	-0.172	
	[12.266]		[0.966]		[10.256]		[1.012]	
GW	1.088	***	3.683	***	1.101	***	3.731	***
	[9.473]		[12.582]		[9.651]		[13.596]	
BHAR	-0.71	***	-0.786		-0.711	***	-0.749	
	[17.89]		[2.414]		[17.886]		[2.196]	
ROA	-2.639	***	-0.656		-2.643	***	-0.506	
	[11.929]		[0.075]		[11.883]		[0.044]	
LEV	-0.401		0.303		-0.41		0.209	
	[1.762]		[0.097]		[1.849]		[0.048]	
LNAGE	4.009	***	2.078		4.041	***	2.068	
	[59.608]		[1.734]		[60.151]		[1.717]	
LNTENURE	0.172	**	-0.426	*	0.175	**	-0.444	*
	[4.069]		[2.975]		[4.227]		[3.203]	
CHAIR	-0.242	**	-0.648		-0.237	**	-0.649	
	[4.639]		[2.436]		[4.452]		[2.467]	
FOUNDER	-0.072		1.328	*	-0.061		1.28	*
	[0.07]		[3.564]		[0.051]		[3.3]	
SHROWN	-0.091	***	-0.096		-0.094	***	-0.098	
	[16.772]		[2.7]		[17.429]		[2.673]	
BIGAUD	-0.111		0.642		-0.117		0.645	
	[1.001]		[2.293]		[1.102]		[2.289]	
LNANALYST	-0.097	*	-0.018		-0.094	*	-0.036	
	[3.68]		[0.01]		[3.481]		[0.037]	
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
R-square	0.04		0.074		0.041		0.077	
N	5468		522		5468		522	

This table reports the logistic regression results on the effect of goodwill impairment on force CEO turnover for the subsample firms with unexpected and expected goodwill impairment. Dependent variable in columns (1) - (4) is one for forced CEO turnovers, zero for voluntary or non-turnovers. Column (1) and (3) show the results for a subsample of firms with expected goodwill impairment less than zero (or unexpected impairment). Column (2) and (4) show results for a subsample of firms with expected goodwill impairment larger than zero. Expected goodwill impairment, measured as the sum of book value of equity plus the goodwill impairment less market value of equity, divided by total pre-impairment assets. Chi-square statistics are in brackets. *, **, and *** represent statistical significance at the 0.1, 0.05, and 0.01 levels based on two-sided values, respectively. All continuous variables are winsorized at 1st and 99th percentiles of the sample. See Appendix for variable definitions.

TABLE 7
Logistic regressions: The effects of auditor and analyst coverage

Panel A: Subsamples with and without a Big 4 Auditor

	BIGAUD = 1		*BIGAUD* = 0	
	(1)		(2)	
GWIP	3.619		0.612	
	[14.553]	***	[0.112]	
Controls	Yes		Yes	
Year, Industry FE	Yes, Yes		Yes, Yes	
R^2	0.041		0.057	
N	4,123		1,867	

Panel B: Subsamples with high and low analyst coverage

	LNANALYST = high		*LNANALYST* = low	
	(1)		(2)	
GWIP	2.523		2.758	
	[3.025]	*	[7.046]	***
Controls	Yes		Yes	
Year, Industry FE	Yes, Yes		Yes, Yes	
R^2	0.054		0.048	
N	2,874		3,116	

This table reports the logistic regression results on the effect of goodwill impairment on force CEO turnover for subsamples based on auditors and analysts. Dependent variable in all models is one for forced CEO turnovers, zero for voluntary or non-turnovers. Panel A of this table presents results for subsample firms audited by Big 4 (5) (*BIGAUD*=1) versus non-Big4(5) (*BIGAUD* = 0) auditors in columns (1) and (2), respectively. Panel B of this table reports the logistic regression results for subsample firms with high versus low analyst coverage in columns (1) and (2), respectively. *LNANALYST* is high if the number of analyst followings is larger than the sample median, and is low otherwise. Coefficients of control variables are not tabulated in tables for brevity. Chi-square statistics are in brackets. *, **, and *** represent statistical significance at the 0.1, 0.05, and 0.01 levels based on two-sided values, respectively. All continuous variables are winsorized at 1st and 99th percentiles of the sample. See Appendix for variable definitions.

TABLE 8
Goodwill impairment pre− and post−CEO turnover

Panel A: Means and difference of mean tests

	Forced	Voluntary	Difference	t for difference
Pre-turnover *GWIP*	0.023	0.013	0.010	2.29 **
Post-turnover *GWIP*	0.028	0.021	0.001	1.30
Pre-turnover *GWIPDUM*	0.273	0.207	0.066	1.75 *
Post-turnover *GWIPDUM*	0.336	0.296	0.040	0.95

Panel B: Logistic regressions to explain forced CEO turnover

	Forced vs. Voluntary Pre-turnover	Forced vs. Voluntary Pre-turnover	Forced vs. Voluntary Post-turnover	Forced vs. Voluntary Post-turnover
	(1)	(2)	(3)	(4)
GWIP	4.187 **			
	[4.28]			
GWIPDUM		0.362		
		[2.343]		
GWIP_post			1.950	
			[0.962]	
GWIPDUM_post				0.168
				[0.494]
Controls	Yes	Yes	Yes	Yes
Year, Industry FE	Yes, Yes	Yes, Yes	Yes, Yes	Yes, Yes
R^2	0.175	0.140	0.172	0.173
N	665	665	616	616

This table compares goodwill impairment around CEO turnover for firms with forced turnovers versus voluntary turnovers. Panel A reports means of goodwill impairment in the pre- and post- turnover years and their differences separately for firms with forced versus voluntary CEO turnovers. Panel B presents logistic regression results comparing forced versus voluntary CEO turnovers. Dependent variable is one for forced CEO turnovers and zero for voluntary turnovers in columns (1)-(4). Test variable in columns (1) and (2) is goodwill impairment charged two years before the CEO turnover. Test variable in columns (3) and (4) is goodwill impairment charged two years after the CEO turnover. Coefficients of control variables are not tabulated in tables for brevity. Chi-square statistics are in brackets. *, **, and *** represent statistical significance at the 0.1, 0.05, and 0.01 levels based on two-sided values, respectively. All continuous variables are winsorized at 1st and 99th percentiles of the sample. See Appendix for variable definitions.

TABLE 9
Logistic regressions: Samples limited to firms with doubled goodwill or nonzero impairment

	Doubled Goodwill		Nonzero Impairment	
	(1)		(2)	
Intercept	-17.977	***	-25.301	
	[36.401]		[0.02]	
GWIP	3.251	***	1.963	*
	[7.2]		[3.12]	
LNAT	0.147	**	0.090	
	[6.149]		[1.19]	
GW	1.288	**	1.127	
	[5.68]		[2.477]	
BHAR	-0.981	***	-0.639	**
	[16.913]		[4.92]	
ROA	-1.773	*	-1.317	
	[3.131]		[0.906]	
LEV	-0.619		-0.622	
	[1.863]		[1.23]	
BTM	-0.281		-0.289	
	[1.322]		[1.347]	
LNAGE	3.334	***	2.962	***
	[21.22]		[9.321]	
LNTENURE	0.073		0.312	*
	[0.361]		[3.744]	
CHAIR	-0.388	**	-0.213	
	[6.087]		[1.035]	
FOUNDER	0.086		0.049	
	[0.061]		[0.012]	
SHROWN	-0.099	***	-0.094	***
	[10.218]		[7.092]	
BIGAUD	-0.143		0.399	*
	[0.814]		[3.025]	
LNANALYST	-0.094		0.021	
	[1.492]		[0.043]	
Year, Industry FE	Yes, Yes		Yes, Yes	
R^2	0.043		0.067	
N	2,623		1,222	

Dependent variable is one for forced CEO turnovers, zero for voluntary or non-turnovers. Column (1) of this table presents results for subsample firms that doubled their goodwill after the acquisition. Column (2) of this table presents results for subsample firms that recognized non-zero goodwill impairment. Chi-square statistics are in brackets. *, **, and *** represent statistical significance at the 0.1, 0.05, and 0.01 levels based on two-sided values, respectively. All continuous variables are winsorized at 1st and 99th percentiles of the sample. See Appendix for variable definitions.