Erasmus School of Economics[1]

Master Thesis Accounting and Auditing

CEO responsibility and auditor dismissal

An empirical study on the relation between CEO responsibility and auditor dismissal following an impairment of goodwill

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Abstract

SFAS 142 ended goodwill amortization and instead requires an impairment-only approach. As a result, goodwill accounting is subject to significant management discretion as the fair value is a function of management's future actions. This can lead to relational challenges because management has incentives to delay impairments, whereas auditors have incentives to minimize management's bias. As a result, management can dismiss the auditor as a punishment for recording an impairment. This paper examines if the relational challenges increase when the currently sitting CEO is responsible for the goodwill impairment. CEOs can be responsible for the impairment when they made the M&A decision and/or mismanaged the acquired assets. The results show that CEOs who are responsible for the goodwill impairment are significantly more likely to dismiss the auditor. Thus, relational challenges increase when the currently sitting CEO is responsible for the impairment. No evidence is found that there is a relation between CEO tenure and the likelihood that a responsible CEO dismisses the auditor.

Keywords: CEO responsibility, CEO tenure, auditor dismissal, goodwill impairment

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1. Introduction

The introduction of SFAS 142 dramatically changed accounting for goodwill. While previously goodwill was amortized, now annual impairment testing is required. Impairment testing increased the amount of management discretion as the fair value of goodwill is a function of management's future action (Ramanna and Watts, 2012). The increase in discretion presents technical challenges for auditors, as highlighted by Public Company Accounting Oversight Board (hereafter: PCAOB) inspection reports that reveal that testing for impairment of goodwill is a commonly cited audit deficiency (Hanson, 2012). Ayres, Neal, Reid and Shipman (2019) find that auditors are not only technically challenged by the new standard, but also face relational challenges. As documented by Beatty and Weber (2006), management has incentives to delay impairments because they want to avoid debt covenant violation or issues with exchange listing requirements. Auditors, on the other hand, want to minimize management's bias in the impairment testing process to reduce the likelihood of material misstatements. This clash in incentives can lead to relational challenges as auditors are punished for recording an impairment in the form of an auditor dismissal (Carcello and Neal, 2003; Ayres et al., 2019). As a result, auditors can fear dismissal which can lower auditor independence and therefore lead to a bias in the impairment testing. This paper investigates whether the relational challenges, and thus independence issues, increase when the currently sitting CEO can be held responsible for the goodwill impairment.

Beatty and Weber (2006) and Ramanna and Watts (2012) document that tenure affects management's incentives to delay impairments as it can be used as a proxy for responsibility. CEO tenure affects the decision to impair because a longer tenure increases the chance that the CEO made the M&A decision and can therefore be held accountable. Hypothesis 1 tests whether relational problems increase when the currently sitting CEO can be held responsible for the goodwill impairment. If responsible CEOs have more incentives to delay impairments, it is expected that they are also more likely to dismiss the auditor as a punishment for recording an impairment. However, if CEOs are punished regardless of whether they can be held accountable for the acquisition, there may not be a significant relation between being responsible and dismissing the auditor. By estimating a logistic regression, a significantly positive relation is documented. Thus, relational problems increase when the currently sitting CEO is responsible for the impairment.

Beatty and Weber (2006) use tenure as a proxy for CEO responsibility. However, there are reasons to believe that CEOs' incentives to delay impairments changes over their career. Darrough, Guler and Wang (2014) find that long-tenured CEOs' cash compensation is not affected by goodwill impairments. Short-tenured CEOs, however, do experience a significant reduction in their compensation. In addition, Ali and Zhang (2015) document that CEOs in their early years have incentives to delay write-offs because of career concerns. Because of these findings, Hypothesis 2 tests whether impairments recorded under responsible CEOs with short tenures lead to more relational problems. If short-tenured CEOs' incentives are influenced by compensation and career concerns, it is expected that they dismiss the auditor significantly more often. By estimating a logistic regression, I do not document evidence that tenure affects a responsible CEO's decision to dismiss the auditor.

Additional analyses are performed which show that CEOs are significantly more likely to get laid off after an impairment is recorded. This provides another incentive to not record impairments. In addition, research is conducted on the big bath accounting theory, which predicts that CEOs want to impair goodwill in their first year (Jordan and Clark, 2004; Masters-Stout, Costigan and Lovata, 2008). Using a logistic regression, no evidence is found that first-year CEOs impair goodwill more frequently or that they impair relatively more goodwill. Furthermore, if first-year CEOs want to impair goodwill, it is expected that they are significantly less likely to dismiss the auditor after goodwill is written off. For this, also no evidence is found.

Finally, robustness tests are conducted to show that the findings are consistent when using any change in auditor as the dependent variable. No evidence is found that the likelihood of an auditor being dismissed is affected by the interaction between CEO responsibility and the relative size of the impairment. Finally, models are estimated to show that the results are not affected by responsible CEOs having incentives to delay impairments in line with the horizon problem (Ali and Zhang, 2015). When excluding observations where CEOs are in their final year, the relation between CEOs being responsible and auditors getting dismissed remains positive and significant.

This paper provides valuable insights to regulators and academics. First, the results show that relational challenges increase when the audited firm has a CEO who is responsible for the impairment. Thus, finding additional evidence that auditors are not only technically challenged when auditing goodwill, but also face relational challenges. Second, these relational challenges

can lead to independence issues and therefore increase the risk that goodwill is manipulated by management. The findings in this paper can help stakeholders and regulators to identify cases in which auditor independence is more likely reduced. Third, while only studying goodwill impairments, the findings of this paper may be generalizable to other accounting items that use fair value. This is valuable because there has been an increasing trend in the use of fair value in accounting over the last few decades (Carcello, Neal, Reid and Shipman, 2020). Fourth, this paper documents that CEOs have incentives to prevent impairments because it increases the likelihood of getting laid off. Finally, some evidence is found that new CEOs no longer exhibit big bath behaviour.

The rest of this paper is organised as follows. Section 2 presents the literature review and develops the hypotheses. Sections 3 and 4 contain the research design and sample selection. Section 5 presents and discusses the findings. Section 6 contains the additional analyses and robustness tests. Finally, Section 7 contains the conclusions, limitations, and recommendations for future research.

2. Literature review

This section covers the different causes of goodwill impairment. Goodwill impairments represent significant events for firms. CEOs have various incentives to not record write-offs. These incentives conflict with those of the auditor which leads to relational challenges. Hypotheses are developed to test if these CEO incentives influence the decision to dismiss an auditor.

2.1. Accounting for goodwill

Goodwill is an intangible asset that is recognized after an acquisition as the difference between the acquisition price and the fair value of all acquired assets (Johnson and Petrone, 1998). For companies based in the US, goodwill accounts, on average, for more than half of the purchase price of an acquisition (Shalev, 2009). Prior to SFAS 142 (now ASC section 350-20), goodwill accounting was governed by APB 17 (AICPA, 1970) and SFAS 121 (FASB, 1995). Goodwill accounting was fairly straightforward and required little involvement of the auditor because it was subject to periodic amortization (Carcello et al., 2020). While goodwill was also subject to impairment, this was only done when associated long-lived assets were also impaired. The introduction of SFAS 142 ended goodwill amortization and required instead an impairment-only approach. Auditing goodwill is now significantly more complex and time-consuming (Carcello and Neal, 2003).

2.2. Impairment of goodwill

SFAS 142 mandates annual fair-value-based tests for goodwill impairments. All goodwill is allocated among the reporting units of the firm. A reporting unit is generally an operating segment or a component thereof (Ramanna and Watts, 2012). The reporting unit's fair value is estimated using future cash flows and is compared to the unit's book value. When the book value exceeds the fair value, an impairment loss is recognized in an amount equal to the excess.

Goodwill impairments represent significant corporate events for firms (Ayres et al., 2019). In 2018, $78.9 billion of goodwill got impaired in the US (Warner, Todorova, Roland and Nunes, 2019). Impairments are not only material events, but also affect annually, on average, 9.4 percent of the companies included in the sample of this paper (see Section 4.3.). 35.2 percent of the companies in the sample have experienced at least one impairment between 2002 and 2019. Existing literature shows the relevance of impairments by documenting that investors respond to goodwill impairments. Following a goodwill impairment, the stock price of the respective company decreases, and investors and financial analysts lower their expectations (Bens, Heltzer and Segal, 2011; Li, Shroff, Venkataraman and Zhang, 2011). Because goodwill impairment information is value-relevant, it is important that investors can rely on it. Timely recording of an impairment can alleviate the information asymmetry between management and outsiders. This is important because it allows investors to improve their capital allocation (Bens et al., 2011).

2.3. Causes of impairment

As mentioned in Section 2.2., goodwill is impaired when the fair value falls below the book value. Hayn and Hughes (2006) and Olante (2013) argue that this is caused by overpayment for the target, rather than from the occurrence of subsequent events that deteriorate the performance of the reporting unit to which the goodwill is allocated. Goodwill impairments can thus be retraced to the M&A decision. This means that the CEO at the time of the goodwill impairment, might not be the one who actually executed the acquisition.

On the other hand, Riedl (2004) and Beatty and Weber (2006) argue that a poor M&A decision *ex post*, could have been a good decision *ex ante*. Changing market conditions and other economic factors beyond the control of the CEO can cause a decreasing performance of the firm, leading to a goodwill write-off. This view contradicts that of Hayn and Hughes (2006) and Olante (2013). In addition, mismanagement of the acquired assets, which can be traced

back to the current CEO, can lead to impairments (Beatty and Weber, 2006; Darrough et al., 2014). This way, a new CEO that was not involved in the M&A decision can still be held accountable for the impairment. While a company's CEO is not solely responsible for the success or failure of an acquisition, most studies do hold the CEO accountable for the acquisition (Brown and Sarma, 2007; Yim, 2013; Darrough et al., 2014).

2.4. Technical challenges

The introduction of SFAS 142 increased the amount of discretion in accounting for goodwill (Beatty and Weber, 2006). The current fair value of goodwill is a function of management's future actions and depends on management's implementation of the firm strategy (Ramanna and Watts, 2012). Management's estimates of goodwill are unverifiable and are based on assumptions and cash flow predictions. As a result of the high amounts of discretion, auditors are technically challenged which is unwanted since monitoring provided by external auditors can reduce information asymmetry (Beatty and Weber, 2006; Schaub, 2006). Inspection reports of the PCAOB also document this challenge and commonly state that impairment testing of goodwill is an audit deficiency (PCAOB, 2017).

2.5. Management vs auditor incentives

CEOs can use the discretion mentioned in Section 2.4. to delay goodwill impairments. Managers have incentives to do so because they want to maximize investor's perceived value of the company (Penno and Watts, 1991). Beatty and Weber (2006) find that managers subjectively delay goodwill impairments when there are concerns about debt covenant violation or when there are issues with exchange listing requirements. Compensation, tenure and career concerns also affect the CEO's decision to not record goodwill impairments.[2] Excluding goodwill impairments from management's bonus plan increases the probability of recognizing a write-off by 22 percent. CEO tenure affects the decision to impair because a longer tenure increases the chance that the CEO made the M&A decision. Tenure can be seen as a proxy for responsibility of the acquired assets (Ramanna and Watts, 2012). Milbourn (2003) argues that tenure can be used as a proxy for CEO reputation because a longer serving CEO has survived more CEO dismissal decisions. CEOs want to shield their reputation from the implications of recording a goodwill write-off. Beatty and Weber (2006) argue that responsible CEOs therefore have more incentives to delay impairments than new CEOs. On

[2] Of the various incentives described theoretically in this section, I validate the CEO career concern incentive empirically in Section 6.1.

the contrary, Darrough et al. (2014) find that the compensation of long-tenured CEOs is not affected by goodwill impairments, while short-tenured CEOs do experience a significant decrease in compensation. The authors argue that this can be explained by the fact that long-tenured CEOs have better track records and/or are more entrenched and protected. In addition, new CEOs have to prove themselves, while CEOs with a long tenure have already established a reputation. As a result, new CEOs might have more incentives to delay impairment than long-tenured CEOs. The authors do not distinguish between CEOs that are responsible for the impairment and new CEOs. Therefore, it is unclear whether responsible CEOs also have compensational incentives to delay impairments.

Management's incentives clash with those of auditors (Ayres et al., 2019). Auditors want to minimize management's bias in goodwill impairment testing. This way they reduce the likelihood of material misstatements in financial statements which provides stakeholders with the most reliable information. Furthermore, auditors want to avoid reputation damage and sanctions from the PCAOB. Holtzman and Sinnett (2009) document the tension between management and auditors in their survey held among 2,500 senior financial executives. Numerous respondents cite "auditor issues" as the most significant problem they had to deal with during the impairment process.

2.6. Relational challenges

Auditors do not only have to deal with technical challenges resulting from the nature of goodwill accounting, but also with relational challenges as indicated by the survey of Holtzman and Sinnett (2009). Ayres et al. (2019) document that these relational challenges originate from the difference in incentives (see Section 2.5.). The decision to impair goodwill can irreparably damage the auditor-client relationship, resulting in an increase in the likelihood of auditors being dismissed by the client. CEOs can dismiss the auditor as a punishment for impairing the goodwill which could lead to independence issues because auditors want to avoid being dismissed (Williams, 1988; Ayres et al., 2019). This can be troublesome since lower levels of independence result in a lower quality of the auditor's judgement and increase the risk that goodwill is manipulated by management (Carcello et al., 2020). The findings of Ayres et al. (2019) are in line with those of DeFond and Jiambalvo (1993) who document that challenging management's opportunistic behaviour is the most reported reason for dismissing the auditor. When auditors impair goodwill, they indirectly argue that management cannot increase future cash flows enough to keep the fair value of the reporting unit above the book value (see Section 2.2.).

2.7. Hypotheses development

As mentioned in Section 2.3., CEOs can be responsible for the impairment by overpaying at the time of the M&A decision and/or by mismanaging the acquired assets. Responsible CEOs have, among others, reputational incentives and potentially compensational incentives to not impair goodwill (Beatty and Weber, 2006; Darrough et al., 2014). Because responsibility affects these two incentives, it is expected that responsibility also affects the CEO's incentives to delay impairments. Moreover, with an impairment comes the decision to dismiss the auditor. Therefore, responsibility is expected to influence auditor dismissal as well. New CEOs have not made the M&A decision and are less likely to have mismanaged the acquired assets. It is therefore expected that they also have fewer reputational incentives to not impair goodwill. If new CEOs have fewer incentives to not record impairments, it is expected that an impairment recorded under a CEO that is not responsible is followed less often by an auditor dismissal. It could be that CEOs are punished for a write-off regardless of whether they made the M&A decision or have mismanaged the assets. This would mean that responsible CEOs and new CEOs have the same incentives to delay impairments. If this is the case, it is expected that whether the CEO is responsible does not affect the likelihood that the auditor is dismissed.

Responsible CEOs want to shield their reputation from the implications of a goodwill impairment. In addition, they might have compensation motives (Beatty and Weber, 2006; Darrough et al., 2014). It is therefore expected that responsible CEOs have more incentives to delay goodwill impairments than new CEOs and are thus more likely to dismiss the auditor as a punishment for recording an impairment. Therefore, the following hypothesis is tested:

Hypothesis 1: The likelihood of an auditor being dismissed is higher when the currently sitting CEO is responsible for the impaired goodwill.

Support for this hypothesis will provide more insights into how CEO incentives affect accounting for goodwill. Also, additional evidence can be found that goodwill, under its current accounting rules, can lower auditor independence depending on whether the current CEO is responsible. Finally, it can help stakeholders and regulators identify cases in which goodwill is more likely misstated.

Beatty and Weber (2006) and Ramanna and Watts (2012) document that tenure affects management's incentives to not impair goodwill. CEOs with longer tenure are more likely to have made the M&A decision and therefore have more incentives to shield their reputation from the implications of recording a goodwill write-off. In their research, tenure is measured

as the total years that the CEO has held office. The authors document that a longer tenure leads to a lower likelihood of recording a goodwill impairment. However, this finding might be flawed as tenure also captures other incentives than responsibility. Darrough et al. (2014) document that long-tenured CEOs are shielded from negative consequences of an impairment on their cash compensation. On the contrary, short-tenured CEOs do experience a significant drop in their compensation following a goodwill write-off. This suggests that short-tenured CEOs have more incentives to delay impairments. Ali and Zhang (2015) document that there is a systematic pattern in the magnitude of write-offs over the career of a CEO. In the first year of service, CEOs record more write-offs which is in line with the "big bath" theory.[3] These write-offs can be blamed on previous management. In the second and third years of their careers, CEOs delay write-offs due to career concerns. In the last year of service, CEOs also record fewer write-offs which is consistent with the horizon problem (Brickley, Linck and Coles, 1999).

Tenure affects the CEO's incentives to delay impairment in multiple ways. In their early years, CEOs have more incentives to delay impairments because of career development concerns (Ali and Zhang, 2015), while longer-tenured CEOs are more likely to take reputation damage (Milbourn, 2003; Beatty and Weber, 2006). In addition, new CEOs have financial incentives to delay impairments, while established CEOs do not (Darrough et al., 2014). Since short-tenured CEOs have compensational incentives and career concerns, it is expected that responsible CEOs with a short tenure have more incentives to not record impairments than responsible CEOs with a long tenure. Because of these arguments, the hypothesis is stated in the following way:

Hypothesis 2: The likelihood of an auditor being dismissed after recording a goodwill impairment is lower when the responsible CEO has a long tenure.

Testing this hypothesis provides new insights into how CEO tenure affects incentives to delay impairments and how it influences auditor dismissal following a goodwill write-off. Support for this hypothesis documents a CEO characteristic that can help stakeholders and regulators identify cases where auditor independence is likely reduced.

[3] In Section 6.2., models are estimated to test if new CEOs still exhibit big bath behaviour. I do not find that CEOs impair goodwill significantly more often in their first year. If new CEOs want to impair goodwill, it is expected that they do not dismiss the auditor after recording an impairment. However, I also do not find evidence for this.

3. Research design

This section covers the methodology used to test the hypotheses. Two logistic regression models are discussed. The next paragraphs go over the dependent variable and the expected coefficients for the variables of interest. In addition, the control variables and the reasons why they are included are provided.

3.1. Hypothesis 1

To test Hypothesis 1, the following logistic regression model is estimated:

$$\begin{aligned} DISAGREE_{it+1} = {} & \beta_1\, IMPAIR_{it} + \beta_2\, RESPONSIBLE_{it} + \beta_3\, REV\_CHANGE_{it} + \\ & \beta_4\, INVREC_{it} + \beta_5\, ROA_{it} + \beta_6\, LOSS_{it} + \beta_7\, CASH_{it} + \beta_8\, ALTMAN_{it} + \\ & \beta_9\, LEVERAGE_{it} + \beta_{10}\, GOING\_CONCERN_{it} + \beta_{11}\, RESTATEMENT_{it} + \\ & \beta_{12}\, SHORT\_AU\_TENURE_{it} + \beta_{13}\, LONG\_AU\_TENURE_{it} + \beta_{14}\, BIG4_{it} + \\ & \beta_{15}\, LN\_MARKETCAP_{it} + \beta_{16}\, MERGER_{it} + \beta_{17}\, RESTRUCTURE_{it} + IND\_FE + \\ & YEAR\_FE + \varepsilon_{it}, \end{aligned} \tag{1}$$

where i denotes firm, t denotes year, and ε denotes the error term. The dependent variable is DISAGREE which is an indicator variable taking a value of one if a firm dismisses its auditor after having a disagreement on a matter of accounting principle or practice, and zero otherwise. The variable of interest is RESPONSIBLE which is an indicator variable that captures the interaction between IMPAIR and CEO responsibility. IMPAIR is an indicator variable taking a value of one if the company impaired goodwill for more than 0.5 percent of revenue. This materiality threshold is chosen in line with existing research of Ayres et al. (2019) and Carcello et al. (2020) and is consistent with survey responses from eight of the nine largest US audit firms (Eilifsen and Messier Jr., 2015). RESPONSIBLE takes a value of one when goodwill gets impaired that originates from an M&A decision made under the currently sitting CEO. For some observations, it cannot be determined from which M&A decision the impaired goodwill originates because, for example, only the business segment to which the goodwill is allocated is mentioned in the 8-K or 10-K filing. In those cases, it is unclear if the goodwill acquired by the currently sitting CEO is impaired, or of his predecessor. Therefore, RESPONSIBLE only takes a value of one when with certainty can be concluded that the CEO is responsible for at

least twenty-five percent of the origination of the segment's impaired goodwill.[4] This threshold is chosen to prevent noise from impairments for which the CEO's predecessors can mostly be blamed for. As documented in Section 2.3, CEOs can also be responsible for the impairment when they mismanaged the acquired assets. Therefore, RESPONSIBLE takes a value of one when the currently sitting CEO has managed the acquired asset for over eight years. This period is chosen because only ten percent of the CEOs in the sample have a tenure of higher than eight years. If goodwill is impaired after the CEO has managed the assets for such a long time, it is likely that the CEO caused the impairment by mismanaging the assets. For every year, the dataset (see Section 4.1.) contains the amount of goodwill a firm has and how much goodwill is impaired. However, it does not include a variable indicating in what year the impaired goodwill is acquired. This is therefore manually checked and then linked to the CEO of that year. When an impairment occurs, the interaction effect captures an additional effect if the currently sitting CEO is responsible for the impairment. In line with existing research, impairments are matched with dismissals in the following year (Lazer, Livnat and Tan; 2004; Mande and Son, 2013; Ayres et al., 2019). This rules out the possibility that the goodwill impairment has occurred under the new auditor. Based on research of Ayres et al. (2019), b1 is expected to be positive and statistically significant. As described in Section 2.5., Beatty and Weber (2006) and Darrough et al. (2014) find that management is held accountable for the poor M&A decision and/or for mismanaging the acquired asset. It is therefore expected that b2 is also positive and significant.

In line with existing literature, the estimated model controls for the audit risk, financial risk and other factors that influence auditor dismissal (Mande and Son, 2013). Landsman, Nelson and Rountree (2009) document that a higher audit and financial risk increases the likelihood of auditor changes. The audit risk is the risk that financial statements are materially misstated, even though the auditor issues a clean opinion. REV_CHANGE and INVREC are included because the audit risk increases when a company has high revenue growth and/or has a significant amount of inventory and receivables relative to its total assets (Johnson, Khurana and Reynolds, 2002). REV_CHANGE also controls for the fact that high-growth firms are

[4] For example, the goodwill of the segment increases from fifty to one hundred under the CEO's leadership and then gets impaired for eighty. With certainty can be concluded that, even if all the goodwill of the previous CEO is impaired, the currently sitting CEO is responsible for at least 37.5 percent (30 / 80 = 0.375) of the impaired goodwill.

more likely to engage in acquisitions resulting in goodwill that can potentially be impaired (Reynolds, Deis and Francis, 2004).

Controls are included for the financial risk because less profitable firms are more likely to change auditors (Landsman et al., 2009; Cassell, Giroux, Myers and Omer, 2012). To control for the financial risk, proxies for firm profitability are included. Higher levels of return on assets (ROA) indicate lower financial risk. In line with Gu and Lev (2011), ROA is calculated as the company's pre-impairment net income divided by its average total assets. Having a loss before impairment (LOSS), lower amounts of cash relative to total assets (CASH), financial distress (ALTMAN), and/or large amounts of debt relative to equity (LEVERAGE) indicate higher financial risk (Johnstone and Bedard, 2004; Schloetzer, 2007).

In addition, controls are included to control for auditor characteristics. GOING_CONCERN and RESTATEMENT are indicator variables that take a value of one when, respectively, the auditor issues a going-concern opinion or when financial statements are restated or announced to be restated. The occurrence of both events is unfavourable for companies and is therefore expected to increase the likelihood of dismissal (Geiger, Raghunandan and Rama, 1998). In addition, indicator variables for auditor tenure are added because either having a short tenure (SHORT_AU_TENURE) or long tenure (LONG_AU_TENURE) is expected to influence the likelihood of dismissal (Hennes, Leone and Miller, 2014). In line with Mande and Son (2013), a short tenure is fewer than four years, while a long tenure is more than eight years. SHORT_AU_TENURE also controls for the audit risk as Johnson et al. (2002) document that firms with a short relationship with their auditor issue lower-quality financial reports. BIG4 is an indicator variable that captures whether the company engaged a Big 4 auditor and is included to control for the type of auditor.

In addition, firm and event-specific controls are included. DeAngelo (1981) documents that larger firms have higher switching costs and are therefore less likely to change auditors. To control for the difference in auditor change rates based on firm size, the natural logarithm of the market value of equity (LN_MARKETCAP) is included. MERGER is an indicator variable included to control for auditor changes as a result of a merger (Landsman et al., 2009). RESTRUCTURE is an indicator variable included because reorganisations can affect management's decision to switch auditors (Jarva, 2014; Ayres et al., 2019).

3.2. Hypothesis 2

To test Hypothesis 2, the following logistic regression model is estimated:

$$
\begin{aligned}
DISAGREE_{t+1} = {} & \beta_1\, IMPAIR_{it} + \beta_2\, RESPONSIBLE_{it} + \\
& \beta_3\, SHORT\_CEO\_TENURE_{it} + \beta_4\, IMPAIR_{it} * SHORT\_CEO\_TENURE_{it} + \\
& \beta_5\, RESPONSIBLE_{it} * SHORT\_CEO\_TENURE_{it} + \beta_6\, LONG\_CEO\_TENURE_{it} + \\
& \beta_7\, IMPAIR_{it} * LONG\_CEO\_TENURE + \beta_8\, RESPONSIBLE_{it} * \\
& LONG\_CEO\_TENURE + \beta_9\, REV\_CHANGE_{it} + \beta_{10}\, INVREC_{it} + \beta_{11}\, ROA_{it} + \\
& \beta_{12}\, LOSS_{it} + \beta_{13}\, CASH_{it} + \beta_{14}\, ALTMAN_{it} + \beta_{15}\, LEVERAGE_{it} + \\
& \beta_{16}\, GOING\_CONCERN_{it} + \beta_{17}\, RESTATEMENT_{it} + \\
& \beta_{18}\, SHORT\_AU\_TENURE_{it} + \beta_{19}\, LONG\_AU\_TENURE_{it} + \beta_{20}\, BIG4_{it} + \\
& \beta_{21}\, LN\_MARKETCAP_{it} + \beta_{22}\, MERGER_{it} + \beta_{23}\, RESTRUCTURE_{it} + IND\_FE + \\
& YEAR\_FE + \varepsilon_{it},
\end{aligned}
\tag{2}
$$

where i denotes firm, t denotes year, and ε denotes the error term. The model contains the same dependent variable and control variables as equation (1) but differs because it contains three-way interaction effects. There is a three-way interaction because RESPONSIBLE is an interaction between IMPAIR and CEOs being responsible for the impairment. A CEO cannot be responsible when there is no impairment. Thus, the interaction between IMPAIR and SHORT_CEO_TENURE is a two-way interaction, while RESPONSIBLE and SHORT_CEO_TENURE is a three-way interaction. The variables of interest are the three-way interactions between RESPONSIBLE and SHORT_CEO_TENURE and LONG_CEO_TENURE. These interactions capture the change in the likelihood of an auditor getting dismissed after an impairment is recorded under a responsible CEO with a tenure in the first or fourth quartile, respectively. SHORT_CEO_TENURE takes a value of one when CEOs are in the first or second year of their career. Since short-tenured CEOs are never responsible because of having a tenure higher than eight years, they are only responsible in cases where I manually find that they made the M&A decision. LONG_CEO_TENURE takes a value of one when CEOs have a tenure higher than six years. This means that there is an overlap between LONG_CEO_TENURE and RESPONSIBLE. CEOs with a tenure of seven or eight years are responsible when they made the M&A decision whereas CEOs with a tenure of higher than eight years are responsible because of the tenure criterion.

Beatty and Weber (2006) and Ramanna and Watts (2012) document that CEOs with a longer tenure have more incentives to delay goodwill impairments because they are more likely to take reputation damage. However, the cash compensation of experienced CEOs is not affected by goodwill write-offs while that of new CEOs is (Darrough et al., 2014). Ali and Zhang (2015)

document that CEOs' incentives to record write-offs changes over their tenure. In the first years, CEOs record fewer impairments because they want to favorably influence the market's perception of their ability. In their last year, CEOs also record fewer write-offs, which is in line with the horizon problem (Brickley et al., 1999). Thus, tenure has different effects on CEOs' incentives to delay impairments. Because of the compensational incentives and career concerns, the coefficient for the interaction between RESPONSIBLE and SHORT_CEO_TENURE is expected to be significantly higher than for the interaction between RESPONSIBLE and LONG_CEO_TENURE.

The estimated models include both industry (IND_FE) and year (YEAR_FE) fixed effects to control for differences in auditor switch rates across industries and time periods. The 48 industry classifications developed by Fama and French (1997) are used. All variables are more extensively defined in Appendix A.

4. Data

This section describes the sources of the panel data used. The sample selection is provided, and summary statistics are analysed and split between impairing and non-impairing firms. In addition, three figures are provided to illustrate (i) the frequency of goodwill impairments, (ii) the relative size of goodwill impairments, and (iii) the change in auditor dismissals over the sample period.

4.1. Data sources

SFAS 142 went into effect for US companies with fiscal years beginning on or after December 15, 2001. Therefore, the sample includes companies with fiscal years beginning on January 1, 2002 and ending by December 31, 2019. Three types of panel data are used to analyse the relation between CEO responsibility for goodwill impairments and auditor dismissals, namely, firm financial data, CEO data, and auditor data. Firm financial and CEO data are obtained from COMPUSTAT for fiscal years between 1992 and 2019. The period prior to the introduction of SFAS 142 is used to conduct CEO tenure and CEO responsibility. COMPUSTAT does not provide CEO data before 1992, therefore, financial data is also not used before this date. COMPUSTAT Execucomp only contains 3,848 unique companies while the firm financial data, after dropping missing observations, contains 7,641 unique companies. Therefore, two additional datasets with CEO data are used, namely, BoardEx and Institutional Shareholder Services. Auditor data is retrieved from Audit Analytics between 2003 and 2020. Fiscal year 2002 is not included while 2020 is added because dismissals are matched with impairments of

the prior year. Auditor dismissals and changes are not investigated prior to the introduction of SFAS, therefore, no data before 2003 is used. Finally, for firms where the CEOs' tenure is not higher than eight years, 8-K and 10-K filings are examined to determine if a CEO is responsible for the acquisition.

4.2. Sample selection

Table 1 describes in detail how the sample is constructed. To be included in the sample, observations must contain all requisite firm, CEO, and auditor data. Even though two additional CEO datasets are used, there still is a large decrease in observations because of missing CEO data. Since the focus is on whether the CEO is responsible for the goodwill impairment, the sample is limited to companies that have goodwill. More specifically, the sample only includes companies with pre-impairment goodwill larger than 0.5 percent of revenue. This eliminates noise caused by goodwill impairments that are not significant for companies. Firms within industries that have no variation in impairment outcome are also dropped because variation is required to estimate a logit model. The final sample contains 20,230 firm years of 2,934 different companies.

Table 1 Sample selection

	Observations
Companies with all required COMPUSTAT firm financial data	84,638
Less:	
Observations without necessary CEO data	(55,042)
Observations with goodwill smaller than 0.5 percent of revenue	(8,809)
Observations operating in industries with no variation in impairment outcome	(528)
Observations without necessary auditor data	(29)
Total observations meeting full sample criteria	***20,230***

4.3. Descriptive statistics

Table 2 presents the descriptive statistics. All continuous variables are winsorized at the 1st and 99th percentiles to minimize the influence of potential extreme observations (Beatty and Weber, 2006). This allows for a better interpretation of the mean and standard deviation in the descriptive statistics.

The mean of DISAGREE is 0.006 which is significantly lower than in the samples of existing research of Ettredge, Scholtz and Li (2007) and Mande and Son (2013) who have dismissal

Table 2 Descriptive statistics

Variable	*N*	Mean	Median	Std. Dev.	min	max
Panel A: Variables used in primary analyses						
DISAGREE	20,230	0.006	0.000	0.079	0.000	1.000
CHANGE	20,230	0.022	0.000	0.146	0.000	1.000
IMPAIR	20,230	0.094	0.000	0.292	0.000	1.000
RESPONSIBLE	20,230	0.036	0.000	0.187	0.000	1.000
SHORT_CEO_TENURE	20,230	0.234	0.000	0.423	0.000	1.000
LONG_CEO_TENURE	20,230	0.294	0.000	0.456	0.000	1.000
REV CHANGE	20,230	11.032	7.159	25.905	-45.624	144.567
INVREC	20,230	0.243	0.222	0.156	0.012	0.701
ROA	20,230	0.021	0.046	0.137	-0.711	0.264
LOSS	20,230	0.208	0.000	0.406	0.000	1.000
CASH	20,230	0.124	0.087	0.119	0.001	0.560
ALTMAN	20,230	1.069	1.208	1.720	-7.461	4.963
LEVERAGE	20,230	0.656	0.332	2.339	0.000	14.957
GOING_CONCERN	20,230	0.004	0.000	0.065	0.000	1.000
RESTATEMENT	20,230	0.045	0.000	0.207	0.000	1.000
SHORT_AU_TENURE	20,230	0.439	0.000	0.496	0.000	1.000
LONG_AU_TENURE	20,230	0.195	0.000	0.396	0.000	1.000
BIG4	20,230	0.845	1.000	0.362	0.000	1.000
LN_MARKETCAP	20,230	7.096	7.116	1.954	2.467	11.767
MERGER	20,230	0.293	0.000	0.455	0.000	1.000
RESTRUCTURE	20,230	0.438	0.000	0.496	0.000	1.000
Panel B: Variables used in additional analyses						
CEO_DISMISSAL	20,230	0.097	0.000	0.296	0.000	1.000
NEW_CEO	20,230	0.165	0.000	0.328	0.000	1.000
REL_IMPAIR_TA	20,230	0.001	0.000	0.012	0.000	0.436
REL_IMPAIR_GW	20,230	0.035	0.000	0.139	0.000	0.996

Notes: This table presents the descriptive statistics for the full sample of observations. A detailed definition of all variables is provided in Appendix A.

rates of 9.48 percent and 6.02 percent, respectively. Both authors, however, use auditor change as a proxy for auditor dismissal. This paper uses Audit Analytics' definition which is stricter. DISAGREE only takes a value of one when an auditor change is classified as a dismissal in the filings and when the company and auditor had a disagreement on a matter of accounting principle or practice. Hennes et al. (2014) study the effects of financial restatements on auditor dismissals. The authors create a dataset by manually checking 8-K filing announcements to document whether the audit departure describes the change in auditor as a resignation or dismissal. However, they also notice that this method is not perfect because firms can falsely claim a dismissal if this favours them. In their sample, they find an auditor dismissal rate of 10.7 percent. However, the sample only contains observations with a significant restatement. Restatements are often followed by auditor dismissals (Mande and Son, 2013; Ayres et al., 2019). It therefore makes sense that their sample contains a higher dismissal rate. The sample in this paper does not only include impairment firms, which have higher auditor dismissal rates

(Ayres et al., 2019), but also non-impairment firms. Thus, the lower mean of DISAGREE in this paper can be explained by the definition used and the difference in sample requirements.

While there are relatively few dismissals because of a disagreement observations (125), it is expected that this variable is better able to capture the relation between the impairment and dismissal than using any change in auditor. Ettredge et al. (2007) and Mande and Son (2013) use any change in auditor because these changes also include auditors being fired as a punishment for recording the impairment. Auditor changes occur significantly more often than dismissals (Hennes et al., 2014; Ayres et al., 2019). Some of the auditor changes therefore have nothing to do with the impairment and thus add unwanted noise. A dismissal after having a disagreement on the accounting principle or practice can more safely be linked to the impairment, especially because these disagreements occur more frequently on accounting standards with more discretion, such as goodwill (see Section 2.4.). Because there is less noise when using the variable DISAGREE, it is expected that a cleaner estimate of the relationship can be obtained.[5]

The mean of indicator variable CHANGE is higher than that of DISAGREE because it includes all auditor changes and not only dismissals as a result of a disagreement. The indicator variable IMPAIR has a mean of 0.094 which means that 9.4 percent of the observations record an impairment. This is in line with Ayres et al. (2019) who have an impairment rate of 9.1 percent. SHORT_CEO_TENURE and LONG_CEO_TENURE are indicator variables that take a value of one when the CEO's tenure is in the first or fourth quartile, respectively. Both means are not exactly 0.250 due to the nature of the CEO tenure variable.

The mean of RESPONSIBLE in table 2 is 0.036, which does not mean that only 3.6 percent of the CEOs included in the sample made the M&A decision or have a tenure higher than eight years. RESPONSIBLE only takes a value of one when both an impairment occurs, and the CEO is responsible. In order to better interpret the mean, table 3 is created which contains only observations that recorded an impairment and splits the remaining sample based on whether the CEO is responsible for the impaired goodwill. The first two columns present the observation count and mean for non-responsible impairments. The third and fourth columns

[5] There are concerns that DISAGREE does not capture all dismissals because firms and auditors do not want to publicly state that they had a disagreement. The variable CHANGE does include these dismissals. Therefore, all the models are also estimated using CHANGE as the dependent variable (see Section 6.4.). Similar results are found.

Table 3 Comparative descriptive statistics

	RESPONSIBLE = 0		RESPONSIBLE = 1			
Variable	*N*	Mean	*N*	Mean	Difference	*t*-statistic
DISAGREE	1,165	0.012	738	0.018	0.006	-0.989
CHANGE	1,165	0.032	738	0.038	0.006	-0.710
SHORT_CEO_TENURE	1,165	0.441	738	0.053	-0.388	19.990***
LONG_CEO_TENURE	1,165	0.054	738	0.673	0.619	-38.533***
REV_CHANGE	1,165	0.470	738	3.132	2.662	-2.104**
INVREC	1,165	0.247	738	0.248	0.001	-0.166
ROA	1,165	-0.180	738	-0.099	0.081	-7.980***
LOSS	1,165	0.515	738	0.360	-0.155	6.761***
CASH	1,165	0.124	738	0.106	-0.018	3.305***
ALTMAN	1,165	-0.127	738	0.497	0.624	-6.932***
LEVERAGE	1,165	0.739	738	0.778	0.039	-0.291
GOING CONCERN	1,165	0.013	738	0.005	-0.008	1.903*
RESTATEMENT	1,165	0.037	738	0.055	0.018	-1.834*
SHORT_AU_TENURE	1,165	0.587	738	0.259	-0.328	-15.146***
LONG_AU_TENURE	1,165	0.111	738	0.256	0.145	-7.992***
BIG4	1,165	0.808	738	0.817	0.009	-0.493
LN_MARKETCAP	1,165	5.823	738	6.561	0.738	-7.767***
MERGER	1,165	0.186	738	0.380	0.194	-9.356***
RESTRUCTURE	1,165	0.576	738	0.601	0.025	-1.093

Notes: This table only includes observations that recorded a goodwill impairment. The table provides the descriptive comparison for observations where the CEO is not responsible for the impairment (RESPONSIBLE = 0) and observations where the CEO is responsible for the impairment (RESPONSIBLE = 1). The last column presents the *t*-statistics of the difference between the two subsamples. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests). All variables are defined in Appendix A.

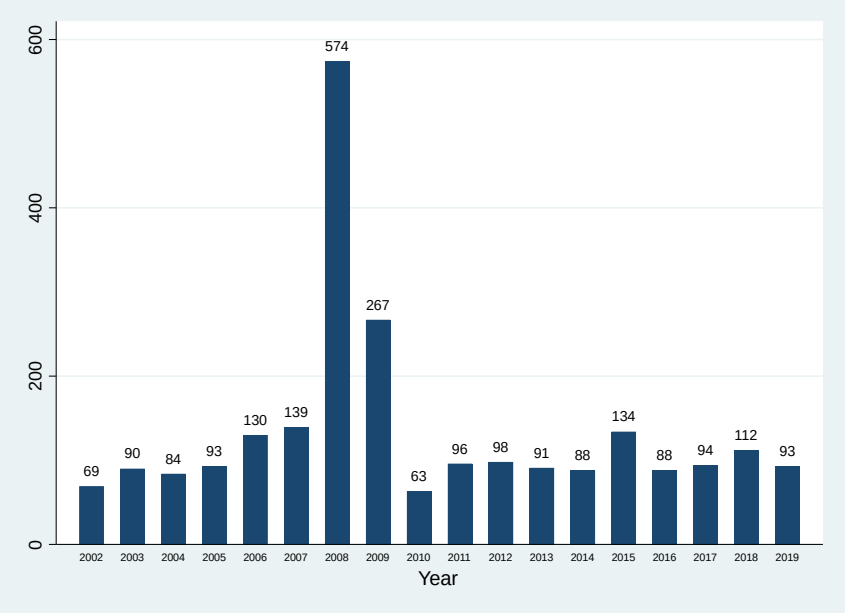
display this for observations where the CEO either made the M&A decision and/or has a tenure of more than eight years. Column (5) compares the means and column (6) displays the corresponding *t*-statistics. The not responsible sample has 1,165 observations, while the responsible sample has 738 observations. Roughly 39 percent of the CEOs in the sample are responsible. As predicted in Section 3.1, the subsample where CEOs are responsible has a higher mean of DISAGREE, as well as any change in auditor (CHANGE). However, the difference for both variables is not significant, meaning that, from a descriptive standpoint, there is no statistical difference between the subsamples in terms of the likelihood of dismissing or changing the auditor. This does not mean that the CEO's responsibility has no influence on the decision to dismiss the auditor because this analysis does not account for confounding variables. Furthermore, table 3 displays that CEOs with a short (long) tenure are less (more) likely to be responsible. Control variables have significantly different means between the subsamples. However, this does not seem to be a problem because both samples contain means that are more likely to cause an impairment. For example, while ROA and LOSS indicate more

impairments in the not responsible sample, a lower mean for ALTMAN indicates a lower chance of an impairment. In addition, the difference in the means is not likely to be caused by a CEO making an M&A decision or having a high tenure (i.e., being responsible for the impaired goodwill does not lead to a longer auditor tenure).

4.4. Sample illustration

Figure 1 illustrates the number of impairments for all years in the sample. The frequency of goodwill impairments seems to be relatively stable (ranging from 63 to 134). However, as documented in Li and Sloan (2017), significantly more goodwill impairments occurred during the financial crisis. Figure 2 reveals that not only the frequency increased during the financial crisis, but also the relative size of the goodwill impairments, calculated as the impairment divided by total assets. The relative size of the impairment decreased after the financial crisis and seems to have settled at a lower level than before the crisis.

Figure 1 Total impairments

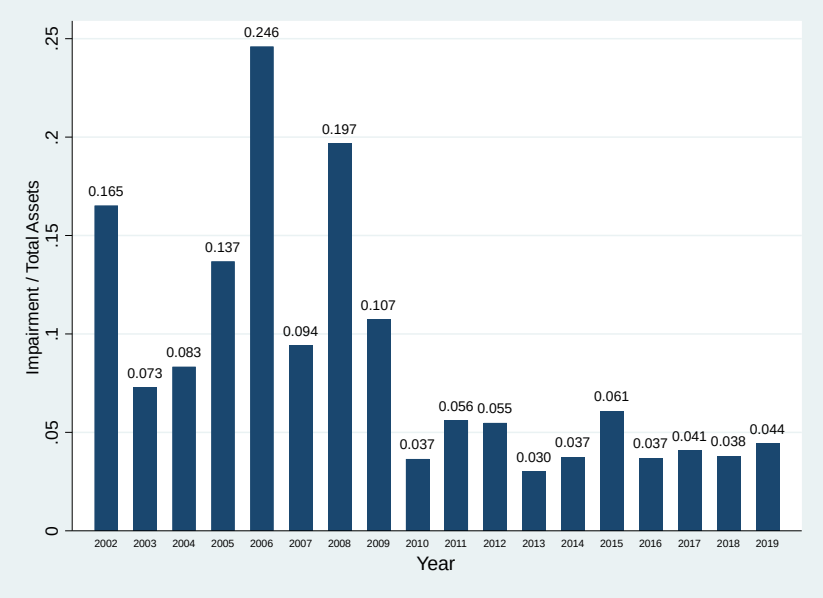


Note: Figure 1 illustrates the distribution of material goodwill impairments of the sample.

Figure 3 displays the number of auditor dismissals and changes per year. Again, there appears to be an increase during the financial crisis. It is expected that a lot of impairments in one year lead to significantly more auditor dismissals in the following year (Ayres et al., 2019). This relation cannot directly be observed when looking at figures 1 and 3 (e.g., high impairments during 2009, but low dismissals in 2010, and low impairments in 2016 but high dismissals in

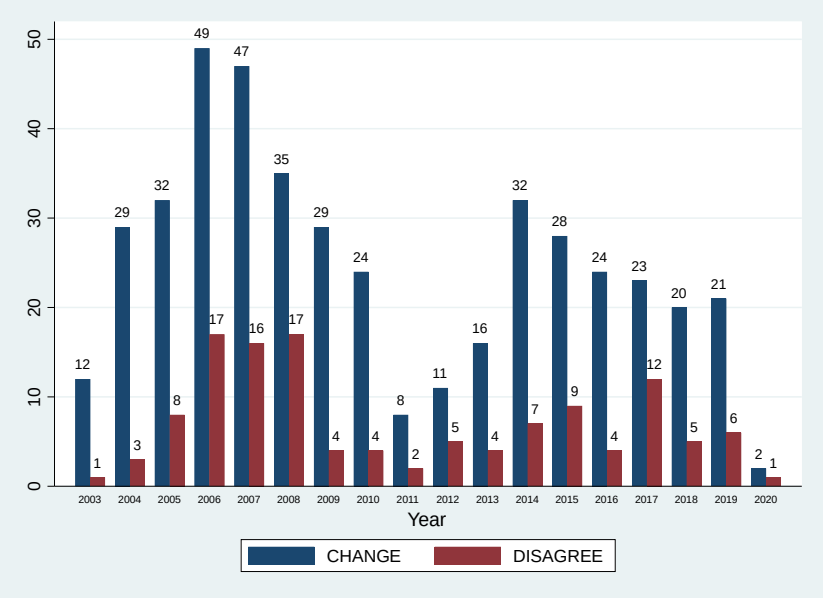
2017). A relation between the relative size of the impairment and auditor dismissal can also not directly be observed.[6]

Figure 2 Relative size of impairments



Note: Figure 2 illustrates the distribution of the relative size of material goodwill impairments of the sample.

Figure 3 Total auditor changes and dismissals



Note: Figure 3 illustrates how many times an auditor change or dismissal occurred per year.

[6] In Section 6.3., equation (1) is re-estimated replacing indicator variable IMPAIR by the relative size of the impairment. I find evidence that there is a positive and significant relation between the relative size of the impairment and the likelihood that an auditor is dismissed. However, the interaction between the relative size and CEO responsibility is insignificant.

5. Results

This section presents the results of estimating the equations discussed in Section 3. Average marginal effects are used to interpret the magnitude of the coefficients. Both a statistically, as well as an economically, significant relation between CEO responsibility and the dismissal of an auditor is found. No evidence is found that there is a relation between CEO tenure and auditor dismissals.

5.1. Hypothesis 1

Table 4 displays in column (1) the results of estimating equation (1) without the interaction effect. Column (2) presents the results of equation (1). The model without the interaction effect is added to show that, similar to Ayres et al. (2019), the coefficient for IMPAIR is positive and significant (1.025, *p*-value = 0.000). Thus, using a more recent sample, I also document that firms dismiss their auditor as a punishment for recording a goodwill impairment (Ayres et al., 2019). For Hypothesis 1, the variable of interest is the RESPONSIBLE which captures whether a CEO is responsible for the impairment. Column (2) shows that the interaction is significant and positive (0.755, *p*-value = 0.049), meaning that CEOs that can be held responsible for the impairment are more likely to dismiss the auditor. The coefficient for IMPAIR is still positive and significant (0.658, *p*-value = 0.043), meaning that the interaction effect increases the likelihood of a dismissal even further. Therefore, there is statistically significant evidence consistent with Hypothesis 1. In line with existing literature (Beatty and Weber, 2006; Ramanna and Watts; 2012), the results indicate that responsible CEOs have more incentives to delay impairments than non-responsible CEOs.[7] Goodwill impairments can be retraced to the M&A decision (Olante, 2013). CEOs that made this decision can therefore be held accountable. As documented by Beatty and Weber (2006), managers have incentives to shield their reputations from the implications of a goodwill impairment.

To interpret the economic significance of the coefficient for RESPONSIBLE, average marginal effects are used (see Appendix B). The marginal effect is the change in the estimated probability that an auditor is dismissed, after changing a unit of an independent variable and while holding all other variables constant at their sample means (Mande and Son; 2013).

[7] As discussed in Section 2.7., CEOs have incentives to delay impairments in their final which is in line with the horizon problem. Given the measurement of RESPONSIBLE, the results could be driven by the final year earnings optimization incentives. To alleviate this concern, equation (1) is re-estimated in Section 6.5. while excluding observations where CEOs are in their final year.

Table 4 Auditor dismissal likelihood analysis

VARIABLES	(1) DISAGREE	(2) DISAGREE	(3) DISAGREE
IMPAIR	**1.025*** **	0.658**	0.004*
	(0.000)	(0.043)	(0.064)
RESPONSIBLE		**0.755** **	**0.008** **
		(0.049)	**(0.010)**
REV_CHANGE	-0.002	-0.002	-0.000
	(0.616)	(0.578)	(0.700)
INVREC	1.409**	1.391*	0.012**
	(0.046)	(0.050)	(0.016)
ROA	1.265	1.303	0.012*
	(0.214)	(0.208)	(0.093)
LOSS	0.342	0.355	0.003*
	(0.204)	(0.188)	(0.090)
CASH	0.360	0.391	0.001
	(0.671)	(0.645)	(0.778)
ALTMAN	-0.015	-0.016	-0.000
	(0.843)	(0.831)	(0.382)
LEVERAGE	-0.101	-0.099	-0.000
	(0.183)	(0.195)	(0.150)
GOING_CONCERN	1.428**	1.470**	0.026***
	(0.029)	(0.026)	(0.002)
RESTATEMENT	2.372***	2.354***	0.038***
	(0.000)	(0.000)	(0.000)
SHORT_AU_TENURE	0.478**	0.528**	0.003***
	(0.045)	(0.028)	(0.009)
LONG_AU_TENURE	0.356	0.356	0.002
	(0.239)	(0.241)	(0.273)
BIG4	0.018	0.045	-0.001
	(0.944)	(0.858)	(0.481)
LN_MARKETCAP	-0.232***	-0.238***	-0.001**
	(0.002)	(0.001)	(0.020)
MERGER	0.628***	0.608***	0.003**
	(0.005)	(0.007)	(0.010)
RESTRUCTURE	-0.519**	-0.524**	-0.003**
	(0.016)	(0.015)	(0.014)
Constant	Included	Included	Included
Industry fixed effects	Included	Included	Included
Year fixed effects	Included	Included	Included
Observations	20,230	20,230	20,230

Notes: This table presents the results of the models estimated to test Hypothesis 1. Column (1) displays the estimation of equation (1) without the interaction term and column (2) presents equation (1). Column (1) is included because it can be used to indicate the effect of including the indicator variable RESPONSIBLE. Column (3) displays equation (1) as a linear probability model. The dependent variable is DISAGREE. Bold text indicates

the coefficient for the variable of interest. All variables are defined in Appendix A. Industry- and year-specific intercepts are not reported for brevity. Cluster (company) robust *z*-statistics are presented in parentheses below each coefficient. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).

Logistic regressions ensure that predicted probabilities lie between 0 and 1. This means that marginal effects are not constant and are smaller when the probability is close to 0 or 1 and larger when close to 0.5 (Norton, Dowd and Maciejewski, 2019). The marginal effect analysis reveals that the unconditional probability of dismissing the auditor after a disagreement is 0.51 percent. For companies recording an impairment, the likelihood is 0.96 percent, which increases to 1.94 percent when the CEO is responsible for the goodwill impairment. This means that the chance of dismissing the auditor after having a disagreement increases by 102.08 percent when the CEO can be held accountable for the impairment. As a comparison, the average marginal effects of GOING_CONCERN and RESTATEMENT are 1.78 and 3,79 percentage points, respectively. Thus, the average marginal effects of GOING_CONCERN and RESTATEMENT are larger. Linear probability models can also be used to interpret the interaction term and have the advantage that the coefficients can directly be interpreted as the average marginal effect (Green, 1993). However, unlike logistic regressions, the functional form of a linear probability model is incorrectly specified, which in extreme cases can lead to a predicted probability higher than 100 percent. Column (3) displays the results of estimating equation (1) as a linear probability model. The coefficient for the interaction term RESPONSIBLE is 0.008 (*p*-value = 0.010), which can be interpreted as that the likelihood of being dismissed increases by 0.8 percentage points when a CEO is responsible for the impairment. Again, this means that the magnitude is lower than when a going concern opinion is issued (0.026, *p*-value = 0.002) or when a restatement is reported (0.038, *p*-value = 0.000).

As for the control variables, the variables that control for the audit risk have the expected sign. The coefficient for INVREC is positive and significant, 1.391 (*p*-value = 0.050), which is in line with Johnson et al. (2002) who document that a higher inventory and receivables to total asset ratio increases the audit risk. The coefficient for SHORT_AU_TENURE is positive and significant, 0.528 (*p*-value = 0.028), which can be explained by the fact that having a short relationship with the auditor increases the audit risk (Johnson et al., 2002). Consistent with Geiger et al. (1998), firms receiving a going concern opinion are more likely to dismiss the auditor (1.470, *p*-value = 0.026) as issuing a going-concern opinion can cause friction between the auditor and the client. In line with Mande and Son (2013), the coefficient for

RESTATEMENT is positive and significant, 2.354 (*p*-value = 0.000), because restating firms dismiss their auditors to increase audit quality and restore their reputation. In line with DeFond and Jiambalvo (1993), the coefficient for LN_MARKETCAP is negative and significant, -0.238 (*p*-value = 0.001), as larger firms have higher switching costs and therefore are less likely to change auditors. Restructuring firms dismiss their auditor less often, -0.524 (*p*-value = 0.015), which is unexpected since Jarva (2004) and Ayres et al. (2019) argue that firms that restructure are more likely to change auditors to obtain a fresh start.

To conclude, the coefficient for the interaction term RESPONSIBLE is significant and positive. In addition, the average marginal effect analysis shows that being responsible increases the likelihood of dismissing the auditor by 102.08 percent. Therefore, Hypothesis 1 is accepted because both statistical and economical significance is documented.

5.2. Hypothesis 2

Table 5 displays the results of estimating equation (2). For Hypothesis 2, the variables of interest are the interactions between RESPONSIBLE and SHORT_CEO_TENURE and LONG_CEO_TENURE. The coefficients for the interaction between RESPONSIBLE and both SHORT_CEO_TENURE and LONG_CEO_TENURE are insignificant (-1.513, *p*-value = 0.267 and 0.097, *p*-value = 0.928, respectively). The control variables have the same signs and roughly the same significance as in equation (1). Thus, adding the CEO tenure indicator variables does not affect the control variables. The untabulated Wald test shows that the coefficients for the interaction terms are not significantly different (*p*-value = 0.209). Thus, there is no statistical evidence in favor of Hypothesis 2.

As discussed in Section 2.5., Beatty and Weber (2006) use tenure as a proxy for CEO responsibility. However, tenure also affects CEOs' incentives to not record an impairment. Short-tenured CEOs have compensational incentives to not record impairments because they experience a reduction in their cash compensation (Darrough et al., 2014). Long tenured CEOs have their cash compensation shielded from impairments but want to shield their reputation from the implications of a goodwill write-off. Ali and Zhang (2015) document that there is a systematic pattern in the magnitude of write-offs over the career of a CEO. CEOs record significantly fewer write-offs at both the start and end of their careers. Therefore, it could be that the tenure variable in the models of Beatty and Weber (2006) is biased because it also captures other CEO incentives. This concern is somewhat alleviated by the fact that the coefficients for the two- and three-way interaction terms are insignificant and that no

Table 5 Relation CEO tenure and auditor dismiss likelihood

VARIABLES	(1) DISAGREE
IMPAIR	-0.064
	(0.932)
RESPONSIBLE	1.100
	(0.188)
SHORT_CEO_TENURE	0.261
	(0.291)
IMPAIR * SHORT_CEO_TENURE	0.819
	(0.331)
RESPONSIBLE * SHORT_CEO_TENURE	**-1.513**
	(0.267)
LONG_CEO_TENURE	0.019
	(0.947)
IMPAIR * LONG_CEO_TENURE	1.004
	(0.301)
RESPONSIBLE * LONG_CEO_TENURE	**0.097**
	(0.928)
REV_CHANGE	-0.002
	(0.511)
INVREC	1.407**
	(0.049)
ROA	1.396
	(0.181)
LOSS	0.383
	(0.154)
CASH	0.399
	(0.639)
ALTMAN	-0.020
	(0.798)
LEVERAGE	-0.101
	(0.198)
GOING_CONCERN	1.413**
	(0.037)
RESTATEMENT	2.344***
	(0.000)
SHORT_AU_TENURE	0.525**
	(0.032)
LONG_AU_TENURE	0.299
	(0.330)
BIG4	0.053
	(0.834)
LN_MARKETCAP	-0.240***
	(0.001)
MERGER	0.616***
	(0.006)
RESTRUCTURE	-0.543**
	(0.012)
Constant	Included

Industry fixed effects	Included
Year fixed effects	Included
Observations	20,230

Notes: This table presents the results of the estimated model to test Hypothesis 2. The dependent variable is DISAGREE. Bold text indicates the coefficients for the variables of interest. All variables are defined in Appendix A. Industry- and year-specific intercepts are not reported for brevity. Cluster (company) robust *z*-statistics are presented in parentheses below each coefficient. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).

significant difference between the interaction terms is found. While controlling for responsibility, the results show that tenure has no significant effect on the likelihood of an auditor getting dismissed. A potential explanation for this is that the incentives to delay of short and long-tenured CEOs cancel each other out.

To conclude, the coefficient for the interaction between IMPAIR and SHORT_CEO_TENURE is not significantly larger than for the interaction between IMPAIR and LONG_CEO_TENURE. Therefore, no evidence is found that CEO tenure, through compensational and career development incentives, affects the likelihood of responsible CEOs dismissing the auditor. Because of these findings, Hypothesis 2 is rejected.

6. Additional analyses and robustness tests

Additional models are estimated to identify a new CEO incentive to delay impairments and to extend existing literature on big bath accounting. No evidence is found that the likelihood of an auditor being dismissed is affected by the interaction between CEO responsibility and the relative size of the impairment. To alleviate concerns that the documented relationship only exists when using DISAGREE as the dependent variable, equations (1) and (2) are re-estimated using any change in auditor as the dependent variable. Finally, to show that the findings are not influenced by the horizon problem of departing CEOs, equation (1) is re-estimated excluding CEOs in their final.

6.1. CEO dismissal

As noticed in Section 2.5, CEOs have compensational and reputational incentives to delay impairments. Beatty and Weber (2006) and Ramanna and Watts (2012) do not investigate if CEOs have incentives to delay impairments because they fear being fired as a result of the impairment. It is difficult to identify CEO dismissals, therefore, many papers use datasets that

are hand collected by analyzing press articles and official company announcements (Flickinger, Wrage, Tuschke and Bresser, 2016). However, in March 2021, an open-source dataset is introduced documenting CEO dismissals for S&P 1500 firms from 2000 to 2018 (Gentry, Harrison, Quigley and Boivie; 2021). Using this dataset, the following model is estimated:

$$CEO\_DISMISSAL_{it+1} = \beta_1\, IMPAIR_{it} + \beta_2\, TENURE_{it} + \beta_3\, LOSS_{it} + \beta_4\, LN\_MARKETCAP_{it} + \beta_5\, ROA_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it}. \quad (3)$$

This model, shown in column (1) of table 6, follows the same methodology as the models described in Section 3. The coefficient of interest is IMPAIR which is positive and significant, 0.383 (*p*-value = 0.000), indicating that CEOs are significantly more often dismissed after the auditor records an impairment. Thus, statistical evidence of an additional CEO incentive to not record impairments is documented, namely, to not get fired. Average marginal effects show that the unconditional probability that a CEO is dismissed is 9.43 percent. When an impairment is recorded, the likelihood that the CEO is dismissed increases by 3.54 percentage points, representing a 37.5 percent increase. Column (2) shows equation (3) as a linear probability model. The coefficient for IMPAIR indicates that an impairment increases the likelihood of a CEO getting dismissed by 3.1 percent. As for the controls, Fredrickson, Hambrick and Baumrin (1988), predict in their model that CEOs with a higher tenure are more likely to be dismissed and that dismissals vary per industry and over time. Therefore, as expected, the coefficient for TENURE is positive and significant (0.072, *p*-value = 0.000). Furthermore, the sign and significance of the included firm size and profitability controls are in line with Wiersema and Zhang (2011) who find that larger firms are more likely to dismiss their CEO and that recording a loss increases the likelihood of a CEO being dismissed.

6.2. Big bath accounting

The theory of big bath accounting suggests that management writes off significant non-recurring items when earnings are low (Jordan and Clark, 2004). Since earnings are already depressed, the market punishes the company less for these charges. Thus, there are few downsides. However, there are significant upsides as future earnings are no longer burdened. This enables managers to achieve financial goals more easily in the future (Henry and Schmitt, 2001).

A particular area in which big bath earnings management is studied, is accounting for goodwill (Jordan and Clark, 2015). As mentioned in Section 2.5, goodwill accounting depends on management's discretion and can therefore more easily be used to take "big bath" charges

Table 6 CEO dismissal analysis

VARIABLES	(1) CEO_DISMISSAL	(2) CEO_DISMISSAL
IMPAIR	**0.383***** **(0.000)**	**0.031***** **(0.000)**
TENURE	0.072** (0.000)	-0.002*** (0.002)
LOSS	0.388*** (0.000)	0.033*** (0.000)
LN_MARKETCAP	0.064*** (0.000)	0.004*** (0.001)
ROA	0.074 (0.748)	0.005 (0.814)
Constant	Included	Included
Industry fixed effects	Included	Included
Year fixed effects	Included	Included
Observations	20,230	20,230

Notes: This table presents the results of the models estimated to test if CEOs also have incentives to delay impairments because they fear CEO dismissal. Equation (3) is displayed in column (1) as a logistic regression and in column (2) as a linear probability model. The dependent variable is CEO_DISMISSAL. Bold text indicates the coefficient for the variable of interest. All variables are defined in Appendix A. Industry- and year-specific intercepts are not reported for brevity. Cluster (company) robust *z*-statistics are presented in parentheses below each coefficient. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).

(Jordan and Clark, 2004). Kirschenheiter and Melumad (2002) find evidence that big bath accounting is used as an earnings management tool. Jordan and Clark (2004) document that specifically goodwill impairments are used to manage earnings in the introduction period of SFAS 142. New CEOs are more likely to exhibit big bath behaviour as they can blame their predecessor for the poor acquisition (Lapointe-Antunes, Cormier and Magnan, 2008; Masters-Stout et al., 2008). Jordan and Clark (2004) and Lapointe-Anthunes et al. (2008) document that managers practiced big bath earnings management by recording goodwill impairments in 2002, the initial year of the adoption of SFAS 142. Darrough et al. (2014) and Ali and Zhang (2015) also document that new CEOs write off significantly more goodwill in their first year of service. Jordan and Clark (2015) restudy whether new CEOs still exhibit big bath behaviour, as the US went through significant economic changes since the introduction of SFAS 142. They find that new CEOs do not impair goodwill more frequently and do not record larger write-offs. In

addition, goodwill impairments by new CEOs are justified by the firm's financials and thus are not used to manage earnings downwards.

Existing research finds mixed results on whether new CEOs perform big bath earnings management. Equations (1) and (2) do not include variables to control for new CEOs applying big bath accounting. Equations (4) and (5) are estimated to (i) make sure that the findings in Section 6 are not subject to omitted variable bias (i.e., new CEOs are not responsible and might impair more goodwill) and (ii) extent on the literature of new CEOs performing big bath earnings management by impairing goodwill. Equation (4) is estimated to research if new CEOs record more goodwill impairments and goes as follows:

$$\begin{aligned} IMPAIR_{it+1} = {} & \beta_1\, NEW\_CEO_{it} + \beta_2\, REV\_CHANGE_{it} + \beta_3\, INVREC_{it} + \\ & \beta_4\, ROA_{it} + \beta_5\, LOSS_{it} + \beta_6\, CASH_{it} + \beta_7\, ALTMAN_{it} + \beta_8\, LEVERAGE_{it} + \\ & \beta_9\, GOING\_CONCERN_{it} + \beta_{10}\, RESTATEMENT_{it} + \beta_{11}\, SHORT\_AU\_TENURE_{it} + \\ & \beta_{12}\, LONG\_AU\_TENURE_{it} + \beta_{13}\, BIG4_{it} + \beta_{14}\, LN\_MARKETCAP_{it} + \\ & \beta_{15}\, MERGER_{it} + \beta_{16}\, RESTRUCTURE_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it}, \end{aligned} \quad (4)$$

where IMPAIR is the dependent variable taking a value of one when goodwill is impaired. NEW_CEO is the variable of interest taking, in line with Lapointe-Antunes et al. (2008), a value of one if there is a CEO change in the year preceding the impairment. The same controls as in equations (1) and (2) are included. If new CEOs perform big bath earnings management, then it is expected that b1 is positive and significant.

Equation (5) is estimated to research if impairments made under a new CEO lead to fewer auditor dismissals and goes as follows:

$$\begin{aligned} DISAGREE_{it+1} = {} & \beta_1\, IMPAIR_{it} + \beta_2\, IMPAIR_{it} * NEW\_CEO_{it} + \\ & \beta_3\, REV\_CHANGE_{it} + \beta_4\, INVREC_{it} + \beta_5\, ROA_{it} + \beta_6\, LOSS_{it} + \beta_7\, CASH_{it} + \\ & \beta_8\, ALTMAN_{it} + \beta_9\, LEVERAGE_{it} + \beta_{10}\, GOING\_CONCERN_{it} + \\ & \beta_{11}\, RESTATEMENT_{it} + \beta_{12}\, SHORT\_AU\_TENURE_{it} + \\ & \beta_{13}\, LONG\_AU\_TENURE_{it} + \beta_{14}\, BIG4_{it} + \beta_{15}\, LN\_MARKETCAP_{it} + \\ & \beta_{16}\, MERGER_{it} + \beta_{17}\, RESTRUCTURE_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it}, \end{aligned} \quad (5)$$

This model is similar to equation (1) but differs in the interaction term. Instead of RESPONSIBLE, the indicator variable NEW_CEO is included. As documented in Section 5.1., an impairment increases the likelihood of an auditor being dismissed. The interaction between IMPAIR and NEW_CEO is expected to be negative and thus to reduce the likelihood of the

auditor being dismissed because, according to the big bath theory, NEW_CEOs have incentives to record impairments. If new CEOs want to impair goodwill, it is expected that they do not dismiss the auditor after recording an impairment.

Table 7 displays the results of estimating equations (4) and (5). In column (1), the coefficient for NEW_CEO is insignificant (*p*-value = 0.118). This is noteworthy as Lapointe-Antunes et al. (2008) and Masters-Stout et al. (2008) document that goodwill impairments occur significantly more frequently after a CEO change. Thus, using a more recent sample, no evidence is found that new CEOs impair goodwill more often. The interaction between IMPAIR and NEW_CEO in column (2) is also insignificant (*p*-value = 0.676), meaning that whether the goodwill gets impaired under a new CEO does not influence the likelihood of an auditor being dismissed. This is unexpected as the big bath theory predicts that new CEOs want to impair goodwill and therefore would dismiss the auditor less often. Taken together, the results provide some evidence that new CEOs do not exhibit big bath behaviour.

Research from Lapointe et al. (2008) and Masters-Stout et al. (2008) takes place in the adoption year 2002 and the period 2003 till 2005, respectively. When limiting the sample to these three years, evidence in favor of the big bath accounting theory is found. New CEOs impair goodwill significantly more often (p-value = 0.064), but the interaction between IMPAIR and NEW_CEO is still insignificant (p-value = 0.248). Since big bath behaviour is somewhat documented in these three years, it could be that it has subsided during the last decade.

6.3. Relative size of impairment

To test whether impairing higher relative amounts of goodwill leads to more relational problems, the models displayed in Section 5.1. are re-estimated replacing IMPAIR by (i) the ratio of the impaired goodwill divided by total assets pre-impairment (REL_IMPAIR_TA) and (ii) the ratio of the impaired goodwill divided by total goodwill pre-impairment (REL_IMPAIR_GW). In the untabulated results, the coefficient for REL_IMPAIR_TA is positive and significant using both DISAGREE and CHANGE as the dependent variables (*p*-values are 0.000 and 0.001, respectively). The coefficient REL_IMPAIR_GW is positive and significant using DISAGREE as the dependent variable (*p*-value = 0.093) but insignificant using CHANGE as the dependent variable (*p*-value = 0.164). The interaction between RESPONSIBLE and both REL_IMPAIR_TA and REL_IMPAIR_GW is insignificant using DISAGREE or CHANGE as the dependent variable (*p*-values are 0.514 and higher). Thus, these findings indicate that the relative magnitude of the goodwill impairment does affect the

Table 7 Big bath analysis

VARIABLES	(1) IMPAIR	VARIABLES	(2) DISAGREE
NEW_CEO	**0.112**	IMPAIR	0.990***
	(0.118)		(0.000)
		NEW_CEO	-0.115
			(0.738)
		IMPAIR * NEW_CEO	**0.255**
			(0.676)
REV_CHANGE	-0.019***	REV_CHANGE	-0.002
	(0.000)		(0.610)
INVREC	0.059	INVREC	1.409**
	(0.784)		(0.046)
ROA	-8.890***	ROA	1.276
	(0.000)		(0.210)
LOSS	-0.158**	LOSS	0.344
	(0.033)		(0.202)
CASH	-1.470***	CASH	0.358
	(0.000)		(0.673)
ALTMAN	0.348***	ALTMAN	-0.016
	(0.000)		(0.831)
LEVERAGE	0.017	LEVERAGE	-0.100
	(0.132)		(0.185)
GOING_CONCERN	-0.240	GOING_CONCERN	1.443**
	(0.479)		(0.027)
RESTATEMENT	0.096	RESTATEMENT	2.373***
	(0.401)		(0.000)
SHORT_AU_TENURE	-0.182***	SHORT_AU_TENURE	0.480**
	(0.004)		(0.044)
LONG_AU_TENURE	0.084	LONG_AU_TENURE	0.357
	(0.271)		(0.238)
BIG4	0.255***	BIG4	0.018
	(0.001)		(0.942)
LN_MARKETCAP	-0.148***	LN_MARKETCAP	-0.232***
	(0.000)		(0.002)
MERGER	0.153**	MERGER	0.630***
	(0.015)		(0.005)
RESTRUCTURE	0.485***	RESTRUCTURE	-0.519**
	(0.000)		(0.016)
Constant	Included	Constant	Included
Industry fixed effects	Included	Industry fixed effects	Included
Year fixed effects	Included	Year fixed effects	Included
Observations	20,230	Observations	20,230

Notes: This table presents the results of estimating equations (4) and (5) in columns (1) and (2), respectively. The dependent variables are IMPAIR and DISAGREE. Bold text indicates the coefficients for the variables of interest. All variables are defined in Appendix A. Industry- and year-specific intercepts are not reported for brevity. Cluster (company) robust *z*-statistics are presented in parentheses below each coefficient. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).

firm's decision to dismiss or change auditors. However, no additional effect is documented when interacting the relative size of the impairment with CEO responsibility.

As for the additional analyses, the relative size of the impairment does not affect the likelihood of a CEO getting dismissed. In untabulated results, equation (3) is re-estimated while replacing the independent variable IMPAIR by REL_IMPAIR_TA and REL_IMPAIR_GW. For both models, the coefficients are insignificant (*p*-values are 0.120 and 0.756). In untabulated results, equation (4) is also re-estimated to investigate if new CEOs impair relatively more goodwill. For this, also no evidence is found.

6.4. Auditor change

As discussed in Section 4.3., it is expected that the variable DISAGREE contains less noise than CHANGE, which allows for a cleaner estimate of the relation between CEO responsibility and auditor dismissal. However, existing literature mostly uses any change in auditors as the dependent variable (e.g., Ettredge et al., 2007; Mande and Son, 2013). The variable CHANGE has the advantage that it captures all dismissals as a result of relational problems. DISAGREE does not include all dismissals because firms and auditors may have incentives to not publicly state that the relationship was terminated because of a disagreement on an accounting principle.[8] Since there are arguments in favor and against both independent variables, the models presented in Sections 5 and 6 are also estimated using CHANGE as the dependent variable.

Table 8 in Appendix C displays in columns (1) and (2) the models discussed in Section 5.1 using CHANGE as the dependent variable. Using any change in auditor, the coefficient for IMPAIR remains significant and positive (0.385, *p*-value = 0.009). The coefficient for the interaction term RESPONSIBLE also stays positive and significant (0.575, *p*-value = 0.003). Thus, the findings in favor of Hypothesis 1 are robust to using any change in auditor as the dependent variable. Table 9 in Appendix C displays the model discussed in Section 5.2 using CHANGE as the dependent variable. The coefficients for the interactions between CHANGE and SHORT_CEO_TENURE and LONG_CEO_TENURE stay insignificant. Again, the untabulated Wald test does not find that the coefficients for the interaction terms are

[8] Another disadvantage of DISAGREE is that a dismissal because of a disagreement occurs only rarely. As a result, there is a potential bias in the estimated coefficients (King and Zeng, 2001). To alleviate this concern, equation (1) is re-estimated using a rare events methodology. The coefficient for RESPONSIBLE remains positive and significant (0.695, *p*-value = 0.062).

significantly different (*p*-value = 0.515). Thus, the results are consistent when using CHANGE as the dependent variable. As for the big bath behaviour analysis, equation (5) is re-estimated using CHANGE as the dependent variable. The coefficient for the interaction between IMPAIR and NEW_CEO remains insignificant (*p*-value = 0.859).

6.5. Horizon problem

Finally, as documented in Section 2.8., CEOs have incentives to delay impairments in their last year, which is consistent with the horizon problem (Brickley et al., 1999; Ali and Zhang, 2015). CEOs with a high tenure are more likely to be responsible than CEOs with a short tenure. To alleviate concerns that the coefficient for RESPONSIBLE is positive because it is correlated with the horizon incentive, equation (1) is re-estimated excluding CEOs in their final year. The untabulated coefficient for RESPONSIBLE stays positive and significant using either DISAGREE or CHANGE as the dependent variable (0.922, *p*-value = 0.033 and 0.563, *p*-value = 0.024).

7. Conclusion

This paper examines if relational challenges increase when the firm's CEO can be held responsible for the impairment. This section concludes the paper. In addition, limitations and recommendations for future research are provided.

7.1. Main results

As highlighted by the PCAOB inspection reports, auditors face significant challenges when auditing goodwill. Testing goodwill for impairment is commonly cited as an audit deficiency. Ayres et al. (2019) find that firms are more likely to dismiss their auditor after recording a goodwill impairment. As a result, auditors may have incentives to make biased decisions related to goodwill accounting.

Hypothesis 1 investigates whether CEOs that can be held responsible for the impairment are more likely to dismiss the auditor as a punishment for the write-off. By estimating logistic regressions, a statically and economically significant and positive relationship between being responsible and dismissing the auditor is documented.

Hypothesis 2 investigates how tenure affects the decision of responsible CEOs to dismiss the auditor. In their first years, CEOs have compensational and career development incentives to delay impairments. Because of these arguments, new CEOs could be more likely to dismiss the auditor after an impairment. However, no statistical evidence is documented for this.

This paper provides important insights to regulators and academics. The results show that relational challenges increase when the audited firm has a CEO who is responsible for the impairment. Thus, providing more evidence that auditors are not only technically challenged when auditing goodwill, but also face relational challenges. No evidence is found that there is a relation between CEO tenure and the likelihood of an auditor being dismissed. Relational challenges can lead to independence issues and increase the risk that goodwill is manipulated by management. The results of this paper can help investors and regulators to identify cases in which auditor independence is more likely reduced. While this paper only studies goodwill, the findings may be generalizable to other accounting items that use fair value. This is valuable as, over the last few decades, there has been an increasing trend in the use of fair value in accounting (Carcello et al., 2020).

Although not the primary focus of this paper, additional analyses reveal that CEOs are more likely to get laid off after an impairment is recorded. Thus, documenting an additional CEO incentive to delay impairments. Finally, research is performed on the big bath accounting theory, which predicts that CEOs want to impair goodwill in their first year. The results do not document that CEOs impair goodwill more often in their first year, nor do they show that new CEOs dismiss their auditor significantly less often following an impairment of goodwill. Existing goodwill literature uses the big bath theory to develop hypotheses and/or as a way of explaining their findings (Jarva, 2014; Ali and Zhang, 2015; Li and Sloan; 2017), which makes this a meaningful contribution.

7.2. Limitations and recommendations for future research

This paper considers CEOs responsible when they made the M&A decision and/or have a significantly long tenure. It does not consider whether the CEO had a prominent position in the firm before becoming CEO. This is a limitation as this can lead to partial responsibility because the CEO then could have had the power to stop the transaction and therefore may have incentives to not record the impairment. This problem can be tackled by specifying whether the CEO is promoted internally or is hired externally. External CEOs cannot have stopped the transaction and can therefore not be responsible for the M&A decision. In addition, future research can also focus on CFOs, as they also have a significant influence on the M&A process and can therefore be held accountable (Ferris and Sainani, 2021).

Furthermore, this paper uses tenure as a proxy for mismanagement of the acquired assets. CEOs that have managed the assets for over eight years are likely to have mismanaged them when

they are impaired. However, this measurement does understate RESPONSIBLE as CEOs with a tenure of less than nine years can also mismanage the assets. Future research can explore better measurements, for example, by looking into media criticism or by comparing firm performance to peers. CEOs likely mismanage assets when the firm structurally underperforms the benchmark. In addition, RESPONSIBLE is understated as for some goodwill impairments it could not be determined whether the currently sitting CEO made the M&A decision. It is also recommended to include identifiers for when the CEO did acquire the assets, but the impairment occurred for something out of his control.

As for the additional analyses, Jordan and Clark (2015) find evidence that first-year CEOs do not exhibit big bath behaviour when impairing goodwill. Using a different methodology, this paper supports this find. As discussed in Section 7.1., big bath accounting is frequently used in existing literature which makes it an important theory. Future research should investigate if new CEOs truly stopped using goodwill impairments as an earnings management tool.

8. Appendix

Appendix A

Variable descriptions

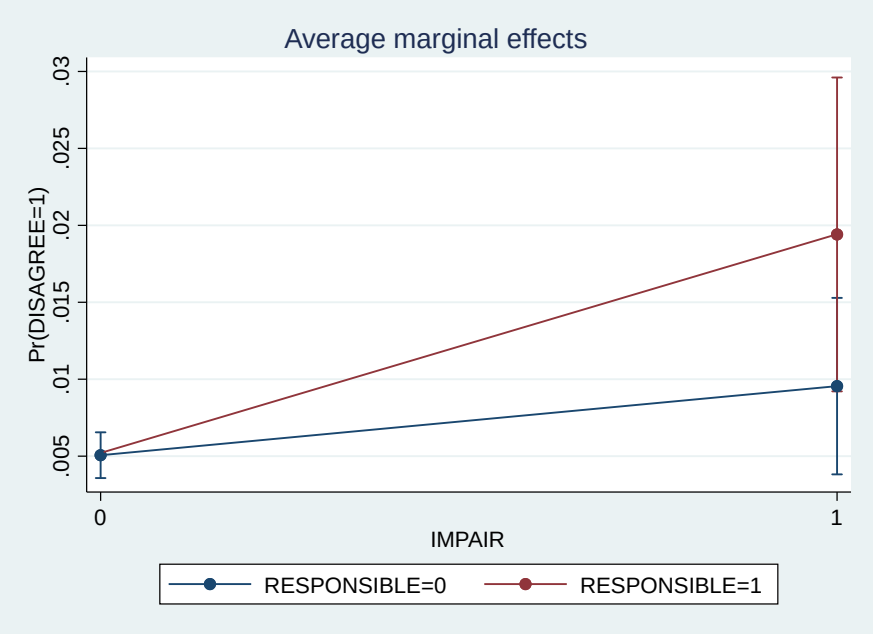
Variable	Definition
ALTMAN	Financial distress score calculated using updated Altman Z-score coefficients from Shumway (2001)
BIG4	Indicator taking a value of one if the company is audited by a Big 4 firm, zero otherwise
CASH	Ratio of total cash divided by total assets
CEO_DISMISSAL	Indicator taking a value of one if the company dismisses its CEO, zero otherwise
CHANGE	Indicator taking a value of one if the company changed its auditor, zero otherwise
DISAGREE	Indicator taking a value of one if the company dismissed its auditor because of a disagreement, zero otherwise
GOING_CONCERN	Indicator taking a value of one if the auditor gives a going concern opinion, zero otherwise
IMPAIR	Indicator variable taking a value of one if the company records a material goodwill impairment during the fiscal year (larger than 0.5 percent of the total revenue), zero otherwise
INVREC	Ratio of total receivables and inventory divided by total assets
LEVERAGE	Ratio of total short- and long-term interest-bearing debt divided by the pre-impairment book value of equity

LONG_AU_TENURE	Indicator variable taking a value of one if the company has engaged its auditor for 9 years or more, zero otherwise
LONG_CEO_TENURE	Indicator variable taking a value of one if the tenure of the CEO is in the fourth quartile (tenure > 6 years), zero otherwise
LOSS	Indicator variable taking a value of one if earnings before extraordinary items are less than 0, zero otherwise
LN_MARKETCAP	Natural logarithm of the firm's market value of equity
MERGER	Indicator variable taking a value of one if a merger takes place, zero otherwise
NEW_CEO	Indicator variable taking a value of one if a CEO change occurred during the year, zero otherwise
REL_IMPAIR	Ratio of the impaired goodwill divided by total assets
RESPONSIBLE	Indicator variable taking a value of one if the CEO is responsible for the impairment, zero otherwise. A CEO can be responsible by making the M&A decision (derived from 8-K and 10-K filings) and/or by mismanaging the acquired assets. CEOs with a tenure in the top ten percent of the sample (higher than eight years) are likely to have mismanaged the assets because of their long tenure. If goodwill is impaired after the CEO has managed the assets for such a long time, it is likely that the CEO caused the impairment by mismanaging the assets There are cases where it could not be determined if the currently sitting CEO or the predecessor made the M&A decision because, for example, only the segment to which the goodwill is allocated is mentioned in the 8-K or 10-K filings. In those cases, RESPONSIBLE takes a value of one when with certainty can be concluded that the CEO is responsible for twenty-five percent of the origination of the impaired goodwill. For example, the goodwill of the segment increases from fifty to one hundred under the CEO's leadership and then gets impaired for eighty. With certainty can be concluded that, even if all the goodwill of the previous CEO is impaired, the currently sitting CEO is responsible for at least 37.5 percent (30 / 80 = 0.375) of the impaired goodwill. In this case, RESPONSIBLE takes a value of one
RESTATEMENT	Indicator variable taking a value of one if the registrant reported a restatement or if a restatement will occur, zero otherwise
RESTRUCTURE	Indicator variable taking a value of one if the company reports restructuring expenses, zero otherwise
REV_CHANGE	Year-over-year percentage changes in revenue
ROA	Return on assets, defined as net income before extraordinary items divided by total assets
SHORT_AU_TENURE	Indicator variable taking a value of one if the company has engaged its auditor for 3 years Abror less, zero otherwise

SHORT_CEO_TENURE	Indicator variable taking a value of one if the tenure of the CEO is in the first quartile (tenure < 3 years), zero otherwise

Appendix B

Figure 4 Average marginal effects



Note: Figure 4 illustrates the average marginal effects of recording an impairment and/or being responsible on the likelihood of an auditor being dismissed.

Appendix C

Table 8 Auditor change likelihood analysis equation (1)

VARIABLES	(1) CHANGE	(2) CHANGE
IMPAIR	**0.385*** **	0.232
	(0.009)	(0.213)
RESPONSIBLE		**0.575*** **
		(0.003)
REV_CHANGE	0.001	0.001
	(0.494)	(0.526)
INVREC	0.214	0.207
	(0.588)	(0.601)
ROA	-0.804	-0.812
	(0.121)	(0.119)
LOSS	0.089	0.091
	(0.547)	(0.534)
CASH	-0.057	-0.044
	(0.897)	(0.921)
ALTMAN	0.114***	0.114***
	(0.007)	(0.007)
LEVERAGE	-0.076**	-0.075**
	(0.036)	(0.039)
GOING_CONCERN	1.236***	1.247***
	(0.001)	(0.001)
RESTATEMENT	1.232***	1.228***
	(0.000)	(0.000)
SHORT_AU_TENURE	0.177	0.192
	(0.149)	(0.119)
LONG_AU_TENURE	-0.100	-0.101
	(0.552)	(0.551)
BIG4	-0.269**	-0.263**
	(0.041)	(0.046)
LN_MARKETCAP	-0.220***	-0.221***
	(0.000)	(0.000)
MERGER	0.014	0.005
	(0.913)	(0.971)
RESTRUCTURE	-0.099	-0.101
	(0.372)	(0.364)
Constant	Included	Included
Industry fixed effects	Included	Included
Year fixed effects	Included	Included
Observations	20,230	20,230

Notes: This table presents the results of estimating equation (1), however, instead of DISAGREE, any change in the auditor is used as the dependent variable. Column (1) displays the estimations of the model without the interaction term and column (2) displays the model including the interaction term. Column (1) is included because

it can be used to indicate the effect of including the indicator variable RESPONSIBLE. The dependent variable is CHANGE. Bold text indicates the coefficients for the variables of interest. All variables are defined in Appendix A. Industry- and year-specific intercepts are not reported for brevity. Cluster (company) robust *z*-statistics are presented in parentheses below each coefficient. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).

Table 9 Auditor change likelihood analysis equation (2)

VARIABLES	(1) CHANGE
IMPAIR	-0.089
	(0.815)
RESPONSIBLE	0.467
	(0.293)
SHORT_CEO_TENURE	0.164
	(0.215)
IMPAIR * SHORT_CEO_TENURE	0.505
	(0.248)
RESPONSIBLE * SHORT_CEO_TENURE	**-0.127**
	(0.845)
LONG_CEO_TENURE	0.259*
	(0.056)
IMPAIR * LONG_CEO_TENURE	0.121
	(0.819)
RESPONSIBLE * LONG_CEO_TENURE	**0.299**
	(0.637)
REV_CHANGE	0.001
	(0.595)
INVREC	0.221
	(0.577)
ROA	-0.762
	(0.143)
LOSS	0.097
	(0.511)
CASH	-0.061
	(0.891)
ALTMAN	0.111***
	(0.008)
LEVERAGE	-0.076**
	(0.037)
GOING_CONCERN	1.219***
	(0.002)
RESTATEMENT	1.225***
	(0.000)
SHORT_AU_TENURE	0.165
	(0.185)
LONG_AU_TENURE	-0.144
	(0.394)
BIG4	-0.266**
	(0.044)
LN_MARKETCAP	-0.221***

	(0.000)
MERGER	0.011
	(0.930)
RESTRUCTURE	-0.110
	(0.324)
Constant	Included
Industry fixed effects	Included
Year fixed effects	Included
Observations	20,230

Notes: This table presents the results of estimating equation (2), however, instead of DISAGREE, any change in the auditor is used. The dependent variable is CHANGE. Bold text indicates the coefficient for the variable of interest. All variables are defined in Appendix A. Industry- and year-specific intercepts are not reported for brevity. Cluster (company) robust *z*-statistics are presented in parentheses below each coefficient. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).

9. References

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