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Goodwill Impairment and Earnings Management in the year of the pandemic

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Abstract

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Key words: Goodwill Impairment, Earnings Management, Discretion, IFRS 3, IAS 36, COVID-19

Purpose: The purpose of the research is to analyze managers' use of accounting discretion in goodwill impairment losses of European firms in 2020 – a year of financial distress caused by the COVID-19 pandemic – and whether the discretion employed reflects earnings management.

Methodology: The difference in earnings between impairers and non-impairers is analyzed by employing a Mann-Whitney U-test and an independent T-test. Consequently, a multivariate tobit regression is used to investigate the association between big bath earnings management and goodwill impairment in times of financial crisis (2020) compared to previous years. Finally, an OLS regression is applied to analyze discretionary impairment in 2020. The quantitative findings are complemented by flexible semi-structured interviews.

Theoretical perspectives: Previous literature on goodwill impairment regarding value relevance and managerial discretion, linked to signaling theory and agency theory respectively, are used to assist in explaining the effectiveness of impairment tests and why managers may engage in earnings management and discretionarily recognize goodwill impairments.

Empirical foundation: The empirical data consists of primary data from interviews with 7 European managers and secondary data from financial databases such as Bloomberg. 8,974 firm-year observations of European companies between 2010 and 2020 were analyzed.

Conclusion: Our findings suggest that the majority of companies that chose to impair in 2020 did not do so to take a big bath. However, negative pre-impairment earnings levels as opportunity to take a big bath seem to be a significant determinant of goodwill impairment, with stronger association in times of crisis. When analyzing discretionary goodwill impairment, we find that negative pre-impairment earning levels even tended to motivate an understatement of goodwill impairment compared to the economically induced value loss.

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1. Introduction

Even though the impairment-only approach has been adopted since the introduction of the new standards on goodwill accounting SFAS No. 142 and IFRS 3 in the early 2000s, the debate on whether the impairment test itself really does deliver the promised increased information content and better depiction of the underlying economics of the acquisition compared to the previous amortization approach as claimed by the standard setters (IFRS Foundation, 2020) remains questionable. In 2015, in its Post-Implementation Review of IFRS 3 based on comments received from preparers, auditors, academics and investors, the IASB acknowledged that there are several issues surrounding the impairment test such as complexity, the unfavorable high costs incurred in the valuation process, the fact that it requires significant managerial judgement and the tendency of management to recognize impairments in an untimely manner. Consequently, goodwill impairment was taken on as a research project on the standard setter's agenda. In a Discussion Paper in 2020 the IASB elaborated on stakeholders' concerns regarding the effectiveness of the impairment test and explored whether one can make it less costly and complex. The Board received numerous comment letters in response thematizing the managerial discretion in the process and calling for the consideration of the re-introduction of goodwill amortization. However, the Boards preliminary conclusion remains unchanged claiming that the impairment test is the "best way to hold a company's management to account for its acquisition decisions" (IFRS Foundation, 2020). In contrast, the FASB has undertaken significant efforts to simplify the heavily criticized impairment test as part of its technical agenda. In fact, at its meeting in December 2020 the Board explored goodwill amortization periods and methods for an impairment-with-amortization model (FASB, 2021). These contrasting courses of action from the standard setting bodies highlight the uncertainty and ambiguity surrounding goodwill impairment.

1.1. Background

Prior to the introduction of SFAS No. 142 in 2001, SFAS No. 121 dictated goodwill to be amortized over its estimated useful life but no longer than 40 years. Additionally, if indicators arose that pointed towards the possibility that the carrying amount of the goodwill could prove unrecoverable then an assessment of the recoverability of the carrying amount was required (Li & Sloan, 2017). The carrying amount is perceived as potentially unrecoverable when the estimated undiscounted future cash flows expected from the asset were lower than the carrying

amount. If that was the case the carrying amount was to be written down (Li & Sloan, 2017). The revised standards not only eliminated the amortization of goodwill but also introduced an annual impairment test. According to SFAS 141 and 142 goodwill is impairment tested at a reporting unit level in a two-step process. First, the fair value of the reporting unit as a whole is determined. If this estimated fair value lies above the carrying amount of the reporting unit then the second step needs to be performed. Here the fair value of all the assets and liabilities included in the reporting unit is estimated. The residual value of the fair value of the reporting unit is allocated to goodwill stipulating the implied fair value of that asset. If that fair value exceeds the carrying amount, then goodwill ought to be impaired to its fair value. Whereas the fair value is defined as "the amount at which that asset (or liability) could be bought (or incurred) or sold (or settled) in a current transaction between willing parties, that is, other than in a forced or liquidation sale" according to the FASB (FASB, 2001). If such a price is not determinable, then a present value estimation is mentioned as the best alternative, though multiple valuation is also permitted to some extent (FASB, 2001). As a response to stakeholders' criticism regarding the cost and complexity of the impairment test, the FASB has published Accounting Standards Updates No. 2011-08, Intangibles—Goodwill and Other (Topic 350): Testing Goodwill for Impairment, and No. 2017-04, Intangibles—Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. Thereafter, the first step of the aforementioned two-step impairment test was relaxed so that preparers could choose to carry out a qualitative evaluation in order to assess whether the carrying amount of the reporting unit is more likely than not to exceed its fair value. The outcome of this evaluation determines whether the preparers must conduct the two-step goodwill impairment test (FASB, 2011; Wen & Moehrle, 2016). Additionally, the Update in 2018 eliminated step 2 of the impairment test in the Board's effort to simplify the procedure even more. Hence, preparers no longer had to estimate the implied fair value of goodwill but only compared the reporting unit's fair value to its carrying amount in order to assess any impairment loss (FASB, 2018).

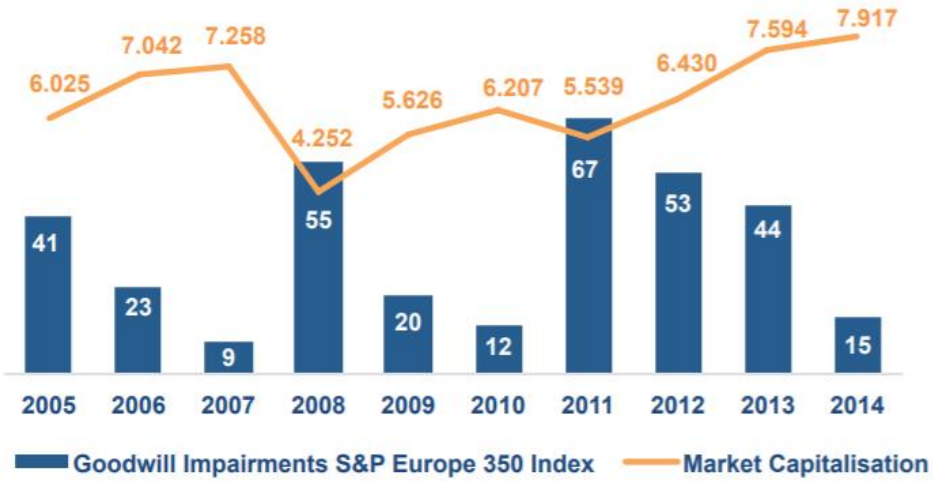
In 2004, as part of the convergence project between the IASB and FASB, IFRS 3 - *Business Combinations* in connection with the revised IAS 36 - *Impairment of Assets* introduced the new impairment-only goodwill accounting approach to IFRS adopting countries. Under IAS 36 companies are required to identify any goodwill impairment at least annually at the cash generating unit (CGU) level (IAS 36.9, IAS 36.66). An impairment is required when the carrying amount of the CGU exceeds the recoverable amount which is defined as the higher of

an asset's fair value less cost of disposal and its value in use (IAS 36.6). Due to difficulties obtaining market prices many companies opt for the estimation of the value in use which is the present value of future cash flows expected to be derived from the cash-generating unit. Any identified impairment loss is recognized as an expense first from the carrying amount of any goodwill allocated to the cash-generating unit and thereafter, impairment is allocated to the other assets of that unit (IAS 36.60, IAS 36.104).

When questioning why goodwill accounting was changed in the first place, we find multiple reasons in the accounting literature. Firstly, the revision of the respective standards aimed to provide a consistent and comparable accounting treatment of business combinations that represent the underlying economic substance and value development more appropriately than the previous amortization method (Seetharaman, Sreenivasan, Sudha & Yee, 2006; Donnelly & Keys 2002; Jong-Seo, C. & Ji-Ahn, N., 2020). The straight-line amortization of goodwill was often criticized for its "arbitrary assessment of useful life" (Wines, Daqwell & Windsdor, 2007, p.868) which required extensive managerial judgement. Wen and Moehrle (2016) also point out that the recoverability test under the previous SFAS 121 impairment test was flawed since it hardly ever led to the detection of any impairment losses. Ramanna (2008) finds that the introduction of the impairment-only approach in the US was a result of political pressure on the FASB exerted by lobbying firms that were discontent with the abolishment of the pooling method of goodwill accounting which resulted in mandatory amortization of goodwill and thus a yearly adverse effect on earnings. Other explanations for the shift to the impairment approach include that the amortization method was said to provide no information to investors about the performance of a firm's acquisitions (Ravlic, 2003). In his empirical research Clinch (1995) found no significant relationship between market reactions and goodwill amortization. Hence the impairment regime – so the argument goes – is thought to increase the value of information content conveyed in financial reports available to users of the financial statements (Colquitt & Wilson, 2002) and better support them in decision-making (Wines, Daqwell & Windsdor, 2007).

In its efforts to inform the debate on goodwill accounting the European Financial Reporting Advisory Group (EFRAG) conducted a quantitative study depicting the development of goodwill in Europe and other parts of the world. The study finds, among other results, that goodwill reported on the balance sheet of the S&P Europe 350 Index companies has increased by 43 % over the period from 2005 to 2014 (EFRAG, 2015). Further, it shows that goodwill

constitutes not only the biggest component of the companies' intangible assets with an average of 62% but that it also represents up to a noteworthy 19,5% of companies' total assets (excluding financial firms) (EFRAG, 2015). These statistics demonstrate that research surrounding goodwill accounting and the debate over such an increasingly important asset is highly relevant. Figure 1 depicts the evolution of goodwill impairment of these 350 blue-chip companies containing firms from 16 different countries in Europe. We note that reported impairments fluctuate to a great extent yet are highest in years when market capitalization suffered due to economic downturn such as 2008 or 2011. Interestingly, impairment losses remained significantly high even after market conditions had already recovered in 2012.



Notes: Numbers in billion euros.

Source: EFRAG (2015)

Figure 1: Evolution of goodwill impairments and market capitalization of S&P Europe 350 companies 2005-2014

A year of economic crisis, such as COVID-19 impacted 2020, which has had severe financial implications gives rise to the question to what extent European companies are affected and more specifically, whether the goodwill on their balance sheets has suffered an impairment loss. Due to the discretionary elements inherent in the estimation of the value in use, one would be curious whether any recognized impairment charges were economically induced or the result of managerial decision.

1.2. Problematization

Goodwill impairment has been associated with a wide spectrum of research in the past, exploring the implications of the impairment-only approach in various ways. The most controversial question based on previous studies seems to be whether the impairment test really is effective. The question of effectiveness not only relates to whether the impairment test actually accounts for the economic value development of goodwill but also whether it leads to the timely recognition of an impairment. When effectiveness is achieved, then the impairment test ought to provide useful information to the users of financial statements, whereas the IASB considers useful information as such that helps investors to "assess the performance of companies that have made acquisitions" and "more effectively hold a company's management to account for management's decisions to acquire those businesses" (IFRS Foundation, 2020).

The empirical findings in this field are fragmented. Several studies investigate the market reactions to impairment announcements (Bens, Heltzer & Segal 2011; Li, Shroff, Venkataraman, & Zhang, 2011; Hamberg, Paananen & Novak, 2011). The underlying premise of these studies is that if shareholders significantly react to such announcements, then the information conveyed by such an announcement must be value relevant to the investors' assessment of the company and, thus, the impairment test is considered to be somewhat effective. Bens, Heltzer and Segal (2011), for example, report a significant negative stock market reaction to discretionary induced goodwill, however, the reaction tends to be weakened when there is low information asymmetry in the first place or in cases when the impairment test presents itself to be particularly expensive.

Research on the determinants of impairment losses closely relate to the debate on discretionary incentives to impair. Multiple studies find support that the economic deterioration of a company's goodwill is associated with goodwill impairment but also find managerial incentives to be a decisive factor which makes the reliability of the financial information questionable (Jarva, 2009; Henning, Shaw & Stock, 2004; Hayn & Hughes, 2006; Romanna & Watts, 2012). Yet, studies investigating the discretionary elements inherent in the impairment test seem to reach contrasting conclusions. Beatty and Weber (2006) find that a company's leverage, CEO change, CEO bonuses as well as any market delisting concerns influence not only the impairment decision but also its timing. AbuGhazaleh, Al-Hares and Roberts (2011) find that goodwill impairments are associated with managerial agendas such as earnings management or

management changes but conclude that in the presence of effective disciplining devices discretionary judgement in the impairment test relates to management's private information about the company's value which they wish to convey to the investors rather than any opportunistic behavior confirming the IASB's objectives in the development of the standard. In contrast, Ramanna and Watts (2012) find support for the exploitation of the discretion inherent in the impairment test motivated by private incentives and reject the private information hypothesis. Li and Sloan hypothesized that goodwill under the impairment regime would only be written down "in the face of overwhelming evidence" (2017, p. 965).

The debate surrounding managerial incentives and goodwill impairment arises from the numerous assumptions required in the fair value estimation based on present value techniques and the allocation of goodwill to a cash generating unit. The value in use estimation, more particularly, the three main variables- the cash flow forecasts, the growth rate and the discount rate - all allow for great discretionary leeway (Avallone & Quagli, 2015). The resulting fair values are nearly impossible to verify by investors (Ramanna & Watts, 2012). The impairment test is conducted at unit level which involves the allocation of goodwill to these units when an acquisition is made and gives way for opportunistic behavior (Zhang, 2008; Wines, Daqwell & Windsdor, 2007). Watts (2003) describes this allocation process as unverifiable and arbitrary, especially in businesses with increasing number and size of units. This "shielding" of goodwill in the unit could generate unrecognized losses or gains, thus creating units with a high prospect of delaying or accelerating impairments respectively (Ramanna & Watts, 2012). There is no clear allocation key and managers could assign goodwill to multiple units as they see "reasonable and supportable" (SFAS 142.34). Also, the fact that the reversal of any goodwill impairment losses is prohibited (IAS 36.124; SFAS 142.15) may cause managers to be reluctant to recognize an impairment until the value deterioration is undeniable (Knauer & Wöhrmann, 2016).

According to agency theory managers will exploit the discretionary elements for their own benefit (Ramanna & Watts, 2012). Reputational incentives could motivate managers to impair goodwill on becoming a newly appointed CEO to "clean the slate" from their predecessor and escape accountability (Francis, Douglas & Linda, 1996; Jordan & Clark, 2015). Remuneration incentives based on reported earnings may also influence a manager's decision to avoid impairment (Ramanna & Watts, 2012). Other studies have found that managers pursue earnings management strategies in this context (Jordan & Clark, 2004). Kirschenheiter and Melumad

(2002) argue that earnings management is a natural strategy by management to improve earnings precision conveyed to investors. They describe an optimal disclosure policy where managers take a big bath when news is "sufficiently bad" (2002, p. 761) and smooth earnings when the news is good. Yet, most papers in this field perceive this behavior as undesirable manipulation or even threat to the integrity of financial reporting (Sevin & Schroeder, 2005).

Some studies in this context have suggested that the big bath strategy is especially exploited in times of economic crisis (Hayn 1995; Giner & Pardo 2015). When financial performance is plummeting due to economic circumstances management tends to take advantage of this depressed earnings situation. This way the economic circumstances are at fault for the impairment loss and attention is shifted away from the real reasons for poor performance. In the same vein, an economic crisis could justify the recognition of an impairment loss of an acquisition which has been underperforming for some time. The underlying rationale for this tactic is that investors react relatively the same to slightly underperforming companies compared to very poorly performing companies (Jordan & Clark, 2015).

Previous research on the controversial impairment-only approach seems to have focused on Anglo-Saxon countries and pre-dominantly investigated the SFAS No 142 setting in the US (AbuGhazaleh, Al-Hares & Roberts, 2011; Henning, Shaw & Stock, 2004; Wines, Daqwell & Windsdor, 2007; among many more). We find that studies on the application of IFRS 3/IAS 36 are underrepresented in the literature, even more so at a European level (Knauer & Wöhrmann, 2016; Gros & Koch, 2019; Hamberg, Paananen & Novak, 2011). Also, past studies on goodwill impairment and earnings management such as big bath have concentrated on this phenomenon in connection with CEO change (Jordan & Clark, 2015) or studied this topic in general (Elliott & Shaw, 1988; Kirschenheiter & Melumad, 2002; Sevin & Schroeder, 2005). To our knowledge only very few empirical studies investigated this relationship in a context of economic crisis in Europe.[1]

Investigating Europe's goodwill impairments in this context compared to American studies would be value adding due to the differences of the two continents. One difference concerns the predominant legal environment or enforcement regime. Knauer and Wöhrmann (2016), for

[1] Giner and Pardo (2015) study the determinants of the goodwill impairment decision of Spanish companies between 2005 and 2011 including effects of the financial crisis.

example, find differences in the market reaction to goodwill impairment based on the investor protection situation in countries which depends on the legal system (civil law versus common law). Hence, the divergence in legal regulations can influence the inference of goodwill impairment studies. Furthermore, the economic environment is slightly different, the 2019 GDP growth in the United States was 2,2% compared to only 1,6% in the European Union (Worldbank, 2021). The impact of COVID-19 on the two economies possibly also differs but the full consequences remain to be seen. Moreover, the US's net investment rate in nonfinancial assets has consistently exceeded that in the EU for the past ten years (Worldbank, 2021) possibly giving rise to higher goodwill recognition on American balance sheets. As stipulated in Section 1.1. the impairment test under SFAS 142 and IAS 36 is similar but not the same due to Updates by the FASB which affect the recognition of impairments. Furthermore, we argue that there may be differences in management styles regarding the pursuit of earnings management. US studies by Ibrahim, Xu and Rogers (2011) as well as Aubert and Grudnitski (2014) claim that there is a shift away from such behavior. It is worth exploring whether such a development can also be observed in Europe.

This paper aims to fill this gap and contribute to the current discussion on the effectiveness of the impairment-only approach by analyzing discretionary goodwill impairment in a year of significant economic downturn due to the outbreak of COVID-19. The research links the findings to contemporary challenges with goodwill accounting such as subjectivity, earnings management and agency-conflicts.

1.3. Research question & Purpose

The purpose of this paper is to analyze goodwill impairments in a time of financial crises. The current impairment test has been subject to criticism concerning the influence of managerial discretion. This study builds on the current literature by exploring discretionary induced goodwill impairment and linking it to managerial opportunistic behaviors such as earnings management, more specifically big bath earnings management.

The objective of our research is to investigate the following research question:

Is goodwill impairment in 2020 primarily a result of the economic impacts caused by COVID-19 or managerial discretion?

In our efforts to understand this relevant question we wish to dig a little deeper by adding more depth to our research with the following sub-questions:

- Have companies that chose to impair in 2020 already been performing poorly in previous years?
- How does big bath management as impairment determinant differ in crisis-ridden 2020 compared to previous more stable years?
- Why would management discretionarily choose to impair in times of crisis?

1.4. Contribution

In contrast to prior research, this study analyzes discretionary goodwill impairment losses in 2020 - a year of financial distress for many companies and industries. Moreover, there is little empirical evidence based on a European (IFRS) setting. Thus, this research contributes to filling this research gap by examining discretionary goodwill impairment and earnings management of European firms. The results offer standard-setters, enforcers, investors and other stakeholders findings of how the complexity and discretion in goodwill impairment tests are used in times of a financial crisis and to what extent management acts opportunistically to manage earnings. The research provides relevant information that could be useful in IASB's ongoing research project and discussion on the effectiveness of the impairment test, and the insights can potentially help standard-setters, auditors and other enforcers to identify certain drawbacks in the current accounting standards.

1.5. Outline of Thesis

The remainder of this research paper is structured in seven key chapters: Literature review, Hypothesis Development, Methodology, Data, Empirical Findings, Analysis and Discussion & Conclusion.

Chapter 2: The Literature Review gives a synthesized overview of previous research on goodwill impairment and elaborates on the two main literature strands identified in this field – value relevance and managerial discretion.

Chapter 3: Hypothesis Development discusses the main hypotheses we attempt to test in our effort to answer our research questions which are derived from the theories developed by past studies.

Chapter 4: Methodology elaborates on our research approach containing quantitative econometric techniques and qualitative elements and discusses the operationalization of our hypotheses and any limitations to our research.

Chapter 5: Data sheds light on our data collection method, sample size, conduct of interviews, variables included in our regression model and descriptive statistics.

Chapter 6: Empirical Findings presents our results derived from the interviews and quantitative research in light of our hypotheses.

Chapter 7: Analysis elaborates on our finding and related implications and also interpretates our insights in the theoretical context.

Chapter 8: Discussion & Conclusion discusses the main inferences that can be made based on the empirical evidence and concluding thoughts on our research. In addition, further work in this field and limitations of our research are described.

2. Literature Review

In the following section, an overview of empirical research on goodwill write-downs is outlined. Previous research on goodwill impairment seems to be split into two main strands 1.) *value relevance* and 2.) *managerial discretion* of goodwill impairments. These studies disagree on the fundamental question of effectiveness of the impairment test, however findings within the fields are also fragmented. An overview of the research techniques used in the following referenced literature can be found in Appendix 1.

2.1. Value relevance (signaling theory)

If goodwill impairments represent new information to investors about future cash flows, it would be expected that share prices decline upon the announcement. Alternatively, if managements delay impairments, share prices may drop ahead of announcements due to investors capturing impairment company value effects in advance, and announcements would then only have confirmatory value (Boennen & Glaum, 2014). Additionally, positive signaling effects may occur in cases where an impairment announcement signals that management acknowledges the goodwill deterioration and will act to improve future cash flows (Francis, Douglas & Linda, 1996; Hirschey & Richardson, 2002).

This phenomenon is examined in numerous information content and value relevance studies, which generally find negative correlation between stock returns and goodwill impairment reporting. Thus, these studies conclude that the impairment-only approach enables managers to convey new value relevant information to capital markets. For example, Francis, Douglas and Linda (1996) find that stock prices show significant negative effects to impairment announcements for US firms in the years 1989-92, indicating that announcements on average provide value relevant information and decrease investor expectations to a greater extent than any potential positive signaling effects. Similarly, Hirschey and Richardson (2002) find significant negative abnormal return for US companies in the years 1992-96 after goodwill impairment announcements. In the same vein, AbuGhazaleh, Al-Hares and Roberts (2011) find a significantly negative association between goodwill impairment charges and stock prices in a UK-based study under IAS 36. Xu, Anandarajan and Curatola (2011) find that goodwill impairment charges generally are viewed as new and value-relevant information, however, the signal is moderated by company profitability. For profitable firms, goodwill impairment

charges decrease investor expectations but for unprofitable firms the negative signals are muted. The results of these studies indicate that a goodwill impairment announcement is viewed as reliable indicator of economic performance and future cash flows and is incorporated in company valuations by investors.

Chen, Kohlbeck and Warfield (2008) find that the timeliness of goodwill impairment announcements improved after the adoption of SFAS 142. Moreover, Jarva (2009) finds evidence that goodwill impairment losses under SFAS 142 have a significant correlation to future operating cash flows, which is supported by Lee (2011), who finds evidence that goodwill impairment recognition has improved prediction of companies' future cash flow after the adoption of SFAS 142. Li, Shroff, Venkataraman and Zhang (2011) also report that goodwill impairment charges are negatively correlated with income and sales growth for the two following years after it has been reported. These findings generally indicate that the impairment test is associated with the underlying economic performance of an organization.

In this context, the results of Bens, Heltzer and Segal (2011) and Li et al. (2011) are noteworthy. The studies compare information content of goodwill impairment announcements prior to and after the adoption of SFAS 142. These studies analyze US companies for the years 1996-2006 and both studies find value relevance of goodwill impairment announcements but that there has been a significant weakening of negative stock impacts of goodwill announcements after the introduction of SFAS 142, suggesting that goodwill impairments have become less reliable after the adoption of SFAS 142. The authors speculate that the lower impact, however, may be attributable to smaller and more frequent goodwill impairments more common in the impairment-only era. Bens, Heltzer and Segal (2011) also find evidence that the information content of goodwill impairment announcements has declined for companies with low information asymmetry, using analyst followings as a proxy. Li and Sloan (2017) report similar evidence of impairments under SFAS 142 being less timely than under SFS 121. Moreover, their findings suggest that goodwill impairments lag deteriorating economic performance and stock returns by at least two years suggesting managers use discretion in their goodwill impairment by delaying its reporting. Analyzing impairment recordings under IAS 36 and SFAS 142, Knauer and Wöhrmann (2016) find a more negative market reaction to impairment announcement in civil-law countries which tend to have lower levels of investor protection compared to common-law countries.

2.2. Managerial discretion (agency theory)

Numerous studies also investigate whether managers strategically delay or accelerate write-offs to manage earnings (Hayn & Hughes, 2006; Zang, 2008; Ramanna & Watts, 2012; Li & Sloan, 2014). This is often discussed in the context of income smoothing and big bath earnings management. Income smoothing involves overstating goodwill impairment when pre-impairment earnings are exceptionally high to stabilize income over time. By recording an impairment loss, management may cause the earnings to be closer to the expected level (Riedl, 2004; AbuGhazaleh, Al-Hares& Roberts, 2011; Siggelkow & Zülch, 2013). Big bath accounting involves overstating impairment when pre-impairment earnings are exceptionally low in order to improve future earnings (Henning, Shaw & Stock, 2004).

There are conflicting findings and evidence on the use of income smoothing and big bath accounting when it comes to goodwill impairments. Managers have been shown to manipulate growth rates to manage earnings and convince auditors and analysts that there is no need for impairment (Avallone & Quagli, 2015). Zucca and Campbell (1992) find that asset impairments and write-downs are more likely to be reported in periods with unexpectedly low earnings, which is consistent with big bath earnings theory. A more recent study focused on European companies under IFRS by Van de Poel, Maijoor and Vanstraelen (2009) finds that firms impair goodwill more frequently when earnings are unusually low or high, indicating that managers use big bath accounting and income smoothing. AbuGhazaleh, Al-Hares and Roberts (2011) also find evidence that managers are exercising discretion in the reporting of goodwill impairments following the adoption of IFRS 3. Specifically, goodwill impairments are associated with income smoothing and big bath reporting behaviors. However, managers disciplined by effective governance mechanisms are less likely to act opportunistically but instead exercise their accounting discretion to convey their private information about future cash flows. Gros and Koch (2019) take an alternative approach by dividing goodwill impairment losses into economically induced and discretionary parts and analyze the determinants of discretionary parts instead of the fully reported goodwill amount. The results suggest that discretionary goodwill impairment losses are used opportunistically rather than informatively, but also that opportunistic behavior is constrained by strong corporate governance and enforcement mechanisms. Jordan and Clark's (2004) results suggest that Fortune 100 companies practice big bath earnings management upon the adoption of SFAS No.

142. Sevin and Schroeder (2005) find support for Jordan and Clark's (2004) findings of big bath earnings management in SFAS 142's year of adoption. Additionally, the study shows that small firms exercised big bath earnings management while large firms displayed no such signs. Francis, Douglas and Linda (1996) find contrasting results of income smoothing and big bath theories: write-offs are less likely for companies with unusually poor or good performance. This study, however, was made before the impairment-only approach and relates to all sorts of discretionary asset write-offs and is therefore not focused on goodwill impairments specifically.

Research has shown that agency motives lead managers to manipulate earnings through goodwill impairment discretion. Ramanna and Watts (2012) investigate the goodwill impairments and agency-based management incentives and find evidence that managers use the discretion inherent in goodwill impairment opportunistically instead of conveying private information. The findings are supported by Li and Sloan (2017) and Carlin and Finch (2010) who find evidence of opportunistic behavior such as delayed impairments and discount rate manipulation. Managers may exploit the discretion in goodwill accounting to manage earnings for their personal motives. This may be done to protect personal income and wealth (Darrough, Guler & Wang, 2014). There is evidence that suggests companies with cash bonuses tied to earnings report less goodwill write-offs (Beatty & Weber, 2006; Ramanna & Watts, 2012). Lapointe-Antunes, Courmier and Magnan (2008) find that organizations with managers that hold a high level of stock options are less likely to write off goodwill.

Another motive for earnings management discussed in studies on goodwill impairment is the potential effect of the impairments on managers' reputation. Several studies find negative association between goodwill impairment and CEO tenure (Francis, Douglas & Linda, 1996; Beatty & Weber 2006; Masters-Stout, Costigan & Lovata, 2008; Zang 2008; Hamberg, Paananen & Novak, 2011; Ramanna & Watts 2012) creating a clear motive for managers to delay impairments in order to avoid reputational damage. Goodwill of acquisitions made by previous CEOs has been shown to be more likely to be impaired by newly appointed CEOs who do not hold responsibility for the acquisition. A reason for this may be that new CEOs exercise big bath accounting to improve future financial performance without causing personal reputational damage. Moreover, financial results are generally irrelevant to managerial compensation during the first financial year of tenure. Formal compensation contracts usually come into operation at the start of the second year of tenure (Wells, 2002). Contrasting to these findings, Jordan and Clark (2015) find that goodwill impairments reported in the US no longer

seem to be recorded opportunistically by new CEOs. The opportunistic use of discretion to delay goodwill impairments may also involve more firm-wide motives and can stem from factors such as binding debt covenants or other debt related variables (Beatty & Weber, 2006; Ramanna & Watts, 2012; Riedl, 2004; Zang, 2008).

Studies on big bath management have found significant results when analyzing times of crisis. Giner and Pardo (2015), studied goodwill impairment losses of Spanish-listed companies between 2005 and 2011, a period that embraces the financial crisis. Their results suggest that managers are exercising significant discretion, using big bath and smoothing strategies to control goodwill impairment losses. The analysis suggests that the macroeconomic environment influences opportunistic and unethical behaviors. Although a different type of crisis, Cheng, Park, Pierce and Zhang (2019) find that companies experiencing a natural disaster are more likely to take a goodwill impairment loss. They find signs of opportunistic behaviors, with firms experiencing natural disasters being associated with increased year-over-year changes in ROA, higher buy-and-hold returns, and relatively higher executive compensation in the years following the natural disaster.

To summarize, it can be concluded that previous research has found strong evidence that goodwill impairment announcements under SFAS 142 and IFRS 3 provide value-relevant information to capital markets. However, there seem to be conflicting findings on whether SFAS 142 and IFRS 3 improved the reliability and timeliness of goodwill impairment reporting. Likewise, there is an intense debate in academia on the degree of opportunistic contra effective use of the inherent discretion in impairment-only rules. However, the majority of studies in this line of research find evidence that managers exploit the discretion inherent in the accounting rules opportunistically to some extent. The few studies on managerial discretion during crises suggest that the opportunistic side of the discretion is amplified in times of poor macroeconomic environments through big baths to improve future earnings. Our research adds upon the research by Giner & Pardo (2015) and Cheng et al. (2019) about the presence of big bath earnings management in times of crises and natural disasters by analyzing managerial discretions in the pandemic filled year of 2020. Moreover, the study focuses on goodwill impairments of European companies under IFRS, an area which has received less research attention compared to US firms.

3. Hypothesis Development

Inspired by previous studies on the managerial discretion inherent in the goodwill impairment test we would like to investigate the effect of earnings management in various ways. Hence, we formulate multiple hypotheses in order to answer our research questions and related sub-questions. As stipulated by previous research a big bath strategy is most likely pursued when the current year earnings are generally relatively low (Sevin & Schroeder, 2005) or "news is sufficiently bad" as described by Kirschenheiter and Melumad (2002, p. 761). In their comparison study of companies reporting goodwill impairment in 2002 to those that did not, Jordan and Clark (2004) argue that the future cash flow potential inherent in the value of goodwill does not deteriorate within one year and that an impairment is only warranted when a company has been subject to declining economic performance for a certain number of years, thus, any impairers that report similar earning levels to non-impairers in the years prior to the impairment but depressed earnings in the year of impairment must have carried out the write-down as an opportunistic attempt to "clear the decks" (2004, p. 63). Sevin and Schroeder confirm (2005) these findings in a similar study of large and small firms in 2002.

However, interestingly, in their research of more recent companies, Jordan and Clark (2015) find that the performance of impairers is, in fact, negatively associated with depressed earnings in the years prior to the impairment and is economically warranted rather than the result of any opportunistic discretion. These ambiguous findings lead us to investigate the performance of companies that recorded an impairment in 2020 compared to companies without any goodwill write-down. We formulate the following hypothesis:

H1: Relative to non-impairers, the performance of impairers was lower in the year of goodwill impairment and the previous years.

If rejected and earnings were only depressed in the year of impairment with no prior evidence of undesired performance development, the presence of big bath earnings management could be implied. It seems doubtful that one year of poor performance would cause the value in use and the inherent future cashflow predictions to be significantly affected and that year would arguably present itself to be a good time to "take the hit" (Jordan & Clark, 2004).

Alternatively, one could argue that COVID-19 is an extraordinary situation with uncertain economic implications for the years to come. As the value in use of goodwill or more

specifically, the CGU, is based on management's estimation of future cash flow the uncertainty regarding the future recovery of financial stability may actually warrant a goodwill impairment, especially in industries that were significantly negatively affected by COVID-19 measures. We believe the input derived from the semi-structured interviews will assist us in our inference of the quantitative findings to this hypothesis.

"Clearing the deck" seems to be even more the case in times of a general economic downturn or financial crisis which can be taken advantage of in order to recognize impairments discretionarily. Cheng et al. (2019) suggest that exogenous shocks such as hurricanes or other natural disasters for which the exact financial consequences are difficult for shareholders to verify create a possibility for management to reverse previous upward earnings management by taking a big bath so that desirable earnings levels can be re-established in the following years. Such circumstances are attractive since the market does not punish managers more for admitting poor performance when the economic environment in general is underperforming compared to market expectations (Jordan & Clark, 2015).

Sandell and Svensson (2017) have found that when disclosing reasons for the impairment losses the market is often used as an excuse to escape personal accountability. When performance does not live up to shareholders' expectations the cause is conveniently attributed to external factors which are not within management's control. An unexpected crisis such as COVID-19, for example, constitutes an event that could not possibly be anticipated by management which makes it a somewhat acceptable excuse (Sandell & Svensson, 2017). We, therefore, expect impairers in 2020 to have determined their goodwill impairment based on opportunistic earnings management motives, more so than in years prior to the negative economic impact. This discussion leads us to our second hypothesis:

H2: There is a stronger association between big bath earnings management and goodwill impairment in times of economic crisis compared to previous more stable years.

We wish to take this analysis of big bath earnings management even further by differentiating between expected goodwill impairment based on anticipated impairment due to economic factors and unexpected or "discretionary" goodwill impairment similar to approaches carried out by Li et al. (2011) and Gros and Koch (2019). This brings us to our third hypothesis:

H3: The pursuit of big bath earnings management is positively correlated with discretionary goodwill impairment in times of crisis.

4. Methodology

Based on the theoretical foundation established in previous research on goodwill impairment we intend to adopt a deductive approach. We aim to transform the above-stated hypotheses into an operational empirical form. While deductive research gives a clear direction of the research process, it also contains an inductive component (Bryman & Bell, 2017). When reflecting on our empirical results we will revisit academic literature and reflect on how our findings fit into the theoretical background.

According to Bhattacherjee (2012) deductive or so-called theory-testing research reaps greater insights when multiple contrasting theoretical strands surrounding the same research field are established. Regarding goodwill impairment, we have identified two main strands with multiple facets that present competing opinions on whether the exercise of discretion inherent in the goodwill impairment is either a signal of value relevance or private information conveyed by management about the future earnings potential of a company's acquisitions or a sign of opportunistic behavior such as earnings management. Since we aim to investigate goodwill impairment in the context of an existing theory i.e., big bath earnings management which we wish to verify in times of crisis we find a deductive approach most suitable.

In light of our research questions and the numeric nature of goodwill impairment we opt for a quantitative method in order to analyze the relationship between the numeric figures and opportunistic behavior. While quantitative findings help to identify any relationships between variables, we also wish to deepen our understanding of *why* companies engage in such behavior as part of our research and desire to supplement our insights with a qualitative technique. The technique applied should be geared to answering the respective research question(s). While the application of a mixed method approach has been subject to increasing popularity and acceptance (Bryman & Bell, 2017), it does hold some pitfalls. Based on the paradigm argument claiming that qualitative and quantitative research are separate paradigms Bryman and Bell (2017) recommend to fully integrate the two components with each other and interweave the findings as many researchers only connect the two superficially resulting in a fragmented research design.

We aim to pursue the facilitation approach of mixed methods research where we employ a qualitative research technique in order to support the quantitative research strategy. As the data

collected for our econometric analysis forms the basis for selecting our interviewees, these interviews ought to provide us with contextual insights on why managers pursue big bath earnings management, support for interpretation of the relationship between variables and some validity for the proxies used. To our knowledge, almost all academic studies on goodwill impairment carry out quantitative research of some sort. To facilitate comparison and validity of our contribution we wish to follow previous quantitative work yet aim to add more value by providing a "more rounded picture" (Bryman & Bell, 2017, p. 640).

4.1. Qualitative Research approach

In order to guide the quantitative analysis, we employ a qualitative research approach in the form of flexible semi-structured interviews with seven managers at different companies with hands-on experience of goodwill impairment tests under IAS 36. This qualitative approach proves to be a helpful starting point in our research approach as it facilitates the development of our quantitative model by gathering in-depth practical information from practitioners in the field.

Previous studies in the research field are overwhelmingly quantitative, and thus, we incorporate qualitative aspects to our research with the intention to increase the understanding of the link between goodwill impairment and managerial discretion and enhance the generality (Bryman & Bell, 2017) of our findings. Our interview questions were formulated in a manner to obtain detailed information to answer the sub-question as to *why* managers would discretionarily choose to impair goodwill in times of crises. The qualitative research provides contemporary insights from practitioners and adds a layer of context that facilitates interpretation of the quantitative findings. By adopting a mixed method approach we therefore overcome some limitations of the research in this field, which has predominantly relied on quantitative methods. For instance, the incorporation of qualitative data helps us challenge and verify many of the assumptions made in the research field.

4.2. Quantitative research approach

The quantitative techniques employed in previous related research are diverse. Appendix 1 depicts an overview of the research approaches chosen by past studies as well as variables included in the regressions employed. Past techniques involve tests of descriptive statistics,

tobit, probit, logistics, OLS regressions, event studies and many more variations. Appendix 1 was used as guidance for the development of our quantitative techniques and set-up of the regression models. In order to investigate our initial hypothesis concerning the earnings situation of impairment companies in 2020 and prior years relative to non-impairers we will employ a test of differences in the mean and median of financial performance similar to Jordan and Clark (2004).

The second hypothesis relates to the investigation of determinants, especially big bath earnings management of goodwill impairment. This relationship can best be analyzed using a tobit regression (AbuGhazaleh, Al-Hares & Roberts, 2011) incorporating a number of determinants such as accounting-based measures, market indicators, managerial discretion motives, corporate governance mechanisms, other firm characteristics and a macro-economic variable. A tobit regression is a suitable technique due to our dependent variable being left censored i.e., goodwill impairment has a lower limit of zero.

Finally, as part of our third hypothesis we aim to estimate the economically induced impairment by means of a OLS regression on the identified economic impairment factors and analyze the effect of the pursuit of big bath earnings management on the discretionary impairment in times of crisis, whereas times of crisis refers to the year of the pandemic crisis in 2020.

4.3. Econometric Method

Our research investigates not only the effect of the pursuit of a big bath earnings strategy on the impairment decision in 2020, but also the difference in determinants to previous years and discretionary determinants.

The method employed to test our initial hypothesis concerning potential big bath motives in the year of impairment by investigating the profitability of businesses prior to the impairment in 2020 relative to non-impairers is a statistical test of differences in the median of financial performance employing a Mann-Whitney U-test and an independent T-test for differences in means. The sample of companies will be separated into a group of firms that reported a goodwill impairment in 2020 (“impairers”) and those without any goodwill write-down (“non-impairers”) based on an impairment dummy variable. Thereafter, the median and mean financial performance in 2020 and the previous two years of these two groups will be compared for each year separately, similar to the approach conducted by Jordan and Clark (2004). As

measure of financial performance, we use two metrics commonly identified as "big bath indicators" in previous studies (Jordan & Clark, 2004; Sevin & Schroeder, 2005; Abuaddous, Hanefah & Laili, 2014; AbuGhazaleh, Al-Hares & Roberts, 2011): return on sales (ROS) and return on assets (ROA) whereas these refer to EBIT before goodwill impairment scaled by sales and total assets, respectively.

In our ambition to gain in-depth understanding of what determined a goodwill impairment in 2020 compared to previous more stable years and test our second hypothesis we run a multivariate tobit regression for our sample in 2020 and separately for the previous "more stable" 10 years (2010-2019) and aim to compare and discuss the estimated determinants. Following Lapointe-Antunes, Courmier and Magnan (2008), Beatty and Weber (2006) and Francis, Hanna and Vincent (1996) we employ a tobit regression to analyze the determinants of the goodwill impairment. As argued by AbuGhazaleh, Al-Hares and Roberts (2011) and validated by several researchers (Jong-Seo & Ji-Ahn, 2020, among others) a tobit regression model is best suited to investigate a dependent left censored variable such as goodwill impairment which has a lower limit of zero since goodwill impairment cannot be reversed.

We state the following baseline regression model:

$$\text{Goodwill Impairment}_{it} = \beta_0 + \beta_1 \text{ Big Bath}_{it} + \beta_2 (\text{Proxies for Managerial Discretion}_{it}) + \beta_3 (\text{Proxies for Corporate Governance}_{it}) + \beta_4 (\text{Economic Impairment Factors}_{it}) + \beta_5 (\text{Firm-specific Controls}_{it}) + \beta_6 \text{GDP} + \text{Year Controls} + \text{Industry Controls} + \mu \quad (1)$$

The dependent variable is goodwill impairment measured in multiple ways to ensure robustness of our results as discussed in Section 5.1.1, big bath earnings management is measured as an indicator variable for negative pre-impairment earnings as elaborated in Section 5.1.2., proxies for managerial discretion include leverage, earnings smoothing, CEO tenure and shares held by the CEO. Proxies for corporate governance consist of board independence of the audit committee, number of board meetings and percentage of women on the board. Economic impairment factors include the book-to-market ratio, change in sales, change in operating cash, and return on assets (see Section 5.1.3), firm-specific controls include the amount of goodwill and firm size. We further control for GDP to eliminate the effect of economic downturn on the

outcome variable as well as any industry effects. The change in GDP ought to control for any dynamics in the macroeconomic environment.

Thereafter, inspired by Li et al. (2011) and Gros and Koch (2019) we aim to predict the economically induced or "expected" goodwill impairment and wish to analyze the unexpected component as part of our overall research question and test our third hypothesis. In order to estimate the economically induced goodwill impairment we regress the economic impairment factors identified in model (1) on goodwill impairment using an ordinary least squares regression on our whole sample for the time period 2010-2020. Using the fitted values from that regression we predict the expected goodwill impairment. The difference between the estimated economically induced impairment and the reported impairment stipulates the unexpected component. It seems that the execution of an OLS regression is the most common econometric technique used in prior studies (Giner & Pardo, 2015; Avallone, & Quagli,2015; Ramanna & Watts, 2012) despite any concerns of bias due to the censored distribution of goodwill write-off (Maddala, 1991) and Madalla (1991) suggests that an OLS may be appropriate under certain circumstances. Thus, in order to understand the effect of different variables relating to opportunistic behavior on the unexpected impairment component of impairments in 2020 (time of economic crisis) we employ the following regression model:

$$\text{Discretionary Goodwill Impairment}_{it} = \beta_0 + \beta_1 \text{ Big Bath}_{it} + \beta_2 \text{ Smooth} + \beta_3 \text{ Leverage} + \beta_4 \text{ CEO Tenure} + \beta_5 \text{ CEO Shares} + \beta_6 \text{ Board Independence of Audit Committee} + \beta_7 \text{ Number of Board Meetings}_{it} + \beta_8 \text{ \%Women on Board} + \beta_9 (\text{Firm-specific Controls}_{it}) + \text{Year Controls} + \text{Industry controls} + \mu \quad (2)$$

The variables used to investigate the discretionary goodwill impairment are the same as subsumed in model (1) as proxies for managerial discretion and corporate governance. Previous studies on goodwill impairment have found either a positive impact or a mitigating effect of these variables on discretionary leeway when estimating goodwill impairment. We would find it an interesting endeavor to analyze these variables in the context of discretionary goodwill and not just the whole reported amount to see which factors dominate when economic impairment factors are taken aside. The proxies employed are elaborated in Section 5.

4.3.1. Diagnostic Tests

4.3.1.1. Multicollinearity

Multicollinearity is present when independent variables are perfectly correlated which results in omission of one of the variables and unreliable statistical results. In order to analyze the existence of potential multicollinearity between explanatory variables we examine the variance inflation factor.

4.3.1.2. Heteroskedasticity

We will conduct a White's tests and examine a histogram for the presence of heteroskedasticity in our regressions which indicates that the variance between the variables and the error term is not constant negatively affecting the reliability of the standard errors in the OLS regressions. The null hypothesis underlying the White's test predicts homoskedasticity, if rejected, heteroskedasticity is indicated and robust standard errors will be adopted in the OLS regressions to address the problem.

4.3.2. Limitations

Regarding possible shortcomings of our models, we would like to shed light on any concerns of omitted variable bias that arise from the limited data access and time constrains of this research. CEO compensation is commonly used in previous literature (Beatty & Weber, 2006; Darrough, Guler & Wang, 2014; Hamberg, Paananen & Novak, 2011) as a proxy for private incentives to carry out goodwill impairments discretionarily or rather avoid impairments (Ramanna & Watts, 2012). The omitted variable bias is determined by the effect of CEO bonus on goodwill impairment and the correlation of CEO bonus and our main explanatory variable - big bath earnings management. Based on previous findings by Beatty and Weber (2006), among others, we have reason to believe that CEO compensation negatively affects goodwill impairment. Certain performance-based bonuses tend to be dependent on reported earnings making unattractive any impairment which would reduce earnings thus indicating a negative relationship. Darrough, Guler and Wang (2014) find that the recognition of goodwill impairments results in a reduction in option based as well as cash-settled CEO bonuses and argue that this shall act as a deterrent for excessive risk-taking regarding acquisitions. Despite these findings they acknowledge that some compensation committees may correct CEO pay to

exclude extraordinary items such as goodwill impairment. Two interviewees confirm this notion and describe that they do not perceive CEO compensation to be a relevant factor in determining goodwill impairment because 1) goodwill impairment is corrected in calculating the basis for CEO bonuses and 2) the CEO is not even involved in the impairment test. Thus, whether CEO compensation really has a significant effect on goodwill impairment is questionable, nevertheless, any bias resulting from the omission of such a variable would also depend on the relationship between CEO bonus and big bath earnings management. In which direction CEO earnings-based bonus plans affect the pursuit of earnings management is unclear. Possibly, taking a big bath to "clear the decks" and lighten up future earnings levels is positively related to CEO bonuses, and so the omission of CEO compensation would indicate a negative bias.

Furthermore, our model may suffer precision due to unobservability of CGU-specific data. The performance for Cash Generating Units is not retrievable, thus, following previous studies such as Gros and Koch (2019); AbuGhazaleh, Al-Hares and Roberts (2011) we carried out the regression based on firm-wide impairment indicators.

The majority of the studies in this research field are based on US data, with a few additional UK, Australian and EU studies. One should be cautious in generalizing and applying findings from one institutional environment to another. There are, for example, indications of uneven application of IFRS between different countries because of differing accounting traditions (Kvaal & Nobes, 2012; Glaum, Schmidt, Street & Vogel, 2013) which may cause national differences in goodwill impairment accounting treatment, even for countries under the same accounting standards. These differences may limit the generalizability of our research. As shown in the literature review, research indicates that impairments are influenced by factors such as managerial incentive programs, debt covenants and corporate governance. However, managerial incentive schemes, capital markets and governance differ across countries (Conyon and Murphy, 2000), and thus managerial discretion and opportunistic behavior likely varies across national borders as well. National differences in corporate governance and enforcement mechanism also impacts the level of managerial discretion in goodwill accounting. High enforcement countries and companies with strong corporate governance are more likely to eventually impair goodwill (Verriest & Gaeremynck, 2009; Filip, Lobo & Paugam, 2021) indicating that the absence of corporate governance and enforcement increase managerial discretion and opportunistic behavior.

Lastly, we would like to address any issues of reverse causality. Reverse causality in our research would imply that goodwill impairments cause big bath earnings management instead of causality running from big bath earnings management to goodwill impairment. Theoretically, one could argue that the identification of an impairment could depress earnings to a negative level but since our BIGBATH variable is measured as pre-impairment earnings levels we do not observe any concerns of reverse causality.

Even though we find semi-structured interviews to be the most appropriate approach for our qualitative research, the technique has several limitations worth addressing. For example, the time to organize and conduct the interviews limits our ability to cover large samples, and thus, our smaller sample size of seven interviews may negatively affect the reliability of the findings. However, our sample of seven interviews is within the sample size recommended by Kuzel (1992) for semi-structured interviews of 5-25. There is also an issue of interviewer bias where the interviewer may steer the questions in a manner to support the hypotheses. We address this by formulating flexible and open-ended questions as well as conducting the interview in a manner that emphasizes how the interviewees understand the concepts and behaviors from their point of view and experience. We also found it challenging to find a good geographical spread of our interview participants. The majority of the interviewees work for Swedish companies. This is due to the fact that of the 100 interview requests, responses were far more positive for Swedish companies than foreign ones, resulting in an unanticipated uneven geographical spread of participants.

Since opportunistic behavior is primarily considered an unethical accounting practice, extracting transparent and reliable information about such behavior may be challenging in our qualitative interview approach. For example, interviewees may avoid disclosing information about opportunistic practices to protect the interest of the interviewee and the company. In order to address this limitation, we made a decision to keep the interview participants' names and companies' names confidential in order to encourage transparency and honesty and to respect their privacy.

5. Data

5.1. Data Collection & Sample

We use a combination of multiple databases as source of secondary data for our quantitative analysis. Accounting data was retrieved from Compustat and Bloomberg, market data and corporate governance variables from Bloomberg and GDP growth from OECD.

We selected all companies of the EUROSTOXX 800 extended by additional corporations listed at the Xetra Frankfurt, Euronext Amsterdam and NASDAQ Stockholm stock exchange reporting under IFRS with goodwill on their balance sheet at the beginning of 2020. Data was collected for the period between 2010 and 2020 resulting in 8,974 firm-year observations. We supplemented the EUROSTOXX firms with companies from these stock exchanges to obtain a larger more representative sample of European companies. We consider these to be significant stock exchanges in Europe and add some diversity to the EUROSTOXX as we include more bank-based countries such as Germany and market-based countries such as The Netherlands and Sweden as categorized by Bijlsma and Zwart (2013) in their analysis of factors of national financial structure. Following previous research, we exclude financial firms or any companies with majority public ownership. Companies are classified based on the first two digits of the Global Industry Classification Standard (GICS Code) stipulating 10 key industry segments (excluding financial).

We collected primary data by conducting semi-structured interviews with company representatives with experience of goodwill impairment tests under IAS 36. The interview questions were formulated to target our research question, and to particularly emphasize the *why* sub-question of our research. The questions therefore cover aspects such as impairment testing procedures, managerial discretion and situational impacts of macro-economic environments on earnings management. See Appendix 2 on the interview questions.

100 companies from our sample (EUROSTOXX 800, Xetra Frankfurt, Euronext Amsterdam and NASDAQ Stockholm stock exchange) were randomly selected and contacted via their investor relations email addresses obtained from their respective company webpages. The interview invitation stated the topic and purpose of the interview and study at large to ensure potential interviewees were familiar with the topic and interested in providing insights to the

study. Out of the 100 interview requests, seven positive responses were received. Upon accepting the interview invitation, interviewees were further briefed on the topic via email including an interview overview document outlining the interview questions.

The interviews were conducted and recorded via Zoom. Since managerial discretion involves opportunistic behavior such as big bath and income smoothing, the decision was made to keep the company names and representatives of the interviews anonymous. This decision was made to respect the privacy of those who participate (Bryman & Bell, 2017) and also to encourage participants to speak freely and transparently.

5.1.1. Dependent Variable

GIMP: We employ two measures of goodwill impairment in our tobit regression model to ensure robustness of our results. The most often used measure in similar studies is goodwill impairment scaled by total assets whereas some researchers use total assets at the beginning of the financial year (Li & Sloan, 2017; Choi & Nam, 2020; Ramanna & Watts, 2012) and some at the end of the period (AbuGhazaleh, Al-Hares & Roberts, 2011; Francis, Hanna & Vincent, 1996; Riedl, 2004; Lapointe-Antunes, Courmier and Magnan, 2008 and Zang, 2008). We will be using both metrics, yet goodwill scaled by total assets at year-end will be our main dependent variable of reference for testing our OLS regression to limit the complexity of this study.

5.1.2. Explanatory Variable

BIGBATH: As our main explanatory variable, we are interested in how big bath earnings management affects the recognition of goodwill impairment. As management philosophies are not observable, we turn to proxies for big bath earnings management used in similar research.

A big bath is often undertaken *via* goodwill impairment. Previous research, for example, has measured big bath earnings management by the magnitude of extra-ordinary charges (Cheng et al., 2019; Elliott & Shaw, 1988). We argue that this measures the execution of a big bath strategy *per se* i.e., *taking* the big bath. To address any issues of reverse causality we consider our big bath variable to measure the *opportunity* to take a big bath which may result in the recognition of an impairment. As described by Zucca and Campbell the "big bath" is perceived "as a probable motivation for recording asset write downs" (1992, p. 35).

The opportunity to take a big bath is characterized by an already depressed earnings situation prior to the impairment, thus, we adopt an indicator variable equal to one when pre-impairment earnings are negative (Jordan & Clark, 2004; Masters-Stout, Costigan & Lovata, 2008; Giner & Pardo, 2015). Based on the theoretical background surrounding big bath earnings management elaborated earlier we anticipate a positive relationship between our big bath variables and goodwill impairment.

5.1.3. Control Variables

5.1.3.1. Economic impairment factors

BTM: The most common impairment indicator mentioned in literature on goodwill impairment is the book-to-market ratio of equity (Beatty & Weber, 2006; Francis et al. 1996; Giner & Pardo, 2015). We use a standard book-to-market measure defined as the book value of equity divided by its market value. We predict a positive association with our dependent variable (Kabir & Rahmen, 2016).

ΔSALES: Another economic impairment factor used by Hayn & Hughes (2005), among other researchers (AbuGhazaleh, Al-Hares & Roberts, 2011; Riedl, 2004), in their impairment prediction model, is the percentage change or growth of sales from t-1 to t.

ΔOCF: The percentage change in operating cashflow from t-1 to t is also used as an economic performance indicator (Choi & Nam, 2020; Kabir & Rahmen, 2016).

ROA: Return on assets measured as EBIT divided by total assets at the end of the year is one of the most common used variables in quantitative research on goodwill impairment. Li and Sloan claim this accounting measure "speaks to the fair value of the underlying assets" (2017, p. 975).

A declining ΔSALES, ΔOCF and ROA could be indications for reduced future outlooks and possibly, a goodwill impairment, hence, we predict a negative relationship between these variables and our dependent variable.

In line with previous research, we scale all our economic impairment factors (except BTM) by total assets at the end of the year to reduce issues arising from endogeneity and standardize

measures in light of differing reporting currencies (Zhang, 2008; Lapointe-Antunes; Cormier & Magnan, 2008).

5.1.3.2. Proxies for Managerial Discretion

SMOOTH: According to Kirschenheiter and Melumad (2002) there exists an equilibrium of optimal earnings management. They claim that in times of desirable performance management will report higher net income but will tend to smooth earnings to avoid excessive high earnings that could impact the perceived precision of reported earnings by investors and potentially make investors adjust their expectations to unrealistic high levels. In order to control for the effect of such earnings smoothing on goodwill impairment we employ the variables SMOOTH and predict a positive effect on impairment. Admittedly, a significant effect of smoothing in our regressions on impairment in 2020 will probably be the exception. Companies reporting extraordinarily high earnings so to that they may be incentivized to smooth earnings by undertaking a goodwill impairment in a time of economic downturn are most likely very limited. We measure earnings smoothing as an indicator variable equal to one if the absolute change in pre-impairment earnings from the prior year scaled by total assets is above the industry median of the pre-impairment earnings change (Choi & Nam, 2020; AbuGhazaleh, Al-Hares & Roberts, 2011).

LEVERAGE: Leverage and related debt-covenants are said to influence management's decision to impair because a significant reduction in earnings could result in the violation of covenants which is costly (Beatty & Weber, 2006; Zhang, 2008; Riedl, 2004). Alternatively, a company's assets may be subject to scrutiny exercised by borrowers which restricts any opportunistic behavior (Giner & Pardo, 2011; AbuGhazaleh, Al-Hares & Roberts, 2011). Riedl (2004), for example, finds a significant negative association between leverage and goodwill impairment. As data on debt-covenants are not retrievable we turn to leverage as commonly used proxy (Avallone & Quagli, 2015; Chalmers, Godfrey & Webster, 2011). Arguably, debt covenants will only have a significant influence on impairment decisions in highly leveraged companies (Godfrey & Koh, 2009). Leverage is measured as the ratio between total debt to total assets by the end of the year. Due to ambiguous opinions on how leverage impacts impairment, we do not specify the direction of the relationship.

CEO TENURE: Numerous research papers related to goodwill impairment have focused on the relationship between new CEOs and impairment. The underlying premise is that a CEO who

has not undertaken the respective acquisition is more likely to recognize write-offs since poor performance of previous acquisitions can be attributed to former management (Elliott & Shaw, 1988; Francis, Vincent & Hanna, 1996; Lapointe-Antunes, Cormier & Magnan, 2008). Beatty and Weber (2006) argue that CEOs with a shorter tenure have less incentives to avoid impairment charges compared to the CEO who has made the acquisition decision in the first place. They find a significant effect of CEO tenure on the decision to impair as well as the magnitude of goodwill impairment. We employ CEO tenure as the number of years a CEO has been in office at fiscal year-end to control for the increased likelihood for impairments for new CEOs. A negative relationship is predicted.

CEO SHARE: Concerning CEO ownership, agency theory predicts that giving executives shares will align their interests with those of shareholders and mitigate any opportunistic behavior (Jensen & Meckling, 1976). AbuGhazaleh, Al-Hares and Roberts (2011) find that executive ownership as proxy for corporate governance is positively related to goodwill impairment. However, Interviewee 2 names the fear for the negative market reaction as one of the main reasons for managers to avoid impairments discretionarily. We believe that this may be even more so when management themselves own shares. Thus, we expect that the sign for the CEO SHARE coefficient could be negative or positive. This variable is measured as the percentage of common shares outstanding held by the CEO at fiscal year-end.

5.1.3.3. Proxies for Corporate Governance

A strand of literature has investigated the role of measures of corporate governance on opportunistic behavior. Kabir and Rahmen (2016) find that effective corporate governance mechanisms restrict discretionary goodwill impairment and strengthen the relationship between goodwill impairment and economic impairment factors, however, such mechanisms cannot fully eliminate opportunistic use of discretion. We incorporate corporate governance mechanisms as variables to control for their effect on goodwill impairment, however, their detailed interpretation and significance are not the focus of this study.

BOARDIDP_AUD: The independence of board members is commonly described as a crucial mechanism for strong corporate governance (Lapointe-Antunes, Cormier & Magnan, 2008; Gros & Koch, 2019). Klein (2002), for example, finds that firms with more independent members of the audit committee have lower abnormal accruals which is said to be a financial line item subject to managerial discretion. We employ board independence as percentage of

independent board directors of the audit committee to capture this constrain of management's accounting discretion on determining goodwill impairment.

%WOMEN: Inspired by the growing strand of research on board diversity and female representation on supervisory boards we employ the percentage of women on a company's board as an additional measure for corporate governance. Adams and Ferreira (2009) suggest that more gender-balanced boards dedicate higher effort to monitoring in terms of meeting attendance and committee memberships. Post and Byron (2015) confirm a positive relationship between monitoring effectiveness and women on the supervisory board. Hillman, Canella and Harris (2002) emphasize the vast experience, diverse educational background and network that female representation can bring to the board.

#BMEETINGS: Xie, Davidson and DaDalt (2003) have found a positive association of frequent board meetings and increased financial reporting quality. We argue that a high number of board meetings indicate that the board is exercising increased monitoring tasks which could decrease the opportunity for managers to exploit discretion in accounting rules. This variable is measured as the number of supervisory board meetings in a respective financial year.

These proxies for Corporate Governance may have a negative effect on goodwill impairment where the above-mentioned mechanisms restrict any discretionary impairments which are motivated by smoothing or big bath motives or they could have a positive effect where they promote an impairment if economically warranted and discipline management in their attempts to avoid such an undesirable charge. Hence, the effect could be positive or negative.

5.1.3.4. Firm-specific Controls

FIRMSIZE: Consistent with prior research we control for firm size measured as natural logarithm of total assets. Firm size may be related to several factors: quality of financial reporting, managerial know-how, audit mandate, cost and complexity of the impairment test (Chalmers, Godfrey & Webster, 2011) or simply the "ability to follow the provisions established in IFRS 3" (Giner & Pardo, 2015, p. 30).

GOODWILL: Similar to Masters-Stout, Costigan & Lovata we use pre-impairment goodwill scaled by total assets as additional control.

5.1.3.5. Other controls

GDP: We control for effects of the economic recession induced by the impact of the pandemic by employing a macroeconomic measure such as national GDP growth. As COVID-measures or, more specifically, lockdown measures to stop the spread were taken on a national level, countries' economies were affected to different extents by the consequences of COVID-19, therefore, we believe a national measure to be a more suitable control for macroeconomic dynamics than the Europe-wide GDP growth. The GDP variable is measured as the percentage change in GDP compared to the previous year.

INDUSTRY: Similarly, we include industry dummy controls in our regression model to account for the fact that some industries may have suffered more financially due to restrictions whereas other industries such as health care, for example, have prospered in the times of pandemic.

YEAR: Year Dummies control for any other effects that occurred in a certain year and may somehow affect goodwill impairment.

5.2. Descriptive Statistics

Table 1 shows the construction of our sample by industry. Our sample is based on the EUROSTOXX 800 supplemented by companies listed at the Xetra Frankfurt, Euronext Amsterdam and NASDAQ Stockholm stock exchange excluding firms without goodwill in 2020 resulting in 8,974 firm-year observations. Missing data on some variables results in an unbalanced panel data structure. As depicted in Table 1 our sample primarily consists of industrial companies followed by companies in the Consumer Discretionary and Information Technology industry. The most underrepresented industry in our sample is Real Estate with only 11 firm-year observations. Possibly most real estate companies do not recognize any goodwill upon acquisition since their target's assets mainly consist of real estate properties rather than any intangible assets that would give rise to any additional transferred consideration i.e., goodwill. This would explain why our sample which excluded companies without goodwill in 2020 is short of representation of Real Estate businesses. Table 1 also makes clear that goodwill impairments occur infrequently. Among our 8,974 firm-year observations only 1,339 impairments were conducted, this equals approximately 15% of all observations. A similar

trend can be observed when only looking at our observations in 2020. 19% out of 771 observations in 2020 recognized a goodwill impairment.

Table 1: Sample Construction

	Firm-year observations
Communication Services	709
Consumer Discretionary	1392
Consumer Staples	733
Energy	303
Health Car	944
Industrials	2616
Information Technology	1062
Materials	813
Real Estate	11
Utilities	391
Final Sample	8974
Goodwill impairments	1339 (15% of total sample)
Observations belonging to 2020	144 (~19% of 2020 sample)
Non goodwill impairments	7635 (85% of total sample)
Observations belonging to 2020	627 (~81% of 2020 sample)

Table 2 presents descriptive statistics of all variables of our firm-year observations in the sample period of 2010–2020 used in the regression models. With the majority of our observations being non-impairments a median of zero of our goodwill impairment variables comes as no surprise. This causes our data on the dependent variables to be slightly right skewed. Also, most companies in our sample do not report negative pre-impairment earnings as indicated by the zero median of our BIGBATH variable. Our BTM variable displays some extreme values. Negative BTM are of little informative value since negative equity affects the inference. There are some companies with extremely low market capitalization driving the maximum BTM in our sample. Further, some companies have experienced a shockingly negative sales and operating cash flow development as can be seen when observing the minimum values of ΔSALES and ΔOCF. These outliers negatively affect the mean. Most of the CEOs in our sample serve 4,5 years with some very short exceptions, possibly only transitional appointments and some very long serving CEOs with a maximum of 42.08 years. Other interesting findings include that the mean as well as the median of BOARDIDP_AUD indicate that in fact around 50% of the members of the audit committee of our observations are non-executives. i.e.,

independent. Noteworthy is also the maximum number of board meetings in our sample. We find multiple firm-year observations that report between 51 and 87 board meetings in one financial year. Interestingly, all these companies are Russian organizations. Extraordinary outliers have been cross-checked with respective annual reports to ensure validity of the data.

Table 2: Descriptive Statistics

Continuous Variables	mean	median	sd	min	max	N
GIMPTA	.0025757	0	.0343359	0	2.862112	8974
$GIMPTA_{t-1}$	.0023818	0	.0270159	0	2.138153	8974
Economic Impairment Factors						
BTM	.8800835	.4244932	7.706953	-34.45046	402.2504	8220
ΔSALES	.0226922	.0351714	1.203532	-102.555	1.990593	8140
ΔOCF	-.2872198	.0080493	34.91828	-3148.25	622	8541
ROA	.0857409	.0772326	.1193934	-.9733286	3.116751	8962
Proxies for Managerial Discretion						
LEVERAGE	.1875439	.1677753	.1592946	0	2.666667	8973
CEOTENURE	6.271288	4.58	5.942078	.08	42.08	4195
CEOSHARE	.5768446	0	6.198866	0	100	8974
Proxies for Corporate Governance						
BOARDIDP_AUD	47.5001	50	45.05981	0	100	8940
#BOARDMEETINGS	9.209196	8	5.024242	1	87	5894
%WOMEN	15.82875	14.286	15.90067	0	88.888	8953
Control Variables						
FIRMSIZE	8.093065	8.162815	2.159622	.1160037	16.9662	8974
GOODWILL	.1873869	.1467818	.1615928	.0000303	.9254658	8974

Notes: absolute values are in millions. GIMPTA: goodwill impairment scaled by total assets at the end of the year; $GIMPTA_{t-1}$: goodwill impairment scaled by total assets at the beginning of the year; BTM: book value divided by market value of equity; ΔSALES: absolute change in sales from prior year scaled by total assets; ΔOCF: absolute change in operating cash flow from prior year scaled by total assets; ROA: Pre-impairment EBIT scaled by total assets; LEVERAGE: Total Debt divided by Total Assets; CEOTENURE: number of years a CEO has been in office; CEOSHARE: percentage of outstanding common shares held by CEO; BOARDIDP_AUD: percentage of audit committee members that are not part of the executive/management board; #BOARDMEETINGS: number of meetings of the supervisory board; %WOMEN: percentage of women on total board; FIRMSIZE: natural logarithm of total assets; GOODWILL: pre-impairment goodwill scaled by total assets

Table 2 (Continued)

Dichotomous Variables	mean	p50	sd	min	max	N
BIG BATH	.1035483	0	.3046907	0	1	8962
SMOOTH	.4570983	0	.4981838	0	1	8974

Notes: BIGBATH: dummy variable equal to 1 if pre-impairment earnings are negative; SMOOTH: dummy variable equal to 1 if change in pre-impairment earnings is above industry median

Finally, we wish to gain an overview of the recognized goodwill impairments in 2020 specifically. When examining Table 3 we find that out of the 144 reported impairments mostly industrial companies carried out a write-down. However, as elaborated earlier Industrials is the most strongly represented industry in our sample. Consumer Discretionary, Communication Services and Consumer Staples follow Industrials when it comes to the number of observations reporting an impairment. It is worth mentioning, however, that Consumer Discretionary companies recognized higher impairments in magnitude in relation to total assets than all the other industries.

Table 3: Goodwill impairments scaled by total assets in 2020 by GIC industry.

Industry	Mean	Median	min	max	N
Communication Services	.0175299	.0049405	.0000194	.0780024	17
Consumer Discretionary	.1368694	.0087549	.0004056	2.862112	24
Consumer Staples	.0097871	.0017526	.0000514	.0418411	14
Energy	.0449908	.0024561	.0001616	.2149288	8
Health Care	.0046681	.0029259	.0000221	.0191207	9
Industrials	.0118748	.0045997	.000041	.1123126	41
Information Technology	.0070745	.0030834	.0004243	.0321091	11
Materials	.019167	.006442	.0006313	.0833052	11
Real Estate	.0005466	.0005466	.0005466	.0005466	1
Utilities	.0037721	.0013111	7.27e-06	.014003	8
Total	.0342228	.0041797	7.27e-06	2.862112	144

6. Empirical Findings

6.1. Qualitative Findings

6.1.1. Interview Findings

Appendix 3 gives an overview of the interviews conducted listed by country of incorporation of the company interviewed, job position of the person we interviewed and the involvement in the impairment test in order to validate that the interviewee possesses relevant know-how and can contribute reasonably to our questions. The interviews are indexed with an ID number since the names of the companies and persons we interviewed are anonymized. In the following section the key insights on the execution of the impairment test in practice, the exploitation of discretion inherent in the impairment test related to the ability to manage earnings and any impacts caused by COVID-19 on the estimations gained from the interviews are summarized.

Interview 1

Interviewee 1 confirms that he would have the ability to manage earnings by taking goodwill impairments discretionarily. However, he mentions that the basis for the estimation of future cash flows is the prospective budget for the CGUs which is signed off by the board and simply "handed to him", thus, he does not have any influence on the budget which is the cornerstone of the forecast. Yet, he could "tweak" the assumptions on growth rates. However, these assumptions are scrutinized by auditors and generally questioned "a lot". After "convincing the auditors", the audit committee also has to sign off the impairment test.

Regarding the impact of the pandemic on the company's impairment test Interviewee 1 says that since the impairment test is solely based on the future and they assume a greater demand for their products in years to come based on the future trend of more people working from home, COVID-19 had a limited effect on their estimation of the value in use. The WACC was adjusted upwards due to the different outlooks in the different markets they operate in, resulting in a little less headroom before an impairment is warranted.

There is a high likelihood according to Interviewee 1 that some companies use the pandemic crisis to "clean up their balance sheets" and improve earnings levels going forward by undertaking overly pessimistic assumptions in their calculations. It is an opportunity to "get

rid" of assets which were at the limit of being written down anyway. As motives for such a move he mentions that the focus from the external market would be shifted towards the negative financial effects caused by COVID which are out of management's control e.g., the closure of factories. The picture is "blurred" for investors and management is held less accountable for any undesirable performance. He does not see any CEO remuneration incentives to impair discretionarily and also, the CEO is not involved in the impairment test.

Interview 2

Interviewee 2 describes the execution of their impairment test in detail. The forecast for the first three years is based on a detailed budget for each CGU drafted by group management. For year 4 and 5 they simply use a 2% growth assumption for sales and cost. They create a full balance sheet forecast for all five years. The two percent growth assumption for the last two years of the explicit forecast are very cautiously chosen. The past years have shown an average growth rate of around 17%, even in 2020 they reported 10% growth. Furthermore, they do an extensive sensitivity analysis with a zero-growth assumption and an increase of the discount rate of up to 3% to analyze headroom of goodwill. The CFO together with the CEO decide on the allocation of goodwill upon acquisition. As indicators for an impairment Interviewee 2 mentions significant underperformance of a CGU based on key metrics such as profit, sales and net working capital. Return on assets and the book-to-market ratio are also indicators included in their estimation model. The pandemic has influenced the parameters of the company quite significantly. The WACC used in the value in use calculation was increased by 1,5% and the growth assumption for 2022 and 2023 decreased by 5% which has reduced the goodwill headroom quite significantly but is still quite large according to Interviewee 2.

When asked about the ability to manage earnings via goodwill impairment Interviewee 2 strongly agreed and referred to previous employments as CFO in other companies. One of them had almost no headroom related to the recoverable amount of goodwill and the management team was advised by the chairman of the audit committee on how to minimize WACC so that an impairment could be avoided and how to get these assumptions approved by the auditors. From his experience assumptions tend to be more optimistic the further the forecast goes into the future. While auditors do question the assumptions Interviewee 2 emphasizes that it is difficult for auditors to verify management's assumptions and will most likely only oppose the

estimations made when there is a significant increase in sales or profitability forecasts compared to the prior year's valuation.

As motives to impair or rather not to impair Interviewee 2 mentions the negative market reaction to goodwill impairments as a main factor. Often CEOs are compensated based on the stock price or the development of a project which contributes to the adverse attitude to impairments. However, if one does identify an impairment, it is attractive to recognize it in times of general economic downturn such as COVID-19 or the financial crisis over ten years ago because managers can use these macroeconomic changes as scapegoats to conduct some extra write-down of goodwill, inventory or other assets. "Also, it's easier to do it because the performance has already gone bad.", says Interviewee 2. Lastly, he mentions that every now and then investors have questions related to impairments but not very often.

Interview 3

When asked about indications for impairment at his company Interviewee 3 says that a significant market downturn in a specific country or the loss of a significant customer would be such an indication rather than financial metrics during the year. The estimation of future cash flows is based on the forecast from the local entities which are collected three times a year including a forecasted balance sheet and a long-range plan. For the impairment test they simply consolidate these forecasts on group level into their Discounted Cashflow spreadsheet model. In that sense, the estimations are bottom up according to Interviewee 3 and discussed with the local CFOs of the operating segment, hence he does not really have any impact on those numbers.

The CGUs are defined as the individual countries resulting in around 20 CGUs. Upon acquisition goodwill is attributed to the group company that is undertaking the acquisition at the lowest level i.e., attributed to that country CGU. So, the allocation process is "quite clear" and "straight forward". In 2020 a goodwill impairment was identified; however, it was due to the loss of a very large customer contract which immensely impacted cash flow projections and unrelated to any impacts caused by the pandemic.

Interviewee 3 confirms that he would have the ability to manage earnings in his position but says "it's not that simple". Calculations need to be supported by information as auditors look at this quite thoroughly and the assumptions have to be defended in front of the audit committee

which has to approve the calculations. Also, there are some checks of balances that can be done to check if the value in use is somewhat realistic by comparing it to the market capitalization of the company.

Regarding incentives to manage earnings Interviewee 3 does not confirm any such incentives arising from programs based on earnings per share even though share price would "take a hit" since impairments "do not look good", he believes that this would be adjusted for in the "follow-up". Instead, he finds the real incentive for an impairment to be the improvement of "visible" key ratios such as Return on Equity and Return on Capital Employed for the years following the impairment.

As concluding remarks Interviewee 3 mentions that he would prefer the return to the amortization regime, not only because the process is somewhat costly but because of the extraordinary workload. Also, he says that many analysists would disregard goodwill and impairment effects just as they disregard amortization in their analyses of company values so if goodwill is really just "a residual somewhat fictive item" - why not just undertake amortization and make everyone's lives easier?

Interview 4

As an investment company that has acquired and operates more than 200 subsidiaries, the interviewee describes that it is unsustainable to test these companies independently. Instead, the company has apportioned goodwill to eight cash-generating units, which for the company is equated with its eight operating segments. These operating segments contain a large number of companies and the interviewee states that this procedure is industry standard, and peers do it in a similar manner. Newly acquired businesses with goodwill balances and contingent earn-outs are tested separately.

In addition to an annual impairment test, interviewee 4 describes that additional impairment reviews may be triggered in cases when it becomes apparent that actual financial results of cash generating units significantly underperform the cash flow forecasts used in the previous impairment tests. In reference to the goodwill impairment loss the company took in 2020 for one CGU, interviewee 4 explains that the financial results for the corresponding operating segment had been underperforming for several years, especially due to poor performance of a few entities in the segment. The interviewee also states that she is unsure whether the pandemic

had any significant impact and was also unsure whether the timing of the impairment had anything to do with the financial crisis in 2020.

When asked about the ability to manage earnings through goodwill impairments she asserts that auditors nowadays question and challenge goodwill assumptions to a high degree, which constraints the flexibility and managerial discretion in the fair value estimation. Additionally, she states that auditors increasingly ask for more documentation and reasoning about the estimation. However, she says there is some flexibility in the current rules that can be exploited despite auditors restricting this flexibility. For example, she states that the flexibility might be exploited by new CEOs to take asset impairments, and she thinks this phenomenon is quite common.

Interview 5

Interviewee 5 gave us an overview of goodwill at his company. It is a traditional organic growth company and goodwill was acquired for the first time in 2019 upon the acquisition of a systems developer and allocated to one of the two existing CGUs which consist of the two main operating segments. The acquired company itself does not generate any revenue stream so the cash flow forecast is primarily based on the projections of the residual pre-existent operating business. The goodwill recognized is an immaterial amount, hence auditors do not perceive it as significant financial line item. The pandemic has had a boosting effect for his company so there were no indications for impairment identified.

He assumes that many other companies have used COVID-19 and the financial crisis as an excuse to undertake an impairment that have previously been avoided or delayed. From a managerial point of view, he believes that an impairment in 2020 might be relatively less reputationally damaging because blame can be directed away from the real reason for the underperformance. When asked about the ability to manage earnings he replies that it may be possible in the short term, but such an ability is constrained by auditors' investigations as they follow up forecasts and compare the assumptions with those of last year.

Interview 6

Interviewee 6 explains that a primary indication for impairment would be a significant deviation from the strategic plans of the operating segments such as the withdrawal of business from a

specific market. Market to book ratio could be an indicator but one has to know that while the market does "say something" about the underlying performance sometimes "there is just a positive momentum with the shares". However, the decrease in market value could be an indication as it reflects the belief of shareholders regarding poor performance. If the market value does decrease below the book value – that is a high indication for impairment.

Even though there was no impairment undertaking in 2020 because the demand for the company's business was not negatively impacted by the pandemic, Interviewee 6 says she would have the ability to manage earnings via goodwill impairments. However, auditors would not only look at the detailed data and discount rate of the current impairment test, but also follow up how the assumptions are reflected in the coming period and challenge these assumptions in terms of how reasonable they are. Hence, one cannot be "too far off" with one's judgement.

At times when the performance is already under expectations one "might as well write-down any goodwill on the balance sheet" according to Interviewee 6. This would be attractive in order to make the balance sheet leaner and improve capital employed and it will be more unnoticed than in a good year. In a general downturn of the economy goodwill is "under the radar" and one does not have to explain as much in front of shareholders.

Interview 7

Interviewee 7 says that the impairment test is highly standardized at her company and the managerial leeway in estimating the parameters is rather small. Since the company is doing very well financially, she does not really pay attention to any metrics as impairment indicators. While the pandemic did impact the sensitivity analysis and the assumptions under a worst-case scenario the headroom for an impairment was still very large. She sees the most potential for opportunistic "tweaking" in the determination of the terminal growth rate and the forecasted EBIT margin. When asked about any scrutiny from auditors Interviewee 7 replies that "there are no questions - not at all".

Incentives to take goodwill impairment according to Interviewee 7 would definitely be that investors are more understanding in times of crisis and "nobody wants to take responsibility for bad results" when "things are going well". Regarding the impairment test in general Interviewee 7 explains that she would rather prefer the old amortization regime since the current

impairment-only approach makes it difficult to “get rid” of huge assets such as goodwill. Amortization would be “healthier”. She finds the impairment approach to be “very theoretical” and all in all a “strange concept”.

Interview Summary

To summarize, most of the interview participants confirm that there is flexibility inherent in the goodwill impairment test and acknowledge their ability to use the discretion to manage earnings to some degree. However, controls such as auditors and audit committees constrain the managerial discretion in their impairment test assumptions, especially when goodwill is a material balance in the financial statements. The interviewees identify numerous incentives to discretionarily recognize goodwill impairments such as cleaning up balance sheets, improving key ratios and improving future earnings level. Moreover, the interview participants seem to be in agreement that in a year of global economic crisis, taking an impairment is more attractive because the macroeconomic environment can be used as a scapegoat for the impairment.

6.2. Quantitative Findings

6.2.1. Diagnostic Test results

In the following section we wish to describe the diagnostic tests we carried out to ensure validity of our regression results.

6.2.1.1. Multicollinearity

Appendix 4 displays the Diagnostic Test for Multicollinearity. The Real Estate Industry Dummy as well as the 2020 Year Dummy have been dropped from the analysis due to perfect collinearity. When analyzing the Variance Inflation Factor, we find that all variables depict a value below 4 whereas most values range between 1 and 2. Hence, we do not detect any issues of multicollinearity affecting the quality of our results.

6.2.1.2. Heteroskedasticity

We analyzed a histogram of our OLS regression as well as conducted a White’s test for heteroskedasticity. The histogram in Appendix 5 depicts that the residuals vary unevenly, thus indicating heteroskedasticity. A white test shown in Appendix 6 with a p-value of 0.00 confirms

that heteroskedasticity is present. Thus, we also include robust standard errors in the execution of our regression models.

6.2.2. Regression results

We aim to investigate the presence of a big bath earnings strategy by analyzing two measures for company earnings – return on assets and return on sales. If earnings levels do not differ between impairers and non-impairers in the two years before the impairment but only in the year of the impairment this could be an indication of big bath earnings management. To test our first hypothesis, we did not only investigate means but also medians to control for extreme outliers. Table 4 depicts the results of our comparison of mean and median ROS and ROA for 2020 and the previous two years for companies that recognized an impairment loss in 2020 and those that did not. For a reasonable inference the same companies for the three years were analyzed, hence, 20 observations were dropped of which we did not have information on impairment in 2018-2020. The p-values refer to a two-tailed t-tests of differences in means and two-tailed Mann-Whitney U-tests of differences in median similar to the approach carried out by AbuGhazaleh, Al-Hares and Roberts (2011).

Table 4: Test of differences in ROA & ROS of impairers compared to non-impairers.

	Impairers			Non-impairers				
	N	Mean	Median	N	Mean	Median	Difference in Mean (p-Value) *	Difference in Median (p-Value) *
2020								
ROA	144	.0791269	.0575941	627	.0639013	.0608101	0.2039	0.7192
ROS	144	.1291619	.09205	627	-1.374544	.0862142	0.6205	0.2637
2019								
ROA	144	0.0741697	0.0679413	627	0.0811935	0.0704481	0.4891	0.7496
ROS	144	0.11051	0.1045775	627	-.1695052	0.0960406	0.6351	0.3254

2018

ROA	144	0.0840367	0.0734681	627	0.0920193	0.0791284	0.5244	0.5329
ROS	144	0.1245999	0.1070787	627	-0.0788061	0.0947285	0.6077	0.3491

*derived from an independent two-tailed t-tests of differences in means.

**derived from a two-tailed Mann-Whitney U-tests of differences in median.

When analyzing our results in Table 4 we find no significant differences in performances between the two groups – neither in 2020, nor in the previous two years. Interestingly, we find that impairers report a superior ROS in all three years of comparison when looking at the mean and the median. The median ROA of impairers is consistently below that of the non-impairers. The mean ROA exceeds that of non-impairers in 2020 while underperforming slightly in the previous years. Hence, we do not find any supporte for our first hypothesis. Relative to non-impairers, the performance of impairers was not significantly lower in the year of goodwill impairment nor in the previous years. With exception of the median ROA in 2020 the impairers performed slightly better overall in 2020 than those companies that did not carry out an impairment. Yet, the ROA (median and mean) was below that of non-impairers in 2018 and 2019 but not significantly when looking at the p-values. Summing up, we did not find any significant difference regarding the two metrics between our comparison groups for any of the years under analysis. In that sense we cannot confirm the findings by Jordan and Clark (2004) or Sevin and Schroeder (2005) that companies use the opportunity in a year of already depressed earnings to carry out an impairment i.e., take a big bath. If that were the case, then there would be a significant difference in performance in 2020 between impairers and non-impairers and none in the previous years.

In order to test our second hypothesis whether there is a stronger association between big bath earnings management and goodwill impairment in times of economic crisis compared to previous more stable years we separate our sample into observations in 2020 – the year of the pandemic – and the previous more stable ten years 2010-2019. The change in GDP controls for the change in the macroeconomic environment between these subsamples. The subsamples include impairers as well as non-impairers of the respective years. Due to the lower limit feature of our dependent variable, we employ a multivariate tobit regression consistent with Hamberg,

Paananen and Novak (2011). Appendix 7a and 7b display our regression results using goodwill impairment scaled by assets at the beginning of the year and at the end of the year as well as results including robust standard errors to address concerns surrounding heteroskedasticity for 2020 and the previous more stable years respectively. Table 5 depicts our summarized findings comparing the determinants of goodwill impairment in the pandemic versus the period before the pandemic.

We find that our Big Bath earnings variable is highly statistically significant in our pandemic sample as well as in the more stable sample. The relationship is positive as expected. The coefficient is higher in magnitude in 2020 compared to the pre-pandemic sample which confirms our second hypothesis. Other significant impairment determinants in both samples are return on assets and firm size. Both, the change of sales and the number of board meetings prove highly statistically significant and somewhat significant in 2020 whereas we find no such significance in the pre-pandemic sample. Contrasting findings also include the independence of the audit committee for which we find statistical significance at the α-level of 5% in the years 2010-2019 but no significant effect in 2020. Moreover, we report opposing effects of our variables leverage, percentage of women on the board and independence of the audit committee in the year of the pandemic compared to the pre-pandemic era. Also, in contrast to our predictions the economic impairment factors book-to-market ratio, return on assets, change in Operating Cash Flow and, interestingly, CEO Tenure as proxy for managerial discretion display the opposite effect on goodwill impairment.

Table 5: Summarized Results from the multivariate Tobit regression.

		Pandemic	Pre-pandemic
	Expected sign	2020	2010-2019
Constant		-0.415***	-0.102***
		(0.0446)	(0.00643)
BIGBATH	+	0.0782***	0.0269***
		(0.0191)	(0.00303)
BTM	+	-0.00133	-3.32e-05
		(0.00132)	(8.99e-05)

CSALES	-	-0.275***	-0.000365
		(0.0496)	(0.000631)
COCF	-	0.000529	4.61e-05
		(0.000723)	(7.09e-05)
ROA	-	0.980***	0.0263***
		(0.0418)	(0.00705)
SMOOTH	+	0.00695	0.000778
		(0.0146)	(0.00187)
LEVERAGE	+/-	-0.000157	1.20e-07
		(0.000196)	(7.50e-08)
CEOTENURE	-	0.000781	0.000179
		(0.00120)	(0.000194)
CEOSHARE	+/-	-0.000793	-0.000258
		(0.00287)	(0.000267)
WOMEN	+/-	0.000301	-8.32e-05
		(0.000561)	(7.68e-05)
BOARDIDP_AUD	+/-	-0.000342	6.51e-05**
		(0.000226)	(2.61e-05)
BOARDMEETINGS	+/-	0.00236*	0.000182
		(0.00141)	(0.000205)
FIRMSIZE		0.0201***	0.00385***
		(0.00423)	(0.000553)
GOODWILL		0.0449	0.0227***
		(0.0463)	(0.00629)
GDP		-0.110	-0.0559
		(0.246)	(0.0451)
Industry Controls		Yes	Yes

Year Controls	Yes	Yes
Observations	750	6,681

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Dependent variable is Goodwill scaled by total assets at the end of the year.

For the analysis of discretionary goodwill impairment as part of our final hypothesis test, we run an OLS regression using only the economic impairment factors on the whole sample for the years 2010-2020 following Gros and Koch (2019). We focused the execution of this model on goodwill scaled by total assets at the end of the fiscal year to avoid making the study too extensive. To ensure the robustness of our results we also carried out the regression including robust standard errors clustered at ISIN (firm) level. Results of the regression are depicted in the Appendix 8. The derived estimates were used to predict the economically induced or "expected" goodwill impairment. Consistent with Lapointe-Antunes, Cormier and Magnan (2008) we replace the economically induced goodwill with zero if the prediction resulted in a negative amount since this would imply a reversal of impairment. The expected impairment is multiplied by total assets to arrive at the absolute amount and deducted from the reported impairment amount to calculate the discretionary goodwill impairment. Thereafter, the discretionary goodwill impairment is employed as dependent variable in an OLS regression on our sample in 2020 using the proxies for managerial discretion and corporate governance described in Section 5.1.3. In order to understand the dynamics of the effects the different variables more we also investigated negative and positive discretionary goodwill impairment.

Table 6: Results of the OLS model on discretionary goodwill impairment

VARIABLES	DiscGIMP	DiscGIMP	negDiscGIMP (Understatement of impairment)	posDiscGIMP (Overstatement of impairment)
Constant	935.6***	935.6**	1,149***	-213.1***
	(227.0)	(374.5)	(212.3)	(62.87)
BIGBATH	188.1	188.1	135.6	52.58
	(122.2)	(175.9)	(114.3)	(33.84)

SMOOTH	40.36	40.36	51.35	-10.99
	(94.70)	(133.3)	(88.56)	(26.23)
LEVERAGE	0.00674	0.00674	0.00956	-0.00283
	(0.221)	(0.0495)	(0.206)	(0.0611)
CEOTENURE	-37.74***	-37.74	-33.98***	-3.761
	(9.146)	(26.50)	(8.553)	(2.533)
CEOSHARE	-2.390	-2.390	-1.997	-0.392
	(20.16)	(11.72)	(18.85)	(5.582)
WOMEN	15.07***	15.07*	17.16***	-2.093*
	(3.975)	(9.089)	(3.717)	(1.101)
BOARDIDP_AUD	-2.864*	-2.864**	-2.665*	-0.199
	(1.624)	(1.196)	(1.519)	(0.450)
BOARDMEETINGS	22.40**	22.40	13.30	9.103***
	(10.20)	(16.85)	(9.535)	(2.824)
FIRMSIZE	-181.5***	-181.5**	-212.2***	30.78***
	(27.54)	(72.29)	(25.76)	(7.627)
GOODWILL	617.7**	617.7**	569.4*	48.38
	(311.1)	(240.4)	(291.0)	(86.17)
Industry Controls	Yes	Yes	Yes	Yes
Year Controls	Yes	Yes	Yes	Yes
Robust Standard Errors	No	Clustered at ISIN	No	No
Observations	750	750	750	750
R-squared	0.149	0.149	0.192	0.074

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

When analyzing the results in Table 6 regarding the Big Bath variable we find a positive correlation which supports our third hypothesis, however we do not find any statistically

significant effect. Moreover, the magnitude of the effect seems to be driven by the association of our variable with negative rather than positive discretionary goodwill. Significant determinants of discretionary goodwill impairment seem to be CEO Tenure, percentage of women on the board, independence of the audit committee and the number of board meetings. Concerning CEO Tenure, we observe a highly significant negative effect which is in contrast to our findings in Table 5 of our tobit regression. The inference of this effect becomes more concrete when looking at the regression on negative discretionary goodwill impairment where CEO Tenure remains highly statistically significant and negative. The reported sign of this variable is now in line with earlier predictions. This supports findings by Beatty & Weber (2006) that CEOs that have been in their position longer are more likely to have authorized the acquisition decision which may now be subject to impairment and are reluctant to recognize such a loss since it may be perceived as a failure or a poor acquisition decision by the market. This could motivate them understate impairment compared to that which is economically warranted. The percentage of women on the board seems to have a highly statistically positive effect on discretionary goodwill impairment. This effect seems to be dominated by the effect on negative goodwill impairment i.e., the understatement of impairment, however, we also find a somewhat statistically significant negative effect on positive goodwill impairment i.e., overstatement. Regarding the independence of board members of the audit committee we report a negative effect on the understatement of impairment significant at an α-level of 10%. This means that an increasing percentage of independent board member on the audit committee results in less understatement of impairment indicating a disciplining function to managers that may have reputational motives to minimize the impairment charge. The last noteworthy finding from this regression is the coefficient of the number of board meetings. We find a statistically significant positive effect on discretionary goodwill impairment overall and even a highly significant effect on positive discretionary impairment.

7. Analysis

The results of our first hypothesis test leave us wondering what the reasons for these findings in contrast to previous studies could be. It is noteworthy that the studies that have taken the same research approach, namely Jordan and Clark (2004) and Sevin and Schroeder (2005) focused their research on a US sample and more specifically, on the year of adoption of SFAS 142 in 2002. They find significant differences in the median ROA and ROS between impairers and non-impairers in 2002 but not in 2001 pointing towards management taking an impairment because the financial situation is generally already poor and not because performance has been deteriorating for some time. While poor earnings levels per se boast an opportunity to reduce earnings even more by "removing any burden" and, hence, boosting future earnings (Jordan & Clark, 2004), there was also another incentive to write-down in 2002 which could have somewhat affected the inference of findings in these studies. In 2002, companies could report initial impairment charges as accounting changes below the bottom line, thus, not affecting operating income which definitely formed an incentive to undertake an impairment. Nowadays impairment losses go through profit and loss and negatively affect reported earnings levels. This clearly creates a "steeper penalty" (Jordan & Clar, 2004, p. 69).

In addition, while Jordan & Clark (2004) hypothesized that an impairment may be warranted after multiple periods of plummeting firm economics, we find that - based on our Interviews with practitioners - the impairment test is rather detached from current or past company performance. Naturally, the cash flow forecast is somewhat oriented on past numbers, however, the estimation of the value in use as a whole is primarily a forward-looking exercise. The assumptions regarding growth rate and forecasted EBIT margin are based on what management expects the market outlook to be in the future. Interviewee 1 also emphasized that it is "solely about the future" when asked about the impact of the pandemic on the estimations. Two of our interviewees' companies recognized a goodwill impairment but both explained that this was unrelated to the pandemic because they believe it will not have any long-term negative effect on revenue. We gain the overall impression that either the pandemic has not had a negative effect on business at all – some industries even benefitted from the developments that the COVID-19 measures brought - or the adverse effect on business is not perceived to be so long-lasting as to significantly affect the future cash flow estimation.

In conclusion, our results suggest that the majority of companies that chose to impair goodwill in 2020 did not do so because their reported earnings were already depressed and saw it as an opportunity to take a big bath - this would have meant a significant lower performance than non-impaired in 2020 - but did so based on the estimated future outlook of their CGUs independent of any short-term effects that the outbreak of COVID-19 may have had on the 2020 financial results. This would explain why there is no significant difference in ROS and ROA neither in 2020, nor in the previous two years, between companies that reported a goodwill impairment in 2020 and those that did not. In fact, we find that only 39 out of the 144 impairers in 2020 reported negative pre-impairment earnings. Our findings confirm claims made by Xu and Rogers (2011) as well as Aubert and Grudnitski (2014) who suggest a shift away from such earnings management tactics.

Our quantitative findings in Table 5 suggest that our big bath earnings variable is more strongly associated with goodwill impairment in the year of the pandemic compared to previous more stable years. When questioning why this may be the case, we turn to the insights gained from our interviews. Interviewees mention cleaning up the balance sheet, getting rid of assets which were on the edge of being written down anyway, improving earnings levels and capital employed going forward as general incentives to impair discretionarily when earnings are already poor. But in a year of global economic downturn such as 2020 they say recognizing an impairment is more attractive because the macroeconomic changes can be used as scapegoats, the focus from the external market would be shifted towards the negative financial effects caused by COVID-19 which are out of management's control. Furthermore, one interviewee says that he believes that an impairment in 2020 might be relatively less reputationally damaging because blame can be directed away from the real reason for the underperformance. In such a year, impairment losses would go more unnoticed since goodwill is "under the radar" according to a different interviewee. That the change in sales has played a significant role in determining impairments in 2020 does not come as a surprise. Closures of shops or restrictions on purchasing of a specific product caused by COVID-19 restrictions will first and foremost affect sales. The question is whether these effects are believed to be so significant in the future to adversely affect future cash flow estimation in the determination of value in use. Regarding the relationship between CEO Tenure and goodwill impairment we cannot confirm findings by Beatty and Weber (2006) since we find a positive relationship. For the results relating to 2020 we argue that possibly long serving CEOs who, under normal circumstances, would be reluctant

to admit that the acquisition they originally made has turned out to be not as fruitful as they had hoped can now escape accountability by blaming the undesired development on external factors.

Table 6 reports that the magnitude of the relationship between goodwill impairment and our big bath earnings variable seems to be higher related to negative discretionary goodwill impairment rather than positive impairment. This finding could indicate that companies which reported negative pre-impairment earnings in 2020 exploited the discretion inherent in the impairment test more to understate impairment i.e., to impair less than what is economically induced – maybe not to make the financial situation worse than it already is - rather than to overstate impairment and take a big bath. We have to keep in mind that our big bath variable is an indicator variable measuring whether the company reported negative pre-impairment earnings which would pose the opportunity to take the big bath but does not measure taking the big bath per se.

The findings gained from the conducted interviews have not only broadened our understanding of the execution of the impairment test in practice but also assisted our inference of our quantitative findings as to why companies would impair in 2020 and gave validation to our variables. Multiple interviewees mentioned the audit committee as a factor of restraining managerial leeway in the assumptions required in the impairment test. We believe that this disciplining effect is most likely enhanced when the audit committee consists of independent board members who are not entrenched. Interviewee 2 describes a past occupation at an organization where the chairman of the audit committee was actively interfering in the value in use estimations and describing how to minimize WACC to avoid an impairment. Possibly this director was not independent which would once more highlight the importance of independent actors for effective oversight and justifies a respective variable in our regression models.

Moreover, interviewees mentioned the book-to-market ratio, return on assets and sales as considerable factors in their impairment test, hence these inputs validate the inclusion of such variables. Interestingly, interviewee 3 mentions market capitalization as reference point for the estimated value in use. In theory, market capitalization stipulates what the market thinks a company is worth so should equal what a market participant is willing to pay for a company i.e., fair value, however, the market capitalization based on the share price reflects market expectations which can also be highly speculative. In this sense another interviewee relativizes

the informative value of market capitalization as she says the share price could just depict a "momentum" of the market expectations and is only partially related to the underlying performance of a company.

The overall impression gained from the practitioners is that it is not that easy to exploit the discretion inherent in impairment testing and the preparers are very aware of the governance mechanisms such as auditors and board directors. Nearly all interviewees mention the scrutiny exercised by auditors and their questioning of assumptions as main mitigating factors for opportunistic behavior. Only interviewee 2 relativizes the auditors' function by saying that they only really challenge significant changes to assumptions compared to the previous year and interviewee 7 explains that auditors do not question the impairment test at all. The preparers we spoke to seem to be rather cautious in their impairment tests. One interviewee described that they undertake overly extensive sensitivity analysis. All interviewees identify similar incentives why it may be attractive to undertake an impairment in 2020: to use COVID-19 as a scapegoat. Such an opportunistic exploitation of the general economic downturn by means of impairment, nevertheless, may only pose an opportunity for companies that hold goodwill that has been on the edge of being impaired. However, most of the companies interviewed seem to have considerable headroom in their goodwill so that an impairment is very unlikely in the near future.

8. Discussion and Conclusion

Using a sample of 8,974 firm-year observations of European companies between 2010 and 2020, this research paper sought to investigate whether goodwill impairment in 2020 primarily was a result of the economic impacts caused by COVID-19 or managerial discretion. The findings from the test of differences (H1) suggests that the majority of the firms that recognized a goodwill impairment loss in 2020 did not do so because of big bath earnings management. There was no significant difference in ROS and ROA between companies that reported a goodwill impairment in 2020 and those that did not, neither in 2020 nor in the previous two years, indicating that the majority of firms taking a goodwill impairment charge in 2020 did not have an already depressed earnings situation to take advantage of but conducted an impairment based on their assessment of future earnings. These findings are consistent with the insights gained by interviews with practitioners.

Nevertheless, the results of our tobit regression (H2) suggest that big bath earnings management is a significant goodwill impairment determinant. This finding implies that those companies that reported negative pre-impairment earnings did in fact recognize a goodwill impairment indicating a big bath. Moreover, the association between big bath and goodwill impairment was stronger in 2020 compared to previous years. Several interviewees underscored that a potential explanation for this may be that a financial crisis provides an extraordinary situation that managers can use in order to escape accountability for CGU underperformance. The test of H2 also shows that a change in sales is a significant goodwill impairment determinant, which is logical considering a negative change in sales may influence growth and future cash flow estimates.

The OLS regression (H3) shows that the magnitude of the relationship between goodwill impairment and big bath is more related to negative discretionary goodwill impairment than positive impairment. The result suggests that firms which reported negative pre-impairment earnings in 2020 exploited the discretion inherent in the impairment test more to understate impairment, which leads to the rejection of our third hypothesis of big bath earnings management. These findings suggests that the use of goodwill impairment to pursue big bath earnings management was not as prevalent as hypothesized. On a grand scale it seems that European companies used the discretion in 2020 to impair less than predicted economically induced goodwill impairment.

The interview results showed strong support for the notion that possibilities exist to exploit the discretion inherent in impairment testing accounting rules. A common view among the interview participants, however, is that governance and enforcement mechanisms such as auditors and board directors significantly limit the exploitation of discretion. As evidenced by multiple interviewees, there is a perceived incentive for managers to take big bath goodwill impairments in order to improve earnings levels and ratios such as return on assets. Additionally, several managers stated that it may be more favorable to recognize an impairment during times of financial crisis as the macroeconomic environment can be used as a scapegoat. These hypotheses, however, did not find support in our quantitative analysis which suggests companies understated impairments in 2020 rather than using it to take a big bath.

The results, which showed that big bath is a significant determinant of goodwill impairment and that companies may have understated goodwill impairments in 2020, highlights the challenges and issues with the discretion inherent in IFRS goodwill accounting rules. The implications are that managers and firms have the ability to act opportunistically to some extent and manage earnings with goodwill impairments. It highlights the need for regulators and enforcers to identify procedures and systems to limit the discretion in order to improve goodwill accounting accuracy and reliability. For instance, more extensive goodwill impairment test disclosure requirements in annual reports would increase transparency in this area. Along with rigorous enforcement, this may mitigate some of the issues with the current accounting rules.

While this study incorporated corporate governance mechanisms as control variables, the interpretation and inference on the effectiveness of these mechanisms is out of scope of this study. Thus, the discussion of these factors is limited in this paper. Future research could investigate the effect of corporate governance mechanisms on discretionary goodwill impairment in more depth. For example, it could be interesting to investigate how the percentage of women on the board affects discretionary goodwill impairments as the inference of our results are unclear. Also, a more detailed analysis of discretionary goodwill as predicted by our regression model with further investigation of the variables, or the inclusion of interaction terms may bring further insights. Unfortunately, such an endeavor as part of a larger study was not feasible given the available resources and time constraints. Moreover, it would also be interesting to conduct a similar study in a similar COVID-19 context in the United States as this would enable analysis and comparisons of discretionary goodwill impairments in the accounting regimes.

This study predicted economically induced impairment based on current and historic economic metrics whereas the value in use is very forward looking. Future research could potentially improve estimates and insights about economically induced goodwill significantly by incorporating forward-looking economic predictors in regression models. Finally, building upon the comment letters submitted to the IASB on possible changes to IFRS 3 several interviewees expressed preference of the old amortization regime as it is more straight forward, less complex and costly to perform, and makes it easier to unload goodwill from the balance sheet. Further study of advantages of a return to the former regime or a combined approach could be value adding to the debate.

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Appendix

Appendix 1: Overview of previous research techniques on goodwill impairment

Author (Year of publication)	Research question(s)	Research Method	Variables	Sample
AbuGhazaleh, Al-Hares and Roberts (2011)	What are the determinants of goodwill impairment losses? Does managerial discretion reflect opportunistic reporting by managers or the provision of their private information?	A one-stage multivariate pooled tobit regression to examine the determinants of goodwill impairment losses.	Actual (Economic) impairment proxies: book to market, size of goodwill, number of cash-generating units, change in turnover, change in operating cash flows, and ROA. Proxies for Managerial Discretion: Leverage, big bath and income smoothing, management change. Proxies for corporate governance: board independence, separate chairman, activity, block holders, and shares held by executive and non-executive directors.	Sample of 528 firm year observations, drawn from the top 500 U.K. listed firms for 2005-2006.
Avallone & Quagli (2015)	What are the variables used by managers through the impairment test to avoid or reduce goodwill write-offs?	A tobit regression and a logistic regression of the amount of reported goodwill impairment losses and the simple recognition of goodwill losses, respectively, on the future cash flows, the estimations used for both WACC and the long-term growth rate in the impairment test.	Price-to-book firm value for firm, the difference between the average WACC ratio actually used in the impairment test and the WACC ratio re-estimated using the information publicly available from external sources, the difference between the average growth ratio actually used in the impairment test and the growth ratio re-estimated using the information publicly available from external sources, log of total assets, leverage	Sample of highly capitalized European listed companies (from Germany, Italy, and UK) with book goodwill over the period 2007–2011.

			ratio for firm i estimated as the ratio between total debt and total assets, return of assets, change in the CEO during the year, book goodwill for firm	
Beatty & Weber (2006)	What factors affect management's decision to accelerate a goodwill impairment charge as an SFAS 142 below-the-line cumulative effect as opposed to delaying the recognition of impairments into future above-the-line charges?	Two managerial choices are studied: 1) using a probit model to identify covariates of the decision to record a transition charge. 2) using a censored regression to estimate how these same proxies are associated with the magnitude of the charge.	Dependent variables: Goodwill Impairment. Hypothesized determinants of write-offs: Debt covenant slack, CEO bonus, CEO tenure, firm size, leverage among other proxies.	A sample of US 867 firms with a goodwill balance and a difference between the market and book value of their equity that is less than their recorded goodwill. The sample includes firms that are relatively more likely to take goodwill write-offs.
Bens, Heltzer and Segal (2011)	How did the adoption of SFAS 142 alter the information content of goodwill write-offs?	To more accurately capture the information of goodwill write-offs, the authors first create a model to estimate expected impairments. The difference between actual write-offs and expected write-offs represents write-off surprises or unexpected goodwill write-offs. They use a temporal explanatory analysis to examine information content pre-142 and post-142, combined with cross-sectional tests to determine the association between returns and write-	Dependent variable: abnormal returns after impairment loss announcements. Independent variables: information asymmetry, the ability of the firm to efficiently implement impairment tests and firm complexity proxied by analyst following, firm size and number of reported segments respectively.	Sample of US firms that took intangible asset write-offs of at least 5% of lagged assets over the period 1996–2006.

		offs varies with firm characteristics.		
Carlin and Finch (2010)	To what extent do firms exercise opportunistic discretion in discount rate selection when undertaking goodwill impairment testing?	The authors use an empirical archival approach. Independent risk-adjusted company discount rates are estimated for the firm sample. An analysis of variances between these rates and those used by sample firms are done to examine if there is evidence of potential opportunism in discount rate selection.	Independent risk-adjusted company discount rates via the capital asset pricing model vs. actual discount rates used by sample firms in impairment testing.	A sample of 124 Australian and New Zealand listed firms in 2007.
Chen, Kohlbeck and Warfield (2008)	How is the timeliness of impairment recognition affected by SFAS 142 adoption?	The authors use a regression of return/earnings to examine the association between the SFAS 142 impairments recognized in 2002 with current and prior years' returns. A reverse regression of earnings on current and past returns to examine	Impairments are incorporated for each firm-year observation to test for timeliness. The impairment amounts are then interacted with year indicator variables to capture differential timeliness. Indicators include: Goodwill/assets, Assets, book value of equity, Market value of	Sample of 1763 US firms, 726 of which report goodwill impairments at the end of 2001.

		earnings recognition lag is also undertaken.	equity, Market to book value of equity, Annual return, Size-adjusted annual return, Income before extraordinary items and impairments, Adoption impairment, Year 1 impairment, Total impairments, Income before extraordinary items & Return on assets.	
Darrough, Guler and Wang (2014)	Are CEO compensation reduced when fair values of acquired business units are written down?	Univariate analysis and Multivariate analysis.	Dependent variable is CEO compensation (Cash, options or restricted stock compensations) independent variables are actors specific to the firm (stock performance, return on assets, size, etc.), the acquisitions (write-down, restructure, etc.) and the CEO (tenure etc.).	Sample of 3,572 US firm-years with goodwill and 2,670 firm-year observations with no goodwill impairments for the years 2002 to 2009.
Filip, Lobo and Paugam, (2021)	Are goodwill non-impairment decisions opportunistically exercised through overly optimistic valuation assumptions and future cash flow forecasts? Do enforcement constraints influence impairment decisions?	Univariate and multivariate descriptive statistics.		3,916 firm-year observations from 36 countries between 2007 and 2014 that require reporting under IFRS.

Francis, Douglas & Linda (1996)	What are the determinants of managements' write-off decisions? What are the security price reactions to firms' write-off announcements?	Multivariate Analysis of the Factors Influencing Write-Offs (Specific Tobit Models)	Numerous proxies such: Prior Five-Year Return (%), Ind.-Adj. Book-to-Market (%), Change in Book-to-Market (%), Change in Return-on-Assets (%), Industry Sales Growth (%), Change Ind. Book-to-Market (%), Change Ind. Return-on-Assets. For stock market reactions: Amount of Write-Off/Assets, Unexpected Earnings/Assets, Change in Dividends/Assets, Unusual Gain/Assets, Unusual Loss/Assets, Log of Sales Revenue	3,909 potential write-off announcements of US firms
Giner and Pardo (2015)	How Ethical are Managers' Goodwill Impairment Decisions in Spanish-Listed Firms?	Probit regression to assess the probability of firms impairing goodwill and goodwill and OLS regression to examine the amount of goodwill that was actually impaired and a tobit regression that included all firm-year observations.	Dependent variables in the probit model: goodwill impairment as 1 (0 if not), and in the OLS and tobit models: reported goodwill impairment loss. Independent variables in the probit and OLS models: leverage ratio, smoothing, carrying amount of goodwill, adjusted return on equity, market return, expected goodwill impairment. Dichotomous variables: Goodwill impairment loss, big bath is an indicator variable that takes a value of 1 if pre-impairment earnings are negative at time t and lower than earnings at time t - 1, auditor is an indicator	A sample of Spanish-listed companies between 2005 and 2011. The sample compromise 663 firm-year observations.

			variable that takes a value of 1 if it is a Big4 auditing firm, etc.	
Gros and Koch (2019)	What are the determinants of discretionary goodwill impairments?	The authors split goodwill impairment losses into economically induced and discretionary by running a regression of the realized goodwill impairment losses on the economic determinants of goodwill impairments to identify economically induced goodwill impairment losses. The difference between economic and reported goodwill is considered discretionary goodwill. Then determinants of discretionary goodwill impairments are examined through an OLS panel regression.	The model used to examine economic goodwill have independent variables such as share return, return on assets, earnings per share forecast, operating cash flow, market-to-book, leverage (liabilities/assets), size, and dummy variables such as profit warnings, negative income the year prior to impairment. Discretionary goodwill has independent variables such as: share return, board experience, country specific enforcement score, size (assets), debt, ratio of shares in free float to total number of shares, smoothing as the absolute value of the positive change in scaled EBIT, big bath as the absolute value of the negative change in scaled EBIT, and management change as a dummy variable.	A sample of 2,485 firm-years observations of EURO STOXX 600 companies between 2007-2013.
Hamberg, Paananen & Novak (2011)	How did managers use their discretion in association with the first-time adoption of IFRS 3?	The authors use a probit regression to test variables connected with the decision to impair goodwill.	Independent variable is goodwill impairment and dependent variables are proxies for debt constraints, managerial equity-market concerns, managerial earnings-based compensation, tenure, etc.	A sample of 1 691 firm-year observations between 2001-2007 of firms listed on the Stockholm Stock Exchange.

Hayn & Hughes (2006)	Are investors able to estimate goodwill write-offs and financial performance of acquired firms based on financial disclosures?	A regression model to predict goodwill write-offs through acquisition characteristics and performance indicators.	Acquisition characteristics variables include premium paid, if there were multiple bidders, goodwill as % of acquisition cost and performance indicators include variables such as return on assets, change in sales, etc.	1276 acquisitions and goodwill write-offs of US publicly traded companies between 1988-1998.
Henning, Shaw & Stock (2004)	Are firms given too much discretion in the determination of the amount and timing of goodwill write-offs?	Logit regression analysis.	Independent variables include book values of liabilities and preferred stock during the acquisition year, book value of assets minus the book value of purchased goodwill, etc.	A sample of 171 UK and US firms that announced an impairment of goodwill or intangible asset revaluation between 1990-2001.
Hirschey & Richardson, 2002	What is the market-value effects of goodwill write-off announcements?	A standard event-study methodology.	Dependent variables are goodwill impairment announcements, and the independent variable is abnormal stock market returns.	A sample of 80 goodwill impairment announcements by US firms between 1992-1996.
Jarva (2009)	Are SFAS 142 goodwill write-offs associated with future expected cash flows as mandated by the standard?	A regression analysis of 1-3 future year operating cash flows after goodwill write-offs.	The independent variable is goodwill write-off, and the dependent variable is the realized cash flows as a proxy for managers' expectations of cash flow.	327 firm-year observations for US stock-listed companies that took goodwill write-offs between 2002-2006 and a control sample of 9,960 firm-year observations without goodwill impairment.
Jordan and Clark's (2004)	Do firms pursue big bath earnings management following CEO change?	Chi-square tests and T-tests to examine if new CEOs used goodwill impairments to accomplish big bath earnings management.	Dependent variable is goodwill impairment and independent variable CEO change.	A sample of 244 Fortune 500 companies that changed CEO 2003-2013.

Knauer and Wöhrmann (2016)	Are capital market reactions upon announcements of goodwill impairment associated with the likelihood of opportunistic disclosure?	An event-study design and regression model that analyze the association between abnormal returns and the amount of unexpected goodwill write-off.	The main dependent variable is cumulative abnormal returns, independent variables include unexpected goodwill write-off among other factors.	A sample of 564 goodwill write-down under either IAS 36 or SFAS 142 announcements between 2005-2009.
Lapointe-Antunes (2008)	Can reporting incentives and constraints be associated with the magnitude of transitional goodwill impairment losses reported by Canadian firms?	A multivariate tobit model to assess the determinants of transitional goodwill impairment losses.	Dependent variable is reported transitional goodwill impairment loss deflated by lagged total assets. Independent variables include return on equity, Percentage of acquisitions financed entirely with cash or debt change of CEO for the years preceding the adoption of Section 3062, number of reporting units, etc.	All firms listed on the TSX that report under Canadian GAAP and have a positive goodwill balance at the year-end preceding the adoption of Section 3062. The sample consists of 331 firms.
Lee (2011)	Does SFAS 142's treatment for goodwill enhances or dampens the ability of goodwill to predict future cash flows? What effect does managerial reporting discretion have on goodwill's ability to predict future cash flows?	Regression analysis models.	Using one-year and two-year ahead cash flows as dependent variables and independent variables such as net income etc.	A sample of 4825 US firms and 13,848 firm-year observations for the years 1995-2006.
Li & Sloan (2017)	What is the impact of SFAS 142 on the accounting for and valuation of goodwill?	Frequency analysis of impairments and cross-sectional regressions of future stock returns on the financial indicator for goodwill impairments.	Future stock returns as dependent variable and goodwill impairment as independent variable controlling for proxies for information environment through	A pre-142 subsample of 9049 firm-year observations with positive beginning goodwill balances from 1996 to 2000 and a post-142 subsample that includes 19,290

				firm-year observations with positive goodwill balances from 2004 to 2011.
Li, Shroff, Venkataraman & Zhang (2011)	What is the market reaction to the announcement of a goodwill impairment loss? Can the cause of goodwill impairment be traced back to overpayment for targets of prior acquisitions?	An abnormal returns event study and a tobit regression.	Goodwill impairment as dependent variable is examined using proxies for overpayment such as acquisition book value premium, stock payments by overvalued bidders, unrelated acquisitions, etc.	A sample of 1584 impairments by US firms 1996-2006.
Masters-Stout, Costigan & Lovata, 2008	Do newer CEOs impair more goodwill than their senior counterparts?	Multiple regression models.	Goodwill impairment as dependent variable and CEO tenure as the primary independent variable.	A sample of 990 firm-year observations of Fortune 500 companies during 2003–2005
Ramanna & Watts, 2012	Does management exploit the impairment regime to align reporting with personal incentives or is it used to convey private information that management has on the development of acquisitions?	Multivariate regression analysis of firms with market indications of impairment based on the development of the firm's market-to-book ratio of goodwill but did not report an impairment and determinants of non-impairment 2003-2006.	Determinants of goodwill non-impairment are examined using proxies for private information motives, contracting motives, reputation motives, reporting flexibility, etc.	A sample of US firms with market indications (book goodwill and equity-to-market ratio higher than equity-to-book ratio) of goodwill impairment between 2003-2006.
Riedl, 2004	What are the determinants of asset write-downs before and after the introduction of SFAS 121?	A tobit regression.	Dependent variable is long-lived asset write off and independent variables include leverage, change in	A sample of 5180 firm-year observations of US companies 1992-1998.

			sales, proxies for big bath, etc.	
Sevin and Schroeder (2005)	Does SFAS No. 142 allow for the earnings management technique termed "big bath"? Does firm size play a role in earnings management?	An analysis of goodwill impairments, comparing financial metrics, and calculating the proportion of firms with negative versus positive earnings.	Independent variables such as goodwill to total assets, return on assets and return on sales are financial metrics used.	A random selection of US companies that made goodwill impairments in 2002 and 82 firms that did not impair.
Siggelkow & Zülch, 2013	What factors influence the write-off decisions in German-listed companies?	A probit regression to find the impairment incentives.	Goodwill impairment as dependent variable and independent variables include leverage, profitability, cash-flow and market-to-book ratios.	A sample of 805 firm-year observations of German firms 2004-2010.
Van den Poel et al. (2009)	Are firms more likely to take a goodwill impairment when their earnings are 'unexpectedly' low or high?	Regression analysis.	Determinants of goodwill impairment including independent variables such as auditors and legal environments.	2,622 firm-year observations from listed companies in 15 EU countries preparing financial statements under IFRS in the period 2005-2006.
Verriest & Gaeremynck (2009)	What are the goodwill impairment determinants? Including goodwill impairment disclosures.	Multiple regression models.	Impairment as dependent variable and independent variables include free float of shares, the percentage of independent members on the board, etc.	A sample of 62 FTSE 300 companies.
Wells (2002)	Does CEO tenure effect earnings management?	Regression analysis and quantitative tests of CEO changes.	Dependent variable are XX independent variables are XX	A sample of Australian firms listed on ASX between 1984 and 1994
Xu, Anandarajan and Curatola (2011)	Are goodwill impairments value relevant?	A price model and a return model.	The price model uses earnings and book value to explain share price. The return model is based on the price model and adds	A sample of 431 US firm-year observations with goodwill impairment charges

			change in sales and change in return on assets.	recognized 2003-2006.
Zang, 2008	Do managers manipulate the transitional goodwill impairment loss upon adoption of SFAS 142 and if so, why? How does the stock market react to the announcement of transitional impairment and increased earnings due to the eliminated amortization?	In an event-study framework tobit model is used to test for earnings management.	Two managerial discretionary variables are used: firm leverage and change in management to investigate cross-sectional variations in the initial impairment loss after controlling for the actual economic goodwill impairments proxied by variables such as past asset and stock performance, size, industry, etc.	A sample of 870 firms that completed a transitional goodwill impairment test in the adoption year.
Zucca and Campbell (1992)	Does a timing pattern of goodwill impairments exist?	Information content study and a random walk model. Quantitative test of earnings management by calculating expected earnings levels of sample firms, simple regression analysis on whether write-down firms engage in merger activity, a one-way analysis of variance of financial health.	Financial health of firms wase measured at 6 points in time the years before and after the write-down through the following financial variables: Cash Dividend Growth, Earnings/Price Ratio, Debt to Equity Ratio, and Quarterly Return on Assets.	77 write-downs taken by 67 firms 1978- 1983.

Appendix 2: Interview Questions

General impairment test related questions

- Who is responsible for the execution of the impairment test, more specifically: the determination of the recoverable amount (value in use?)? The discount rate?
- What would be indications for an impairment at [company name]? Do metrics such as market-to-book ratios or return on assets play a role?
- How are management estimates considered in the calculation? Who is involved in the process gives input on future cash flows, for example? Are any third parties consulted?
- What factors are considered when estimating future cash flows? How long is the explicit forecast period?
- How many CGU containing goodwill does [company name] employ?
- Who decides on the allocation of goodwill to CGU upon acquisitions?

Impairment in 2020

- Has a goodwill impairment been identified in 2020?
    - If yes, what were the causes?
    - If not, why?
- Has Covid-19 affected the estimation of the value in use? If so, how?
- Has the CGU been underperforming for the periods prior to the impairment?

Discretion in impairment testing

- Given the flexibility of discretion inherent in the IAS 36 impairment test, do you think you have the ability to manage earnings if you wished to do so by managing goodwill impairments? I.e. by making overly optimistic/pessimistic value assumptions.
- Past research on goodwill impairment finds that goodwill impairment losses are recognized above predicted economically induced impairments (Gros & Koch, 2019; Ramanna & Watts, 2012). Why do you think this is the case? Do factors such as leverage, potential market reactions or CEO tenure influence the impairment decision?
- Do you think the financial crisis caused by Covid-19 can be used as a scapegoat for poor performance of acquired business units and be used to justify goodwill impairment?
- Do shareholders generally tend to question impairment losses i.e. is there a need for detailed justification (beyond disclosures in the financial report)?
- If a goodwill impairment is identified, is it more attractive to recognize such a loss when earnings levels are already depressed? Why?
- Have investors generally been more accepting of goodwill impairments taken in times of general economic downturn?
- Can you identify any incentives you may have had to take **discretionary** goodwill impairments in 2020?

Appendix 3: Interview Overview

Interview ID	Country	Industry	Position of interviewee	Relation to goodwill impairment
1	Sweden	Consumer Discretionary	Head of Group Accounting & Business Control	Full responsibility for impairment test: determination of future cash flows and discount rate. Future cash flows are based on prospective CGU budget which is signed off by the board. Cost of equity is calculated with input from external parties: banks, auditors, etc.
2	Sweden	Industrials	CFO & Head of IR	Full responsible for the impairment test, all "critical" assumptions, asset data and firm-specific risk oriented at peers i.e. firms with similar market cap, market risk based on risk premium study by PwC & 10-year Swedish bonds
3	Sweden	Industrials	Head of Corporate Control	Responsible for corporate control function of the company group, responsible for impairment test execution, help from the M&A department to calculate WACC, the other assumptions are prepared by the accounting department.
4	Sweden	Industrials	Head of Group Finance	Responsible for group finance and highly involved in impairment testing in collaboration with group finance team.
5	Sweden	Consumer Discretionary	Business Finance Manager	Contact for related discussions with auditors, involvement in preparation of impairment test in collaboration with CFO
6	Sweden	Industrials	Director of Group Financial Control	Practical execution of impairment test, estimation cash flow forecast, estimation of discount rate: collaboration with CFO, CFO is "highly" involved as well as audit committee

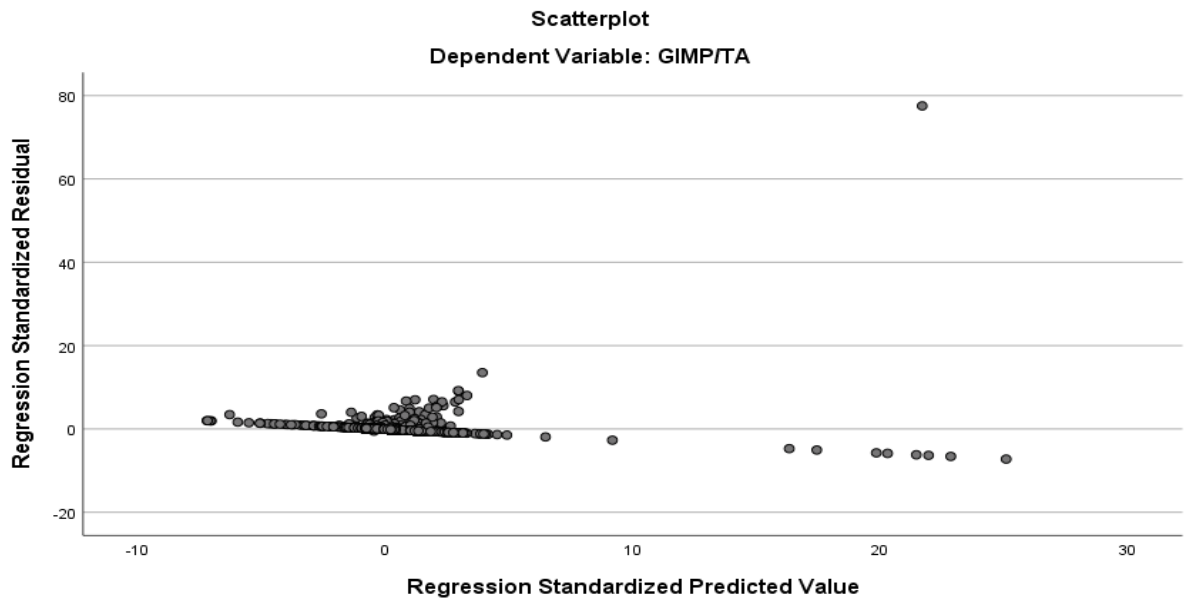
7	Switzerland	Materials	Deputy Head of Consolidation and Reporting	Full responsibility for preparing and executing the impairment test including determination of WACC.

Appendix 4: Collinearity Diagnostics of OLS Regression (SPSS Output)

Coefficients							
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0,000	0,003		0,170	0,865		
GDP	0,007	0,018	0,006	0,367	0,714	0,418	2,393
FIRM SIZE	0,000	0,000	-0,015	-1,099	0,272	0,586	1,708
ROA	0,083	0,003	0,285	24,328	0,000	0,847	1,180
LEVERAGE	1,712E-08	0,000	0,004	0,379	0,705	0,994	1,006
GOODWILL	0,008	0,003	0,037	3,208	0,001	0,879	1,137
ΔOCF	2,887E-06	0,000	0,003	0,272	0,786	0,996	1,004
ΔSALES	0,000	0,000	-0,009	-0,791	0,429	0,996	1,004
BIGBATH	0,013	0,001	0,115	9,623	0,000	0,810	1,235
BOARDIDP_AUD	-9,126E-06	0,000	-0,016	-1,155	0,248	0,626	1,597
BOARD-MEETINGS	0,000	0,000	0,043	2,922	0,003	0,526	1,899
% WOMEN	-3,424E-05	0,000	-0,016	-1,067	0,286	0,546	1,831
CEO TENURE	-9,694E-05	0,000	-0,014	-1,138	0,255	0,746	1,341
CEO	-1,963E-05	0,000	-0,004	-0,341	0,733	0,963	1,038
SHARE	-0,002	0,002	-0,017	-1,194	0,232	0,604	1,657

Industry IT	-0,002	0,002	-0,017	-1,290	0,197	0,697	1,434
Industry Consumer Staples	-0,002	0,002	-0,019	-1,454	0,146	0,648	1,543
Industry Health Care	-0,001	0,002	-0,003	-0,240	0,810	0,757	1,321
Industry Energy	-0,002	0,002	-0,018	-1,404	0,160	0,697	1,436
Industry Communication Services	-0,002	0,002	-0,018	-1,367	0,172	0,673	1,486
Industry Materials	0,001	0,002	0,005	0,438	0,662	0,743	1,346
Industry Utilities	-0,001	0,001	-0,020	-1,778	0,075	0,944	1,059
SMOOTH	-0,005	0,002	-0,042	-2,125	0,034	0,296	3,377
Year2011	-0,006	0,002	-0,047	-2,694	0,007	0,381	2,623
Year2012	-0,005	0,002	-0,040	-2,143	0,032	0,331	3,022
Year2013	-0,005	0,002	-0,041	-2,297	0,022	0,360	2,775
Year2014	-0,005	0,002	-0,041	-2,253	0,024	0,355	2,814
Year2015	-0,005	0,002	-0,044	-2,163	0,031	0,284	3,516
Year2016	-0,005	0,002	-0,044	-2,193	0,028	0,286	3,495
Year2017	-0,006	0,002	-0,051	-2,583	0,010	0,295	3,390
Year2018	-0,004	0,002	-0,034	-1,823	0,068	0,330	3,035
Year2019	-0,001	0,001	-0,012	-0,760	0,447	0,480	2,082
Industry Industrials							

Appendix 5: Scatterplot of residuals of OLS Regression (H3)



Appendix 6: White's Test for Heteroskedasticity (Model 2)

White's test for Ho: homoskedasticity

against Ha: unrestricted heteroskedasticity

chi2(471) = 6586.21

Prob > chi2 = 0.0000

Appendix 7a: Multivariate Tobit Regression results (Model 1) in 2020

2020 (Unstable Year)

VARIABLES	GIMPTA	GIMPTA	GIMPTAt-1
Constant	-0.415***	-0.415***	-0.312***
	(0.0446)	(0.0797)	(0.0337)
BIGBATH	0.0782***	0.0782***	0.0591***
	(0.0191)	(0.0207)	(0.0144)
BTM	-0.00133	-0.00133**	-0.00103
	(0.00132)	(0.000630)	(0.00101)
ΔSALES	-0.275***	-0.275***	-0.205***
	(0.0496)	(0.0717)	(0.0374)
ΔOCF	0.000529	0.000529	0.000391
	(0.000723)	(0.000563)	(0.000547)
ROA	0.980***	0.980***	0.733***
	(0.0418)	(0.184)	(0.0316)
SMOOTH	0.00695	0.00695	0.00463
	(0.0146)	(0.0138)	(0.0110)
LEVERAGE	-0.000157	-0.000157	-0.000117
	(0.000196)	(0.000206)	(0.000148)
CEOTENURE	0.000781	0.000781	0.000587
	(0.00120)	(0.00111)	(0.000909)
CEOSHARE	-0.000793	-0.000793	-0.000644
	(0.00287)	(0.00254)	(0.00217)
WOMEN	0.000301	0.000301	0.000213
	(0.000561)	(0.000558)	(0.000423)
BOARDIDP_AUD	-0.000342	-0.000342*	-0.000250

	(0.000226)	(0.000205)	(0.000170)
BOARDMEETINGS	0.00236*	0.00236*	0.00175*
	(0.00141)	(0.00124)	(0.00106)
FIRMSIZE	0.0201***	0.0201***	0.0152***
	(0.00423)	(0.00590)	(0.00319)
GOODWILL	0.0449	0.0449	0.0354
	(0.0463)	(0.0437)	(0.0349)
GDP	-0.110	-0.110	-0.0884
	(0.246)	(0.228)	(0.186)
Industry Controls	Yes	Yes	Yes
Year Controls	Yes	Yes	Yes
Robust Standard Errors	No	Yes	No
Observations	750	750	750

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 7b: Multivariate Tobit Regression results (Model 1) in 2010-2019

2010-2019 (More stable years)

VARIABLES	GIMPTA	GIMPTA	GIMPTAt-1
Constant	-0.102***	-0.102***	-0.0938***
	(0.00643)	(0.00972)	(0.00592)
BigBathDummy1	0.0269***	0.0269***	0.0236***
	(0.00303)	(0.00445)	(0.00279)
BTM	-3.32e-05	-3.32e-05	-3.29e-05
	(8.99e-05)	(6.74e-05)	(8.26e-05)
CSALES	-0.000365	-0.000365	-0.000280

	(0.000631)	(0.000437)	(0.000603)
COCF	4.61e-05	4.61e-05	4.03e-05
	(7.09e-05)	(6.65e-05)	(6.50e-05)
ROA	0.0263***	0.0263***	0.0233***
	(0.00705)	(0.0100)	(0.00651)
SMOOTH	0.000778	0.000778	0.00100
	(0.00187)	(0.00186)	(0.00172)
LEVERAGE	1.20e-07	1.20e-07**	1.13e-07
	(7.50e-08)	(5.90e-08)	(6.88e-08)
CEOTENURE	0.000179	0.000179	0.000148
	(0.000194)	(0.000175)	(0.000179)
CEOSHARE	-0.000258	-0.000258	-0.000243
	(0.000267)	(0.000243)	(0.000249)
WOMEN	-8.32e-05	-8.32e-05	-7.23e-05
	(7.68e-05)	(7.13e-05)	(7.05e-05)
BOARDIDP_AUD	6.51e-05**	6.51e-05**	5.88e-05**
	(2.61e-05)	(2.70e-05)	(2.40e-05)
BOARDMEETINGS	0.000182	0.000182	0.000226
	(0.000205)	(0.000214)	(0.000188)
FIRMSIZE	0.00385***	0.00385***	0.00351***
	(0.000553)	(0.000603)	(0.000508)
GOODWILLASSETS	0.0227***	0.0227***	0.0209***
	(0.00629)	(0.00646)	(0.00578)
GDP	-0.0559	-0.0559	-0.0532
	(0.0451)	(0.0376)	(0.0415)
Industry Controls	Yes	Yes	Yes
Year Controls	Yes	Yes	Yes

Robust Standard Errors	No	Yes	No
Observations	6,681	6,681	6,680

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 8: OLS Regression of Economic Impairment Factors on Goodwill Impairment scaled by total assets at the end of the year including the whole sample (2010-2020)

VARIABLES	GIMPTA	GIMPTA
Constant	-0.00268	-0.00268
	(0.00229)	(0.00613)
BTM	1.49e-05	1.49e-05
	(5.36e-05)	(2.39e-05)
CSALES	-0.000309	-0.000309
	(0.000326)	(0.000353)
COCF	-9.31e-07	-9.31e-07
	(1.09e-05)	(1.64e-06)
ROA	0.0713***	0.0713
	(0.00336)	(0.0701)
FIRMSIZE	-0.000450**	-0.000450
	(0.000214)	(0.000349)
GOODWILL	0.00563**	0.00563**
	(0.00280)	(0.00287)
GDP	-0.00111	-0.00111
	(0.0189)	(0.0111)
Industry Controls	Yes	Yes
Year Controls	Yes	Yes

Robust Standard Errors	No	Yes -Clustered at ISIN
Observations	7,431	7,431
R-squared	0.061	0.061

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1