

**THE VALUE RELEVANCE OF GOODWILL AND
ITS DISCLOSURE FOR COMPANIES
LISTED ON THE JSE**

by

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ABSTRACT

The value relevance of goodwill is a topic of ongoing discussion in accounting, because of the nature of this intangible asset, and changes in the accounting standards regarding the disclosure of goodwill and goodwill impairment. *International Financial Reporting Standard (IFRS) 3* was implemented in March 2004 with the aim of improving the reliability of goodwill accounting, introducing a major change, namely the requirement to test annually for goodwill impairment.

The aim of this study was to determine the value relevance of goodwill after the introduction of *IFRS 3* in a specific setting, namely South Africa, using JSE-listed firms as a sample. It also investigated the determinants for both goodwill impairment decisions and the disclosure quality of goodwill impairments, as well as the value relevance of goodwill impairment and its disclosure. Finally, the study considered the explanation strategies used by management to provide reasons for goodwill impairment. Panel least squares regressions and a cluster analysis were used to analyse JSE-listed firms for the period from 2006 to 2017.

The findings show that goodwill is indeed value relevant. Significant predictors of goodwill impairment were found to be potential earnings management, whether a firm was goodwill intensive, and corporate governance mechanisms. Goodwill impairment in itself was not value relevant, but it was a predictor of market value when its disclosure was taken into account. Findings indicated that goodwill impairment test-related disclosure was negatively associated with a firm's market value. Firms that provided an excuse for impairing goodwill, without taking responsibility for that impairment, tended to have higher quality of disclosure than firms that did not provide any reason for goodwill impairment at all.

The study contributes to the existing literature by presenting evidence that goodwill is value relevant in the South African setting after the introduction of *IFRS 3*, and that when investors determine a firm's market value, investors simultaneously assess goodwill impairment and its disclosure. How reasons for impairment are provided by management also provides insight into the quality of goodwill impairment disclosure.

KEY WORDS:

determinants of goodwill impairment

explanatory strategies for goodwill impairment

goodwill

goodwill impairment

IAS 36

IFRS 3

JSE-listed firms

quality of goodwill impairment disclosure

value relevance

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LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Meaning
AASB	Australian Accounting Standards Board
BIC	Bayesian information criterion
CAPM	Capital asset pricing model
CEO	Chief executive officer
CGU	Cash generating unit
EGLS	Estimated generalised least squares
FASB	Financial Accounting Standards Board
GAAP	Generally accepted accounting principles
IAS	International Accounting Standard(s)
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standard(s)
JSE	Johannesburg Stock Exchange
MTB	Market-to-book (value)
OLS	Ordinary least squares
PCSE	Panel-corrected standard errors
R&D	Research and development
VIF	Variance inflation factor
WACC	Weighted average cost of capital
SFAS	Statement of Financial Accounting Standards
SUR	Seemingly unrelated regressions
ZAR	South African Rand

LIST OF DEFINITIONS

Cash generating unit	This is the smallest identifiable group of assets that generates cash inflows. These cash flows are largely independent of cash flows from other assets, or groups of assets.
Fair value	This is the price that would be received to sell an asset, or paid to transfer a liability in an orderly transaction between willing market participants on a specific date.
Impairment	This refers to a reduction in value of a firm's asset to below its carrying value.
Goodwill	Goodwill originates with the acquisition of an investment or target firm where the purchase price was greater than the implied fair value.
Recoverable amount	This is the higher value of fair value less costs to sell and value in use.
Value in use	This is the present value of future cash flows expected to be derived from a cash-generating unit.

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Goodwill is an intangible asset that originates with the acquisition of an investment or target firm in a friendly takeover, where the purchase price is greater than the implied fair value. The value relevance of goodwill has become a topic of ongoing debate in the financial literature, because of numerous changes in the accounting treatment of this asset class over the years. The latest change in 2004 was based on the assumption that impairment charges reflect the underlying economic attributes of goodwill better than systematic amortisation charges could. It is widely admitted that the recognition and measurement of intangible assets, such as goodwill, are more complex than those of tangible assets. According to the International Financial Reporting Standards (IFRS), developed by the International Accounting Standards Board (IASB),¹ an entity should consider several aspects before recognising an intangible asset. It needs to decide, firstly, whether the asset can be identified separately; secondly, whether it is under the control of the entity and, lastly, whether there are any relevant aspects regarding the existence of future economic benefits from the asset.

Reported intangible assets can consist of (but are not limited to) goodwill, intellectual property, patents and trademarks, and their disclosure is regulated by the accounting standards, compiled in the United States by the Financial Accounting Standards Board (FASB), and by the IASB. In 2001, the United States Generally Accepted Accounting Principles (US GAAP) *Statement of Financial Accounting Standards (SFAS) no. 142: Goodwill and other intangible assets* was amended (FASB, 2001). This revision of the SFAS was regarded as an extremely controversial mandatory accounting change (Lee & Yoon, 2012). The revision entails that goodwill may no longer be amortised, but is now subject to annual impairment testing. The FASB argued that it is impossible to predict the useful life of goodwill accurately, and that therefore it cannot be amortised

¹ Until 2001, known as the International Accounting Standards Committee (IASC).

over time, because of the possibility that goodwill is finite (FASB, 2001). In 2004, the IASB followed suit by implementing *IFRS 3: Business combinations* (IASB, 2004a) and the *International Accounting Standard (IAS) 36: Impairment of assets* in 2004 (IASB, 2004b).

Goodwill impairment testing involves comparing the fair value of the reporting unit (the investment) to its carrying amount. The fair value calculation requires the estimate of future cash flows that the particular investment will generate, and a suitable discount rate to calculate the present value of this investment. There is some room for this calculation to be manipulated, because it is based on management's expectations of future cash flows and perception or estimation of a suitable discount rate. The risk of such manipulation may or may not have an effect on how investors value any reported goodwill – a study by Whitwell, Lukas, and Hill (2007) found that stock analysts fail to value intangible assets, demonstrating a limited understanding of what intangible assets entail. Subsequent to the adoption of *IFRS 3*, comprehending intangible assets may have become even more difficult for market participants as a result of the fair value accounting regime. It seems inevitable that the valuation of goodwill has changed after the adoption of *IFRS 3*.

One of the general aims of the IASB is to ensure that reported accounting amounts are relevant and reliable. An accounting amount is relevant if it is capable of making a difference in financial statement users' decisions; it is reliable if it represents what it purports to represent (Barth, Beaver, & Landsman, 2001). Bens, Heltzer, and Segal (2011) argue that even though fair value methods capture relevant accounting information, they are difficult to implement and can in fact reduce the information content of accounting reports, with resulting knock-on effects for other users of financial statements. The adoption of the various IFRS have led to significantly greater consistency in accounting recognition and measurement, as well as improved disclosure of the information captured in the financial statements, but the burden of compliance is substantial (Amiraslani, Iatridis, & Pope, 2013). In particular, it takes a significant amount of effort from companies to meet the disclosure requirements regarding goodwill determined by *IFRS 3* and *IAS 36*. This compliance burden in respect of the reporting of goodwill prompted the decision to undertake the research reported in this thesis on the possible influences that the disclosed goodwill amount

may or may not have had on fluctuations in the market values of companies since the introduction of *IFRS 3* and *IAS 36*. The findings could be of value to investors, market analysts and, most importantly, shareholders.

Value relevance studies are aimed at determining whether financial reporting provides users of financial statements with relevant information that enables them to estimate company value. A number of studies have already investigated changes in the value relevance of goodwill reporting, both prior to and since the adoption of *IFRS 3* in 2004, notably Bens *et al.* (2011), Eloff and De Villiers (2015), Hamberg and Beisland (2014) and Ji and Lu (2014), with contradictory results. Eloff and De Villiers (2015) have presented evidence that after the implementation of annual goodwill impairment testing required by *IFRS 3*, there was a stronger positive association between companies' share price and goodwill, which suggests that the reporting of goodwill had become more value relevant. Ji and Lu (2014) found that value relevance was higher for firms which provided more reliable information on intangible assets, such as more comprehensive details on subsequent impairments of goodwill. Hamberg and Beisland's (2014) study suggests that goodwill amortisations were not significantly related to share returns for a sample period prior to the adoption of *IFRS 3*, but that impairments reported during the same sample period were related to share returns. By contrast, their findings regarding the period after the adoption of *IFRS 3* suggested that impairments were no longer significantly related to share returns, and therefore were not value relevant. Thus, after many years of research focusing on goodwill, the question of whether *IFRS 3* has changed the usefulness of reported goodwill and its disclosure to the users of financial statements appears to remain unresolved.

According to the IASB (2004a), the purpose of implementing *IFRS 3* was to promote the convergence of accounting standards and to improve the relevance, reliability and comparability of information surrounding accounting for business combinations. The implementation has, however, been criticized because of the managerial discretion inherent in goodwill impairment testing and the reporting on the outcomes of such testing (Watson & Lhaopadchan, 2010). Carlin and Finch (2010) found evidence that large entities in Australia and New Zealand used lower than expected discount rates in order to avoid unwanted impairment losses. This finding suggests that the recognition of impairment losses may be flawed as a result of management's attempts

to avoid such losses. Another study that highlights a flaw in the assumptions underlying the intended aim in implementing *IFRS 3* was done by Hayn and Hughes (2006). They found that the reported information from acquisitions does not provide users with enough information to predict future goodwill impairments accurately, and that goodwill impairments lag behind the economic impairment of goodwill by an average of three to four years.

There is some evidence that where firms have reported impairment losses, this has had an influence on firm value, suggesting that the information content contained in the reasons reported for goodwill impairments is value relevant (Bostwick, Krieger, & Lambert, 2016). Bostwick *et al.* (2016) therefore suggest that investors and analysts who are particularly interested in future cash flows should consider goodwill impairment information separately. It is possible to do so because *IFRS 3* requires management to report the particular methods used to calculate goodwill impairment and document the reasons for the goodwill impairments that are recognised. Andreicovici, Jeny, and Lui (2020) found that, in their decision-making, analysts use information on both the goodwill impairment tests disclosed and the impairment amount. However, Andreicovici *et al.* (2020) also show that the application of the impairment tests results in different levels of quality of disclosure, which can in turn result in disagreement in the capital market. Logically, a higher level of disclosure is beneficial for analysts, but the same accounting standard can result in variations in disclosure transparency, which could affect the level of information asymmetry (Andreicovici *et al.*, 2020). An accounting standard such as *IAS 36*, which allows substantial management discretion, can only be effective if the requirements are applied correctly.

There are several reasons why firms' goodwill may be impaired, and this aspect has also been explored in the literature. According to Gu and Lev (2011), as well as Zining, Shroff, Venkataraman, and Zhang (2011), goodwill impairment may arise as a result of initial overpayment of the target firms. Zining *et al.* (2011) also argue that impairment may result from subsequent negative events. Bond, Govendir, and Wells (2016) and Watson and Lhaopadchan (2010) question whether managerial self-interest and earnings management concerns may lead to such impairments. AbuGhazaleh, Al-Hares, and Roberts (2011) show that goodwill impairments may be strongly

associated with effective governance mechanisms, indicating that managers use explanations of these impairments to convey private information and expectations about the underlying performance of the particular firm. Based on these prior studies, it is clear that users of financial statements should be mindful of the underlying reasons and the explanations offered for goodwill impairments. It seems that this phenomenon should be explored further.

Based on the literature on goodwill impairment, South Africa was considered as a possible setting for investigating the value relevance of goodwill and of goodwill impairments. South Africa is ranked amongst the top 60 competitive countries, according to the World Economic Forum (2019), suggesting a strong institutional environment. Furthermore, the Johannesburg Stock Exchange (JSE) is the largest stock exchange in Africa and 19th largest in the world (JSE, 2017). Since 2001, South African firms have been required to produce integrated reports, as opposed to the sustainability reports that they presented prior to that. Clayton, Rogerson, and Rampedi (2015) identified a number of trends in the annual reports of South African firms: firstly, they provided assurance of non-financial information; secondly, there was comparable adherence to external guidelines, and thirdly, there was a clear evolution of stakeholder-oriented disclosure. The importance of the JSE and the institutional environment regulating financial reporting make South Africa an ideal setting for investigating the effects of goodwill, goodwill impairments and its disclosure on the value of a firm.

1.2 RESEARCH PROBLEM

It is evident from previous studies that there are a number of aspects of goodwill and its impairment that could influence firm value. Five areas in particular can be researched. The first is determining whether goodwill influences firm value. The second is identifying the determinants of goodwill impairment decisions. The third is investigating the determinants of the quality of disclosure of goodwill impairments. The fourth is ascertaining whether goodwill impairment and its disclosure have an impact on the market value of a firm. The fifth is ascertaining whether there are differences in how goodwill impairment is explained (which has an effect on the quality of goodwill impairment disclosure), and whether this differs between industries.

Previous research has investigated the influence of the most recent changes in the accounting of goodwill stemming from the adoption of *IFRS 3*. Some studies indicate that goodwill reporting has become more value relevant since *IFRS 3* was introduced (Chalmers, Clinch, Godfrey, & Wei, 2012; Kimbro & Xu, 2016). However, a number of studies focusing on the information content of goodwill reporting failed to support the claim that such reporting has become more value relevant since the adoption of *IFRS 3* (Bens *et al.*, 2011; Hamberg & Beisland, 2014; Hayn & Hughes, 2006). This finding may be a result of a perception among analysts and other users of financial records that managers can manipulate the reported value of goodwill, as Carlin and Finch (2010) have shown. Their findings, based on data from Australia and New Zealand, suggest that management uses opportunistic discount rates in determining the fair value of goodwill. Closer to home, a recent South African study by Day (2020) investigated the use of discount rates by South African firms, as prescribed by *IAS 36*. It was found that there was low compliance with the discount rate disclosure requirement, and with the requirement to provide meaningful information on the assumptions underpinning the future cash flows used.

In the debate around goodwill reporting and the implication of the requirements of *IFRS 3*, some evidence has been presented of the value of the information content embedded in the reporting of goodwill impairments (Bens *et al.*, 2011; Ji & Lu, 2014). The adoption of *SFAS no. 142* in 2001 and *IFRS 3* in 2004 was a central theme in most of the studies discussed above, and deserves further study in the relatively understudied South African context, which, as indicated above, is in fact a suitable setting in which to explore this topic. The sample of the present study therefore included JSE-listed firms which reported goodwill for one or more years in the period from 2006 to 2017. The period under review commenced two years after the adoption of *IFRS 3* and *IAS 36*, and it was chosen to ensure that by the start of the period under review, firms' management and accounting officers were already accustomed to the requirements of *IFRS*, and that poor disclosure cannot be ascribed to the newness of the adoption of the applicable accounting standard.

According to the requirements of *IAS 36*, firms are required to disclose the reasons for any goodwill impairments that are recorded. Hayn and Hughes (2006) suggest that the ability to predict goodwill impairment based on information provided in the financial

reports is limited, but this problem could be resolved by more detailed and timely segmental reporting. This finding is evaluated in the present study by comparing predictors of goodwill impairment to the actual reasons disclosed by management.

Most South African firms listed on the JSE comply with integrated reporting (Du Toit, 2017), and, according to Clayton *et al.* (2015), it is likely that these firms have high quality non-financial information available, and that their disclosure of financial and non-financial information is shareholder-oriented. For the present study, this could mean that details disclosed with regard to goodwill impairments are more reliable and relevant than might be found in other countries studied in the previous studies done internationally.

Most of the previous studies have been conducted on data from First World countries, in high-income economies. The South African economy is ranked as a middle-income, or a developing, economy by the World Bank (2017). The information conveyed in firms operating in a middle-income economy, such as that in South Africa, should differ from the information disclosed by a similar firm operating in a First World economy, particularly regarding goodwill and its subsequent impairment, which depends on the future cash flows from the investment and the application of an appropriate discount rate. Variables such as future cash flows and an appropriate discount rate can be subject to a greater extent of uncertainty in a middle-income economy. Hence it is important to consider the country from which a sample is drawn, as its economic status has an effect on the prediction of these variables. As far as could be ascertained, few studies have been conducted to investigate the information content of goodwill impairments in various industries in a developing economy, and specifically in South Africa.

The previous literature on goodwill seems to focus either on changes in the accounting setting, or on the causes of the impairment of goodwill. The present study seeks to determine the value relevance of the disclosure of goodwill and of goodwill impairments. The study period chosen falls after the adoption of *IAS 36*, because the accounting treatment of goodwill and goodwill impairment is very different after the introduction of *IAS 36*, compared to prior to its introduction. Throughout the data span of the present study, goodwill has been subject to annual impairment testing as required by *IAS 36*. The fact that a firm's goodwill value could change annually

provides a valuable research opportunity to gain insight into the value relevance of the disclosure of goodwill and its impairments. To meet *IAS 36*'s requirements, firms must provide disclosure surrounding the variables used to determine the amount of impairment, as well as information on the reasons for the impairment. However, according to Andreicovici *et al.* (2020), there are inconsistencies in the application of the requirement in *IAS 36*, which could create uncertainty among economic analysts. The present study therefore investigates whether goodwill impairment test-related disclosure has an effect on the market value of an enterprise.

1.3 RESEARCH AIMS AND OBJECTIVES

The aims of the research, based on the research problem, are set out below. The study seeks to determine whether goodwill, goodwill impairment and its disclosure of impairments (as accounted for in terms of *IAS 36*) of South African firms is value relevant. Furthermore, it seeks to establish the determinants of goodwill impairment and those of quality of disclosure, and whether the quality depends on the explanation for the goodwill impairment offered by management and the industry the firm operates in.

The research objectives for the study are the following:

- to determine the impact of goodwill on firm value and whether it is relevant in the decision-making of South African equity investors in years following the adoption of *IFRS 3*, using data from 2006 to 2017;
- to investigate plausible reasons for goodwill impairment identified in the literature, and explore why South African firms impair their goodwill;
- to identify the determinants of goodwill impairment quality disclosure;
- to ascertain whether the goodwill impairment and its disclosure are value relevant; and
- to determine whether the quality of disclosure can be predicted based on ways in which reasons are provided for goodwill impairment by management, by scrutinising annual reports to identify the reasons/explanations reported for these impairments, and by ascertaining whether the quality of disclosure differs between industries.

1.4 CONTRIBUTION OF THE STUDY

The study is intended to shed light on the value relevance of goodwill, its subsequent impairment and the disclosure of these on firm value in the period since the adoption of *IFRS 3*. The effect of the goodwill impairment test-related disclosure could provide insight for standard setters into how well the standard is being implemented. Managers, analysts and shareholders can use the results of this study in various ways to comprehend the value relevance of goodwill, subsequent impairments and its disclosure better.

The data used in this study were obtained from South African companies, because research on these data can make a substantial contribution to an understanding of the value relevance of elements in the accounting setting of an emerging economy. Given the high level of corporate governance in the South African financial reporting setting, the value of the disclosure of reliable and relevant information can be quantified.

1.5 DELIMITATIONS

Only non-financial firms listed on the JSE for 12 years, from 2006 to 2017, were included in the sample. The financial industry sector was excluded because it is a regulated sector with different reporting standards and requirements from those in other sectors.

Data were obtained from IRESS, a reliable supplier of South African financial data. It was assumed that the financial statements were a true reflection of a firm's financial position on the reporting date. Information in the disclosure of goodwill impairments were sourced from companies' financial statements. The findings are therefore country- and period-specific and cannot be freely generalised to other settings.

1.6 OUTLINE OF THE STUDY

The remainder of this study is set out as follows:

- In Chapters 2 and 3, the findings of prior research are discussed, the theoretical basis for the study is developed and hypotheses are formulated.
- In Chapter 4, the research methodology is set out, together with the sampling methodology and the final sample numbers.

- Chapters 5 to 8 discuss the findings for each of the hypotheses.
- Chapter 9 contains the summary and conclusions of this study.

1.7 SUMMARY AND CONCLUSION

This introductory chapter has explained the background to the study, and the research problem. The research aims emanating from the research problem, and the research objectives have been specified, along with the intended contribution of the study, as well as its delimitations. An outline of the study has also been provided to guide readers on the structure of the study.

The main purpose of this study is to determine whether users of financial statements regard goodwill, its subsequent impairments, and the disclosure of goodwill and its impairments as an incremental measurement base to predict equity-accounted carrying amounts. In addition, the study investigates the potential explanations given for goodwill impairment and the determinants of the quality of goodwill impairment disclosure. Furthermore, differences between the different industries in respect of the quality of goodwill impairment disclosure and the ways in which reasons are provided for goodwill impairment are examined. The study adds to the existing literature by considering the effect of goodwill and its subsequent impairments on firm value in a setting after the introduction of *IFRS 3*.

CHAPTER 2: GOODWILL AND ITS IMPAIRMENT

2.1 INTRODUCTION

As indicated in Chapter 1, goodwill represents the difference between what an acquiring firm pays for a target firm during an acquisition and the book value of the target firm (Sherrill, 2016). Goodwill exists if the purchase of a target firm is greater than the net asset value of that target firm. Therefore, goodwill depends on the purchase price agreed upon between the acquirer and the target firm. From its very inception, the valuation of goodwill can be complex, and is subject to a level of managerial discretion and sometimes even management manipulation (Bauer, O'Brien, & Saeed, 2014).

The accounting standards on goodwill assume that a rational party would not overpay for a business, although rational parties often do so (Erickson, Wang, & Zhang, 2012). Moreover, although the value of goodwill is related to the future, the accounting approach followed is based on past information (Jerman & Manzin, 2008). Because goodwill is classified as an intangible asset, goodwill's recognition and reporting can be complex because of the nature of this particular asset class. Intangible assets are assets without physical form and their valuation has long been described as challenging (Horton & Serafeim, 2010). In a South African context, goodwill is considered a material intangible asset, and a study by Day (2020) has shown that the diligence with which firms provide the impairment testing disclosures is important for the reliability of financial reporting. For the sampled firms in his study, Day (2020) found that goodwill represents on average 7.9% of the firms' total assets.

The biggest corporate crash in South African history to date is that of Steinhoff International (Styan, 2018). According to Styan (2018), one of the clear warning signs that was overlooked by investors and other stakeholders was the large number of intangible assets listed in Steinhoff International's Statement of Financial Position. In particular, in the 2016 book year, the company's intangible assets amounted to €17,7 billion, almost double the previous year's €9,5 billion (Styan, 2018). These intangible assets consisted mainly of goodwill and brand names. The large goodwill balance that was recorded indicated that management had overpaid for target firms. If investors

analysed this statement of the company's financial position overall without paying close attention to what the total assets consisted of, they may have overlooked such warning signs. According to Whitwell *et al.* (2007), investors often do not fully understand intangible assets, and often exclude them when they try to determine firm value. Therefore it seems reasonable that even a large value of goodwill may be overlooked if investors do not fully comprehend intangible assets and disregard it in their decision-making.

Over the years, various changes have been made to the accounting standards applying to goodwill, with the aim of improving the transparency, reliability and relevance of goodwill accounting. If the accounting standards can guide preparers of the financial statements to improve the quality and reliability of accounting information, it should become easier for investors to use goodwill in their firm valuations. Russell (2017) has shown that after the implementation of *IFRS 3*, intangible asset recognition has become more concurrent with share prices for Australian firms. Furthermore, the association between goodwill and economic benefits strengthened following *IFRS 3*. Russell (2017) is therefore of the opinion that the usefulness of goodwill information has improved since the adoption of *IFRS 3*.

Before the adoption of *IFRS 3*, goodwill was amortised over its supposed useful life. However, according to the IASB (2020), goodwill and related intangible assets are deemed to have indefinite useful lives and can therefore not be amortised over time. The reporting standards were therefore amended to replace systematic amortisation with annual impairment testing of recognised goodwill. According to the IASB (2020), this change was introduced to improve the financial reporting of goodwill and other intangible assets to reflect the underlying economic benefits of those assets better. A relevant study in this regard was conducted by Wyatt (2005), who examined the extent to which management makes accounting choices to record intangible assets based on the underlying economic factors. The results showed that the intangible assets for which management has the highest accounting discretion are highly correlated with the underlying economic factors, more so than with goodwill and research and development (R&D) (Wyatt, 2005). This suggests that concerns that greater accounting discretion may lead to widespread manipulation of the accounting information is overstated.

The remainder of the chapter explores changes in the accounting for goodwill in the last decade. The latest accounting standards governing goodwill are discussed, with specific reference to the differences between US GAAP and the IFRS. The disclosure requirements set out in *IAS 36* are investigated, because this standard provides the most recent implemented guidance on how goodwill impairments should be accounted for. The literature on the impairment of goodwill is also considered with specific reference to the information content embedded in the reporting of goodwill impairment and the underlying reasons for impairing goodwill. The chapter concludes with an investigation of goodwill impairment disclosure and potential future changes to the accounting of goodwill.

2.2 THE ACCOUNTING TREATMENT OF GOODWILL

The accounting treatment of goodwill is one of the most hotly debated and controversial topics in the accounting discipline (Bugeja & Gallery, 2006; Eloff & De Villiers, 2015). The outcomes of some of these debates is evident in the ongoing adoption of new accounting standards and further amendments to these standards over the years – Higson (1998) has noted changes to goodwill practices as far back as the 1980s. The IASB is in ongoing discussions with all stakeholders to ensure that the information regarding goodwill provided to users of financial statements is useful, relevant and effective. In a recent discussion paper, the IASB (2020) explores changes in how a company is required to account for goodwill at the acquisition date, with the purpose of assisting investors in holding companies accountable for acquisitions and improving the overall accounting for goodwill.

2.2.1 AC 131 and IAS 22

In South Africa, the first definite guidelines on the accounting treatment of goodwill were issued in June 1999 in the South African *Statement of GAAP (AC) 131: Business Combinations* (SAICA, 2018).² *AC 131* was based on *IAS 22: Business Combinations* (IASB, 1998), which came into effect for all periods commencing on or after 1 January 2000. According to *AC 131* and *IAS 22*, entities were allowed to account for business combinations by means of two alternative methods, namely the pooling of interest

² *IAS 22* is a replica of *AC 131* and has a dual numbering system to refer to both the IFRS and the statement of GAAP numbers.

method or the purchase method. With the pooling of interest method, assets and liabilities are accounted for at their historical values; therefore, no goodwill was recorded. With the purchase method, the market values of assets and liabilities were used to account for them in the financial records at the time of acquisition. Any excess paid above the fair value(s) was recorded as goodwill, and was subject to annual amortisation.

According to *AC 131* and *IAS 22*, there were also two options regarding how users could apply the purchase method. The first was to measure the identifiable assets acquired and liabilities assumed at the acquisition date by using a benchmark treatment. Under the benchmark treatment, assets and liabilities were measured at the aggregate of the fair value of the identifiable assets and liabilities acquired to the extent of the acquirer's interest obtained, and the minority's proportion of the pre-acquisition carrying amounts of the assets and liabilities. The second was an alternative treatment which entailed measuring identifiable assets acquired and liabilities assumed at their fair values at the acquisition date.

Allowing users to account for goodwill in dissimilar ways reduces the reliability and comparability of the financial information provided, and thereby reduces the value-relevance of goodwill (Eloff & De Villiers, 2015). The IASB recognised this weakness, amongst others, and decided to review *IAS 22* in 2001, ultimately replacing it in 2004 with a new standard, *IFRS 3: Business combinations* (IASB, 2004a). A number of differences between *IAS 22* and *IFRS 3* thus changed the nature of goodwill accounting. The main differences between *IAS 22* and *IFRS 3* are discussed below.

2.2.1.1 Initial accounting of business combinations

In terms of *IAS 22*, users were allowed to account for a business combination at acquisition date by using the pooling of interest method or the purchase method. In terms of *IFRS 3*, only the purchase method may be used, but the identifiable assets and liabilities assumed must be initially measured at their fair value, as in the alternative method prescribed by *IAS 22*. If the purchase price exceeds the recognised fair value, goodwill is recognised.

2.2.1.2 Subsequent measurement of goodwill

The FASB argues that it is impossible to predict the useful life of goodwill accurately. Hence, it cannot be amortised over time, because of the possibility that goodwill may be finite (FASB, 2001). The FASB also notes that financial statement users in the United States indicated that they did not regard goodwill amortisation as useful information. Financial statement users were therefore likely to ignore goodwill amortisation in calculating ratios (Wiese, 2005). It was therefore decided that under *IFRS 3*, goodwill should no longer be amortised over its useful life, but should rather be subject to annual impairment testing, or even more often, if there are indicators of impairment.

2.2.1.3 Accounting for liabilities

Under *IAS 22*, contingent liabilities were ignored. Under *IFRS 3*, a particular liability can only be allocated to the business combination if the liability for terminating the activities of the acquiree exists at the acquisition date. For contingent liabilities, it may only be allocated if the fair values can be measured accurately.

2.2.1.4 Probability recognition criterion for recognising intangible assets

The probability recognition criterion refers to the probability of future economic benefits based on reasonable and supported assumptions regarding the conditions surrounding the life of an asset. There is no probability recognition criterion for recognising intangible assets in *IFRS 3*, unlike in *IAS 22*.

2.2.1.5 Negative goodwill

In the event where the purchase price of a business combination is less than the assets acquired and liabilities assumed, *IAS 22* permitted users to recognise negative goodwill. However, according to *IFRS 3*, if this situation (also known as a bargain purchase) arises, the acquiring entity should immediately recognise a profit in the Statement of Comprehensive Income.

Based on the discussion above, there are substantial differences between *IAS 22* and *IFRS 3*. Therefore the introduction of a new accounting standard on business combinations was inevitable.

2.2.2 The adoption of *SFAS no. 142 (US GAAP)* and *IFRS 3*

During 2001, the FASB in the USA adopted *SFAS no. 142: Goodwill and other intangible assets* (FASB, 2001). The objective of *SFAS no. 142* was to remove overstated goodwill from firms' financial statements (Xu, Anandarajan, & Curatola, 2011). The IASB followed suit during March 2004, when it adopted *IFRS 3* to replace the previous accounting statement, *IAS 22*. The objective of the *IFRS 3* was to improve the international comparability of financial statements and improve transparency in the accounting of business combinations (Jerman & Manzin, 2008). A study by Lopes, Walker, and Da Silva (2016) shows that IFRS adoption led to an increase in the informativeness of accounting reports.

The recognition and measurement of goodwill is prescribed in *IFRS 3: Business combinations*. Goodwill must be recognised as the amount acquired on the acquisition date minus any goodwill impairments, as prescribed by *IAS 36, Impairment of assets*. *IAS 36* stipulates that goodwill needs to be allocated to a cash-generating unit (CGU), which can be defined as a unit that is expected to benefit from the synergies of the combination. For the purposes of impairment testing, goodwill is allocated to each of the acquirer's CGUs, but, according to Khairi, Laili and Tran (2012), one of the greatest challenges in adopting *IFRS 3* is the manner in which goodwill is allocated between CGUs. The CGUs need to be identified first, which could be difficult in cases where a firm has acquired another entity and the acquiree consisted of a number of separate divisions. If the allocation of goodwill to a CGU is incorrect, the subsequent impairment of goodwill will also be incorrect. It is therefore vital that the allocation of goodwill to the CGUs is done accurately (Khairi, Laili, & Tran, 2012). A CGU cannot be larger than an operating segment; therefore the number of CGUs should equal to or higher than the number of operating segments.

Bugeja and Loyeung (2015) examined the proportion of the purchase price allocated to goodwill during an acquisition, using data collected from mergers and acquisitions in Australia between 1998 and 2012. Of all these acquisitions, 42% of acquirers recorded a nil amount for goodwill. However, the findings suggest that the amount allocated to goodwill increased after Australia adopted *IFRS 3* (Bugeja & Loyeung, 2015).

Despite the fact that *IFRS 3* was developed to improve the relevance, reliability and comparability of financial information, the implementation of the standard may be a challenge. Masadeh, Mansour, and Al Salamat (2017) compared the implementation of *IFRS 3* in multiple geographical regions and found that *IFRS 3* was successfully adopted in mainly developed nations, whereas firms in developing countries may struggle to implement *IFRS 3* because of the high cost of compliance preparation and documentation (Masadeh, Mansour, & AL Salamat, 2017). Amiraslani *et al.* (2013) report that disclosure quality declines markedly when the cost and effort associated with compliance increases. It is, however, the aim of the IASB to issue standards that increase the comparability of financial reports produced by firms, regardless of their country of operation (Khairi *et al.*, 2012).

Vanza, Wells, and Wright (2018) argue that the new standard has the same problems as the prior standards relating to asset impairments and write-offs. They failed to find evidence that the new standard motivates managers to reduce uncertainty about future returns and or to disclose sufficient information regarding future performance. They also suggest that the IASB extend the disclosure requirements to firms where there are indicators of impairment generally (Vanza *et al.*, 2018). Findings such as these, criticising the implementation of fair value measurement, highlights the importance of determining whether there is an association between goodwill and firm value.

2.2.3 IFRS 3: Business combinations

Goodwill acquired through a business combination must be capitalised as an asset. *IFRS 3* sets out the principles and requirements of how an acquirer should recognise and measure the goodwill acquired during a business combination. In terms of *IFRS 3*, goodwill is defined as an asset representing any future economic benefit arising from a business combination that is not identified individually or recognised separately. *IFRS 3* provides guidelines on how the acquirer should apply the acquisition method when measuring goodwill. This includes the processes to determine the acquisition date and a description of the recognition and measurement criteria that should be applied.

According to paragraph 18 of *IFRS 3*, the acquirer should measure the identifiable assets and liabilities acquired at their fair values on the acquisition date (IASB, 2004a). In the event of a bargain purchase, where the purchase price was less than the net of the acquisition date amounts of the identifiable assets acquired and the liabilities assumed, the acquirer should recognise a gain. However, if the purchase price exceeds the net of the acquisition date value of the identifiable assets acquired and the liabilities assumed, it should recognise the difference as goodwill. Such an overpayment for a business combination is likely to occur if synergies and other benefits are expected to be derived from the acquisition, and is highly relevant to impairment testing (Day, 2020). Fair value accounting is therefore applied from the initial recognition of goodwill. This accounting continues in the subsequent measurements as governed by *IAS 36* if a firm elects to use fair value measurements to determine possible impairments.

In terms of *IFRS 3*, goodwill is subject to annual impairment testing, and is not amortised. The impairment loss is calculated based on the recoverable amount for the relevant CGU. The recoverable amount for each CGU is the higher of fair value less costs to sell (a market-based measure) and value in use (an entity-specific measure) (KPMG, 2014).

2.2.4 Fair value accounting

The IASB defines fair value as the price that would be received if an asset were to be sold, or the price that would be paid to settle a liability in orderly transactions between market participants (IASB, 2004a). *IFRS 3* is only one of the accounting standards required to use fair value accounting. Beatty and Weber (2006) caution that managers' bias may result in inappropriate fair value measurements and in misstatements of earnings and equity. For every accounting standard where fair value measurements are used, management needs to disclose the applicable level of the fair value hierarchy. The fair value hierarchy prioritises the inputs used to measure fair value into three broad levels (Levels 1, 2 and 3). Level 1 indicates that the fair value is determined from quoted prices in active markets, up to a point where there are unobservable inputs in Level 3. If an asset is traded in an active market, it is easy to obtain the quoted price. If, however, an asset such as goodwill is not traded in an active market, Level 2 or Level 3 would have to be employed. In case of Level 3 fair

value estimates, managers have private information regarding the appropriate values to be used for model inputs, as well as the true economic value of an asset (Landsman, 2007).

Both kinds of estimate available to determine the value of goodwill, namely value in use or fair value minus cost to sell, require projections of future cash flows. These future cash flows are projected on the basis of management discretion, which can be used to convey private information regarding the future cash flows and to indicate that impairment is not required.

One study, performed on Australian firms by Bond *et al.* (2016), tested the association between asset impairments and factors relevant to the determination of the recoverable amount. Most of the firms in their study did not recognise asset impairments or recognised only immaterial amounts, even when indicators of impairment were present. Thus, even though these firms are required to follow fair value accounting in terms of *IFRS 3* and *IAS 36*, the results suggested that they failed to do this. Bond *et al.* (2016) also found that the mandated disclosure in terms of *IAS 36* was minimal. This made it very difficult for financial statement users to value accounting decisions critically. Given the findings reported by Bond *et al.* (2016), it is clear that the importance of disclosure on the determination of the asset values needs to be explored in the light of *IAS 36*. Sufficient disclosure on asset values based on their fair values could reduce uncertainty for financial statements users and may be used in determining firm value.

2.2.5 IAS 36: Impairment of assets

Goodwill acquired from a business acquisition or a merger must be tested for impairment annually, or as soon as indicators of impairment are present. The impairment of goodwill is a result of the deteriorating economic performance of the acquired business (AbuGhazaleh *et al.*, 2011). Each year an entity should consider both external and internal sources of information as an indication of whether an asset may be impaired (IASB, 2004b) External sources include significant changes in the business climate, unanticipated competition, adverse action by regulators and/or changes in business contracts with major suppliers and distributors (Seetharaman, Sreenivasan, Sudha, & Ya Yee, 2006). Internal sources include incorrect budget

forecasting at the acquisition date, the loss of key personnel, a change in the company's name and/or failure to manage the acquisition (Seetharaman *et al.*, 2006).

The objective of *IAS 36* is to reflect the true value of a firm's intangible assets on its Statement of Financial Position, including goodwill (Verriest & Gaeremynck, 2009). According to *IAS 36*, intangible assets, including goodwill, should not be recognised at more than their recoverable amount. If goodwill is carried at more than its recoverable amount, the entity should recognise an impairment loss. *IAS 36* defines the recoverable amount as the higher of the assets' value in use, or the assets' fair value less costs of disposal (IASB, 2004b). To calculate the assets' value in use, the entity should estimate the future cash flows that it expects to derive from the asset, the possibility of future changes in those future cash flows, the market risk-free rate used in the calculation, the price for bearing the uncertainty inherent in holding the asset, and other factors, such as illiquidity (IASB, 2004b). The standard provides guidelines regarding the measuring of future cash flows in paragraph 33, stating that projections of future cash flows must be representative of management's best estimate of the range of economic conditions that will exist over the remaining useful life of the asset(s). These projections should be based on the most recent financial forecasts, but should exclude any estimated future cash flows expected to arise from future improvements or restructuring of the asset. A steady or declining growth rate must be used. The growth rate should not exceed the long-term average growth rate for the industry or country the company operates in (IASB, 2004b).

Because managers can use their discretion in determining which variables to use in the goodwill calculation, it can be questioned how fair these estimates are (Avallone & Quagli, 2015). The subjectivity involved in performing goodwill impairment testing could lead to possible earnings management, an area with high risk of opportunistic behaviour (Carlin & Finch, 2010). For instance, in their study Bond *et al.* (2016) found that only a few firms from their sample recognised goodwill impairment, even though there were observable indicators of impairment. This finding suggests that asset impairment could be discretionary, and indicates possible earnings management. According to Jerman and Manzin (2008), one should ask whether *IAS 36* does indeed provide for more relevant and reliable accounting information, or whether it merely opens up new possibilities for creative accounting.

Wines, Dagwell, and Windsor (2007) examined the change in the goodwill accounting regime with the aim of identifying challenges faced by preparers of financial statements, internal auditors and those involved in corporate governance in complying with the new requirements. Wines *et al.* (2007) argue that numerous assumptions have to be made in the valuation process regarding CGUs, particularly when estimating fair value, value in use and the recoverable amount. Wines *et al.* (2007) stress the importance of auditors in ensuring that users of the financial statements can rely on management's abilities and judgements. It is thus crucial to ensure an entity has sound corporate governance mechanisms in place, to reduce the risk of creative accounting. Firms that have good corporate governance in place are likely to provide sufficient disclosure, as required by the relevant accounting standards. Similarly, the results of Kabir and Rahman's (2016) study reiterate the importance of strong corporate governance arrangements in companies to ensure rigorous implementation of the IFRS in general, and of the standards applying to goodwill accounting in particular.

2.2.6 Goodwill impairments: disclosure requirements

In order to determine whether goodwill impairment disclosure is value relevant, it is important to establish whether firms comply with the disclosure requirements set out in IAS 36. If an accounting standard is nominally adopted, but is not accompanied by full compliance with the disclosure requirements, the effectiveness of the standard is limited (Khairi *et al.*, 2012).

IAS 36, paragraph 130, provides guidelines on what additional information an entity should disclose when goodwill impairment is recognised in the 'Statement of Comprehensive Income' for a particular year:

- for each individual CGU, events and circumstances that led to the recognition of the impairment loss, as well as the amount recognised;
- the recoverable amount;
- whether the recoverable amount is based on fair value less costs of disposal, or its value in use, although, due to the fact that goodwill cannot be sold as an individual asset, the assessment of fair value less costs to sell might not be possible (Avallone & Quagli, 2015); and

- with regard to the calculation of the recoverable amount, detailed information on variables used; including variables such as the future cash flows, market risk-free rate and the price of any uncertainty inherent in the asset and other factors.

In this context, it is worth noting that in a study by Avallone and Quagli (2015) collecting data on goodwill reporting from the annual reports of a European sample of firms, the researchers reported that of the original 656 firm-years observations, 328 had to be excluded because of a lack of information of the variables used in the goodwill impairment tests (Avallone & Quagli, 2015). Bond *et al.* (2016) also found in a study one year later that the mandated disclosures were minimal, and that firms did not provide enough information in their annual financial statements.

A number of studies performed on goodwill impairment focused on the particular reasons given for the goodwill impairment during the periods they reviewed (Jordan, Clark, & Vann, 2007; Masters-Stout, Costigan, & Lovata, 2008; Ramanna & Watts, 2012). The reasons for a firm's impairing its goodwill are important, and the quality of goodwill impairment disclosure in the financial statements should assist analysts in the valuation of a firm. However, although the studies listed above contributed to the literature by identifying and explicating the underlying reasons for goodwill impairment, they did not consider the quality of disclosure adequately. These prior studies mostly provide descriptive statistics about the content of disclosure, without considering the quality of disclosure (D'Alauro, 2013).

Attempting to provide more insight on the quality of goodwill disclosure, Kabir, Rahman, and Su (2017) investigated the association between goodwill impairment loss and goodwill impairment test-related disclosures. They developed a disclosure index based on the requirements of IAS 36. Kabir *et al.*'s (2017) study used IFRS as a guideline for its Australian sample. Another study investigating the information content of business combinations disclosures in a US setting was conducted by Shalev (2009), who used US GAAP as a guideline.

In order to interpret and compare studies performed on samples after the application of different accounting standards, it is important to understand the differences between the accounting standards under investigation. With the exception of China, which uses

its own GAAP, and the US, which follows US GAAP, most countries use the IFRS. It is, however, important to understand the differences between these two sets of reporting standards to determine the comparability of research undertaken internationally on the same topic. For the purposes of the present study, which uses South African data from a country adhering to IFRS, one needs to determine whether there are differences between US GAAP and the IFRS that govern business combinations and goodwill impairments.

2.2.7 Differences between goodwill accounting requirements: US GAAP and IFRS

Although they seem similar, there are some differences between *SFAS no. 142* and *IFRS 3* even at the adoption stage. The first is the initial measurement of goodwill at acquisition date. Another is the definition of goodwill: in terms of *SFAS no. 142*, goodwill is the excess of the cost of an acquisition price over the fair value of the acquired net assets; however, according to *IFRS 3*, it is the difference between the cost of the acquisition and the fair value of identifiable assets, liabilities as well as contingent liabilities. Therefore, if contingent liabilities do exist, the recorded goodwill would differ when measured in terms of *SFAS no. 142* and when measured in terms of *IFRS 3*. A third difference relates to the basis used for the impairment testing of goodwill: *SFAS no. 142* uses fair value, whereas *IAS 36* uses the recoverable amount, which is the higher of the fair value less costs of disposal and its value in use. A fourth difference is that *SFAS no. 142* refers to a 'reporting unit' and *IFRS 3* to a 'CGU'. A 'reporting unit' can be described as a distinct business line, which can produce separate financial statements. *SFAS no. 142* specifies that a reporting unit cannot be at a lower level than an operating unit, which implies that the level at which goodwill is tested for impairment under *SFAS no. 142* could be higher than that at which it is tested for impairment under *IAS 36*.

These differences led to amendments to the current statements to improve the accounting of business combinations and achieve convergence between the standards (Jerman & Manzin, 2008). In December 2007, the FASB published the revised *SFAS no. 142*, which became effective in December 2008; in January 2009, the IASB revised *IFRS 3* for periods taking effect in July 2009. Some small differences remain, but the main differences have been eliminated, such as how and whether

contingent liabilities are included. The changes made by the FASB were more fundamental than those made by the IASB, such as including contingent liabilities in the calculation of goodwill at the acquisition date. Both accounting statements requirements now demand annual impairment testing (or more frequent testing if circumstances indicate additional impairment), and both prohibit any reversal of goodwill impairment. Another very important similarity is that the approaches of both *SFAS no. 142* and *IFRS 3* rely solely on management estimates of goodwill's current value (Ramanna & Watts, 2012), which could have an effect on the value of subsequent impairment of goodwill.

2.2.8 Differences between goodwill impairments accounting: US GAAP and IFRS

Both *SFAS no. 142* and *IAS 36* require goodwill acquired from a business combination to be tested for impairment annually. Grant and Thornton (2017) point out that the indicators of possible goodwill impairment are similar for *SFAS no. 142* and *IAS 36*, with the exception that, according to *IAS 36*, a change in market interest rates or other market rates of return is an indicator of impairment.

A major difference between *SFAS no. 142* and *IAS 36* is that *SFAS no. 142* requires goodwill to be tested for impairment using a two-step process (Grant & Thornton, 2017). In the first step, the carrying amount of the reporting unit is compared to its fair value. If the carrying amount exceeds fair value, the second step must be performed. In the second step, the implied fair value of the reporting unit is compared to its carrying amount. If the carrying amount exceeds the implied fair value, an impairment has to be recognised. According to *IFRS 3*, an impairment loss should be recognised if the recoverable amount is less than the carrying amount. The recoverable amount is the higher of the fair value less costs of disposal and its value in use. The cost and complexity of the second step in evaluating goodwill impairments has resulted in yet another amendment in the US GAAP accounting standard governing goodwill impairments. The accounting statement update on intangibles assets, goodwill and others, was issued on 12 May 2016 (FASB, 2016). This update eliminates the second step of goodwill impairment testing. The FASB requires entities to apply the new guidance for annual, and any interim, impairment tests for periods, beginning after 15 December 2021, with early adoption allowed (FASB, 2016). Subsequent to the

amendments, the two different standards now contain similar guidance on how goodwill impairments should be accounted for (Wen & Moehrle, 2016). The update discussed above should improve convergence of goodwill accounting guidance. In this regard, then, it is worth noting Knauer and Wöhrmann's (2016) investigation of whether there is a difference in the information content of goodwill impairment between statements prepared under *SFAS no. 142* versus ones prepared under *IAS 36*. They conclude that the market reaction does not depend on the accounting regime, *SFAS no. 142* or *IAS 36*, because of the similarity of the two standards.

One of the objectives of the present study is to determine whether goodwill and subsequent impairments are value relevant. The study also investigates whether goodwill impairment test-related disclosure could have an impact on firm value. The reasons for goodwill impairment and the disclosure requirements are similar under US GAAP and IFRS; therefore, the results of the present study are relevant across different jurisdictions.

An important similarity between US GAAP and IFRS is that both advocate that entities have sound corporate governance mechanisms in place. This aspect is explored in the next section.

2.2.9 Corporate governance and accounting quality

'Corporate governance is about the governance of corporations' (Brown, Beekes & Verhoeven, 2011:98). In recent years, large corporations have come under increasing pressure to conduct their business and operations in a more responsible and transparent manner (Clayton *et al.*, 2015). South Africa has been on the forefront of the move to change from conventional company reports to integrated reporting. This enables a firm to fulfil its obligations by providing relevant, timely and understandable information to its stakeholders (Clayton *et al.*, 2015). According to Hung (2000), shareholder protection is an institutional factor that characterises a country's corporate governance environment.

Brown *et al.* (2011) performed a detailed review of accounting and finance literature on corporate governance. In their study, they emphasise the importance of how corporate governance is measured. The construction of corporate governance should be sensitive to local institutional arrangements and should capture both internal and

external aspects of governance. If corporate governance is implemented effectively, it should succeed in fulfilling its role of reducing agency costs (Brown, Beekes, & Verhoeven, 2011). In this regard, then, it is relevant that Gu and Lev (2011) have found that possible agency costs may arise from goodwill impairments as a by-product of the use of overpriced shares to acquire an overvalued target. Gu and Lev (2011) argue that these agency costs could be reduced or even avoided if effective corporate governance mechanisms are put in place.

A key aspect of improving the corporate governance of a firm and reducing agency costs is the composition of a company's board of directors. Ahmed and Duellman (2007) investigated the relation between accounting conservatism and board of director characteristics, such as board independence and the strength of outside directors' monitoring incentives of US firms. The study incorporated three conservatism measures: an accrual-based measure, a market-based measure, and a measure of the asymmetric timeliness of earnings. The percentage of inside directors, the average number of additional directorships held by a firm's directors, chief executive officer (CEO)/chair of the board of directors' separations, the percentage of shares held by outside directors, and board size were all used as proxies for board independence. Ahmed and Duellman (2007) found a negative relation between the percentage of inside directors on the board and conservatism, and a positive relation between outside director ownership and conservatism. In their study, CEO/chair separation was not related to accounting conservatism, and the average number of outside directorships was negatively related to conservatism. Lastly, it was found that board size was not significant. Overall, Ahmed and Duellman (2007) concluded that their evidence was consistent with the argument that accounting conservatism assists directors in reducing firms' agency costs.

It is clear from the literature that firms that have good corporate mechanisms in place tend to report higher quality accounting information (Aldamen & Duncan, 2016; Clayton *et al.*, 2015). This higher quality accounting information can assist shareholders in their valuation processes. Aldamen and Duncan (2016) investigated whether corporate governance had a positive effect on accruals quality during the global financial crisis (2008-2009) on a sample Australian firms. Their evidence suggests that even during this difficult period, good corporate governance increased

the quality of accounting information. It reduced the level of information asymmetry and thereby enhanced accruals quality. This is of utmost importance when shareholders are required to determine the value of an intangible asset such as goodwill, an asset which is known to be complex and is sometimes even ignored by shareholders (Whitwell *et al.*, 2007).

AbuGhazaleh *et al.* (2011) hypothesized that firms with effective corporate governance mechanisms are more likely to report on goodwill impairment. Findings suggest that such firms exercise their accounting discretion to convey their private information about the underlying performance of the firm, as opposed to simply acting opportunistically. A similar study was performed by Chao and Horng (2013), who showed that discretionary write-offs and a tendency to act opportunistically is more pronounced in weakly governed firms. These findings suggest that a strong governance setting is likely to constrain discretionary behaviour.

The reliability of accounting information could be evaluated in terms of the level of compliance with accounting standards. Glaum, Schmidt, Street, and Vogel (2013) examined the compliance with IFRS in various European countries. Findings from Glaum *et al.*'s (2013) study suggest that compliance is simultaneously driven by company-specific and country-specific factors. This implies that accounting traditions and other country-specific factors play an important role in compliance, despite the use of shared reporting standards (Boennen & Glaum, 2014). Company-specific factors such as the importance of goodwill positions, prior experience with the IFRS, the type of auditor, the existence of audit committees, the issuance of equity shares or bonds, ownership structure and the industry the company operates in were considered in Boennen and Glaum's (2014) study. They tested for country-specific factors by looking at the strength of the enforcement system and the size of the national stock market to see whether these play important roles in compliance. They found that these country-specific factors not only influence compliance directly, but also moderate some company-level factors. This highlights the importance of understanding the standards that are applied in the country in which the sample firms operate.

If compliance depends on country-specific factors, it is important to bear in mind in the present study that the JSE is the largest stock market in Africa and enforces strict

adherence to JSE requirements by all firms listed on this exchange. One of these requirements is to comply with the IFRS as well as the *King IV Report* (King Committee on Corporate Governance in South Africa, 2016), which governs corporate finance. Therefore, for the firms used in the present study, and which are all listed on the JSE, good corporate governance mechanisms should in place. South Africa is at the forefront of good corporate governance practices and therefore provides an ideal setting for this study.

A study by Verriest and Gaeremynck (2009) considered whether good corporate governance is associated with goodwill impairments. Their study selected a sample of firms with a high likelihood of having to impair their goodwill. The selection was done on the assumption that when a firm's book value of equity, minus its market value, is smaller than the amount of goodwill reported on the balance sheet,³ goodwill impairment is likely. For these firms, Verriest and Gaeremynck (2009) investigated two impairment decisions – firstly, whether a firm will impair goodwill or not, and secondly, what amount and quality of information to provide in the annual report in terms of their goodwill impairment tests and decisions. Based on the literature, Verriest and Gaeremynck (2009) hypothesised that governance quality would have a significant impact on both of these decisions. Their findings confirmed that management's decision to impair goodwill is significantly and positively influenced by a firm's corporate governance quality. However, because of the managerial discretion embedded in goodwill impairment decisions, there is a risk of agency costs. Firms can mitigate this if they have sound corporate governance mechanisms in place.

2.2.10 Agency costs embedded in goodwill impairments

Every year, firms that report goodwill are required to test for possible impairment. To test for an impairment loss, the recoverable amount of each CGU is compared with its carrying value. In the event that market prices are not available, which is likely in many goodwill valuation situations, the recoverable amount should be calculated by using the value in use methods (Knauer & Wöhrmann, 2016). For each CGU, a firm has to determine the future cash flows expected from that CGU, and an appropriate discount rate to calculate the present value of those future cash flows. Both of these variables

³ 'Balance sheet' refers to the Statement of Financial Position – it is a term still found in older studies.

depend on management's subjective estimates, and thus on management's discretion. By requiring annual goodwill impairment testing, the IASB implies that private information should be conveyed to the public in the event of goodwill impairments (Knauer & Wöhrmann, 2016).

However, agency theory suggests that management may use any discretion to its own advantage and may use that discretion opportunistically. Managers may have incentives to delay an impairment charge for reputational or compensation reasons (KPMG, 2014). Day (2020) agrees that managers may exploit the dependence of the impairment test on management estimates. In one study, Gros and Koch (2015) found that managers tend to use areas of discretion informatively if they can convey positive information to market participants, but they found no evidence for conveying negative information. Therefore, it seems that managers use their areas of discretion to meet or beat analysts' earnings forecasts.

There is growing evidence that indicates that higher quality financial reporting is generally found in jurisdictions where incentives are provided for transparency (Amiraslani, Latridis, & Pope, 2013). The level of managerial opportunism depends on the legal system of the country in which companies operate (Knauer & Wöhrmann, 2016). According to Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), legal systems protect investors, because they regulate investors' rights to exercise their power against management. Porta *et al.* (1998) show that common-law countries, including South Africa, have the strongest legal protection for investors. Similarly, Ali and Hwang (2000) explored associations between measures of the value relevance of financial accounting data and several country-specific factors, such as common-law countries versus civil-law countries. They reported that the value relevance of accounting data is higher in common-law countries. Investor protection in common-law countries counters opportunistic behaviour by management, and mitigates against any incentives to manage accounting earnings. More recently, Knauer and Wöhrmann (2016) have confirmed that the legal protections customary in common-law countries can limit management discretion and enhance the reliability of financial information.

Huikku, Mouritsen, and Silvola (2017) are also of the opinion that goodwill impairment can be reliable. In a study in Finland, Huikku *et al.* (2017) conducted 53 interviews with financial accountants, external valuation experts, the financial supervisory authority,

auditors, financial analysts, investors, creditors, media and academics. The starting point for their study was the difficulty embedded in determining goodwill. Firstly, goodwill is a residual value and has no associated discernible and separable tangible assets. Secondly, the goodwill value is about the future. To address this problem, the authors tried to determine how financial accounting practices produce goodwill impairment values and whether the financial calculation is reliable. From these interviews, a number of considerations confirming the reliability of goodwill impairment emerged. One of the key considerations is that the goodwill impairment calculation is part of processes such as budgeting and strategy-making. Inherent to the budgeting process is past cash flows, which adds reliability to the cash flows used in the goodwill impairment calculation. Huikku *et al.* (2017) argue that the budgeting process is not done only for the purpose of goodwill impairment testing, but also generally for managing the business, and therefore this strengthens the reliability of the process. Interviewees also emphasised that budgeting is a process of moderation to make forecasts that are somewhat in line with past performance, so that the budget will be more recognisable and reliable. The growth rates used in the goodwill impairment calculation are traced from many and diverse places, most from external origins that propose growth, not for the individual firm, but for the industry and economy at large (Huikku *et al.*, 2017). Agency costs are therefore reduced because parties (agencies) other than the firm's financial accountant are involved in the calculation. These other agencies operate within and outside the firms concerned and may include the managers negotiating the budgets, statistical bureaus and consulting firms, all presenting calculations which are used in the goodwill impairment calculation.

Additional reassurance regarding the reliability of goodwill impairment is obtained through the auditing process. First, a firm's auditing committee has to be convinced of the goodwill impairment calculation. Then the calculation is checked by external auditors. The auditors' role in goodwill impairment and its reporting is to review the firm's strategy by testing the reliability of budgets and forecasts, and whether the growth rates used to calculate the impairment value are in line with the market (Huikku *et al.*, 2017). Auditors also review internal and external sources that may indicate possible goodwill impairment.

The events and circumstances leading to the impairment of goodwill can be identified from internal sources or external sources. Internal sources are often unverifiable, and could indicate that a higher level of managerial discretion has been used. By contrast, external sources are likely to be verifiable and could result in a less negative market reaction in the event of goodwill impairment, as Knauer and Wöhrmann (2016) found. Bearing these findings in mind, the present study differentiates between internal and external sources in conducting its analyses, when investigating the ways in which reasons are provided by management for impairing goodwill.

The use of managerial discretion in determining whether there is goodwill impairment, and its extent, does give rise to an agency problem, even where this is mitigated. The present study contributes to the existing literature by examining South African firms, in a common-law setting, which is likely to mitigate agency costs. It is important to understand the reasons for impairments to goodwill in order to determine the extent of managerial discretion, which could result in agency costs. In the next section, the extent of managerial discretion in the accounting for goodwill is therefore investigated.

2.3 GOODWILL IMPAIRMENTS

2.3.1 Initial indicators of goodwill impairment

One of the first indications of whether goodwill is valued correctly or incorrectly is the market to book (MTB) value (KPMG, 2014). This ratio is calculated by comparing the accounting value (historical cost) of a firm to its market value. The market value is determined in the stock market through the firm's market capitalisation. If firms have an $MTB < 1$ it may be an indication that the market expects a goodwill impairment. This is based on the assumption that goodwill is likely to be economically impaired, and that an accounting write-off is due (Ramanna & Watts, 2012). According to Ritter and Wells (2006), there is a growing disparity between the firm book value of equity and the market value of equity, arguing that two potential causes of this could be non-recognition of intangible assets (such as goodwill), and accounting conservatism (Ritter & Wells, 2006). According to a study performed by KPMG (2014), the MTB ratio of less than 1 does not warrant an automatic impairment loss, but it is an indicator that requires further assessment.

Another indicator for possible goodwill impairment is where a firm has large goodwill balances compared to its counterparts or to prior years. Large goodwill balances together with deteriorating profits could suggest an initial overpayment for a target firm. Subsequent to the acquisition date, the target firm may not perform as initially anticipated and this could result in decreased profits. Li and Sloan (2015) found evidence that investors do not understand that large goodwill balances and deteriorating profits will ultimately result in impairments. The sample used in Li and Sloan's (2015) study was divided into two groups, namely firms that did impair goodwill and those that did not. Firms that did impair goodwill had goodwill amounting to almost 20% of total assets, whereas the goodwill of non-impairing firms amounted to 13.6% or less of total assets. The sample also suggested that impairing firms have a higher degree of deteriorating profits. In order to determine whether investors comprehend that large goodwill balances and deteriorating profits will eventually result in goodwill impairments, Li and Sloan (2015) compared size-adjusted stock returns for portfolios formed on firms with a predicted probability of goodwill impairments on the one hand to those for portfolios formed on firms with lower predictability. The results suggest that the stock returns were significantly positive for firms in the lower deciles of predicted probability of goodwill impairments, indicating that investors tend to overestimate the impairment probability of these portfolios (Li and Sloan (2015)).

The requirements set out in *IAS 36* are clear on how management should account for goodwill impairments. Management is also required to determine whether goodwill is impaired every year. This decision, and the calculations surrounding the decision to impair or not to impair, depends heavily on managerial discretion.

2.3.2 Management discretion when calculating goodwill impairments

According to *IAS 36*, reported goodwill is subject to annual impairment testing. This involves comparing the fair value of a CGU to its carrying amount. The fair value calculation requires an estimate of the future cash flows expected to arise from the particular CGU, and of a suitable discount rate in order to calculate the present value. Therefore, when a company reports goodwill impairment, it can give some insight into the estimated future cash flows of the specific CGU. In this regard, Watts (2003) has raised some concerns on the objectivity of the determination of goodwill's fair value. He claims that the new impairment regime can be used to creatively manage movable

expenses by moving them from one period to another in order to appear to achieve earnings targets.

In a more recent study, Li and Sloan (2015) tested the impact of annual impairment testing on the accounting and valuation of goodwill. Their results suggest that goodwill impairments tend to lag two years behind deteriorating operating performance and stock returns. This confirms the concerns raised by Watts (2003) of the lack of verifiability of valuation estimates used by managers when determining the variables used in the goodwill impairment calculation.

Building on these findings, Filip, Jeanjean, and Paugam (2015) investigated whether management can postpone the recognition of goodwill impairments by manipulating future cash flow predictions. They also investigated the consequences of such manipulation on a firm's future performance. Their sample included US firms that were suspected of postponing goodwill losses. They identified these firms by comparing firms that did recognise goodwill impairments to ones that did not. Firms that did not recognise goodwill impairments but that had an MTB value below one for two consecutive years were classified as firms suspected of postponing goodwill impairments. The reason for the second criterion was that managers of firms with an MTB value below one for consecutive periods are likely to delay goodwill impairments in order to boost earnings (Roychowdhury & Martin, 2013). Filip *et al.* (2015) were able to prove their hypothesis that firms suspected of postponing goodwill losses exhibited significant positive discretionary cash flows and real activity manipulation. This highlights the fact that goodwill accounting provides opportunities to manage real activities, confirming the concerns regarding possible managerial manipulation raised by critics of the standards, such as Watts (2003).

Mazzi, Liberatore, and Tsalavoutas (2016) have shown that it is not only market participants who are concerned about possible managerial opportunism under IAS 36, but also the preparers of financial reports. They surveyed CFOs of listed Italian firms. According to Mazzi *et al.* (2016), IAS 36 is perceived as an atypical standard among the IFRS, and because of the subjective interpretation that it allows, it can result in creative accounting.

Another example of problems associated with the management discretion permitted in goodwill impairments recognition is the application of opportunistic discount rates when discounting future cash flows (Carlin & Finch, 2010). Carlin and Finch (2010) found that Australian and New Zealand firms used lower than expected discount rates to avoid unwanted impairment losses. They established this by calculating an estimated discount rate for each firm in their sample, using the capital asset pricing model (CAPM). The use of the CAPM is appropriate as a discount rate, because it represents the current market assessment and the underlying risks of a CGU. CAPM is also a preferred method stipulated in *IAS 36*. Carlin and Finch (2010) then compared the discount rates used by the sample firms in their study to the calculated discount rate based on the CAPM. The results showed that there were discrepancies between the discount rate used by the sample firms and the values emanating from the application of the CAPM. Carlin and Finch (2010) also found that a number of the sampled firms used one single discount rate for the entire goodwill balance, and thus were not differentiating between different CGUs.

According to *IAS 36*, an appropriate discount rate should be used for each defined CGU, based on its individual risk profile. It is unlikely that the risk characteristics for all the CGUs that contribute to the goodwill balance are the same. However, in reality, firms often use the same weighted average discount rate (WACC) for all calculations, including goodwill impairment (Huikku *et al.*, 2017). This raises further doubts regarding the efficacy of goodwill impairment testing. Some difficulties inherent to the WACC calculation are determining the beta value if the firm is unique, and whether the current or targeted capital structure should be used. However, as with the cash flows used in the goodwill impairment calculation, the WACC used is audited by external auditors, and, while managers are concerned with the firm, auditors are interested in the link to the industry average (Huikku *et al.*, 2017).

A study performed by Avallone and Quagli (2015) aimed to identify whether the variables that managers use in impairment testing are selected in order to avoid or reduce goodwill impairments. They considered the difference between the long-term growth rate that managers used in the impairment calculation and similar rates estimated from publicly available external sources. Their results proved that growth rate manipulation is a significant explanatory variable in the avoidance or reduction of

an impairment write-off. Avallone and Quagli (2015) recommend that standard-setters mandate a higher level of disclosure if the managers' estimates used in the impairment test differ substantially from the existing market evaluations. This could reduce the possibility of opportunistic behaviour.

It is therefore evident from the literature that management can manipulate the calculation by means of future cash flow projections and/or the discount rate by using their discretion. Management discretion in the application of *IAS 36* is thus a concern, as, for instance, Carlin and Finch (2009) and Filip *et al.* (2015), have shown.

Another concern is directly associated with the actual adoption of *SFAS no. 142* or *IFRS 3* and the recognition of goodwill impairments at that time. Management was allowed to expense goodwill impairments as a 'change in accounting principle' because of the adoption of a new standard. Hence, the factors that facilitate adoption-year impairments are likely to differ from factors that facilitate reported impairments in subsequent years (Ramanna & Watts, 2012). If the adoption year is included in the sample period, the economic reasons for goodwill impairment could be overshadowed or obscured by the use (or in some cases the misuse) of a 'change in accounting standard'. This is a possible weakness in prior studies investigating the underlying reasons for goodwill impairment that included the adoption period as part of the sample period. The period covered by the present study (2006 – 2017) commences two years after the adoption of *IAS 36*, ensuring that any goodwill impairments reported were not affected by adoption-year impairments. They may, however, be a result of subsequent events that led to the impairment of goodwill. This decision was made to ensure that the actual economic reasons for goodwill impairments could be determined.

2.3.3 The information content embedded in goodwill impairments

The recognition of goodwill impairment is essentially an acknowledgement by management that assets (goodwill) were overstated. The market is likely to view this negatively: not only have assets been overstated, but the impairment could have been the result of poor decision-making by overpaying for a target firm. However, it is possible that goodwill impairment can be used in a positive manner.

As indicated in Section 2.3.2, the amount of goodwill impairment is determined by the future cash flow projections made by management. With reference to this variable used in the goodwill impairment calculation, Bostwick *et al.* (2016) examined whether goodwill impairments can in their turn assist in the prediction and forecasting of future cash flows. Their results confirm that goodwill impairment does improve 1-year-ahead cash flow predictions and forecasting. The predictive power was further confirmed by including non-recurring charges into the model, such as restructuring, merger and acquisitions costs and asset write-downs (Bostwick *et al.*, 2016). Even when these non-recurring items and other market-related information were included, goodwill impairment still had the highest predictive power for future earnings (Bostwick *et al.*, 2016). Based on these findings, analysts, investors, creditors, and others interested in a firm's future earnings should include goodwill impairment information in their consideration when predicting future cash flows. Bostwick *et al.* (2016) study period was 2001 to 2009, a period after firms were required to adopt *SFAS no. 142*, and results from their study prove that users of financial statements rely on management's future cash flow projections.

A study performed by Hirschey and Richardson (2002) investigated discretionary goodwill impairment announcements from 1992 to 1996, therefore in the period before the adoption of *IFRS 3*. Hirschey and Richardson (2002) hypothesised that goodwill write-off decisions are meaningful to the extent to which they can provide information which could give insight into future changes in a company's earnings. They found that goodwill write-offs have a statistically negative effect on share prices. It is noteworthy that despite write-offs' being negative, investors in their sample did consider goodwill impairment decisions in their valuation of a share. The goodwill impairments in Hirschey and Richardson's (2002) study were, however, in a period when it was not yet mandatory to perform annual impairment testing. Therefore, it could be that goodwill impairment was only recognised after management could not delay doing so any longer. The negative reaction in terms of the share price may therefore be expected. For the period covered in the present study, goodwill is subject to annual impairment testing, which could increase the magnitude of goodwill impairments. Despite the fact that investors still regard the write-off of an asset as a negative event, timely impairments and proper disclosure thereof could elicit a positive sentiment among investors.

Whether goodwill impairment is expected or comes as a surprise may also have an impact on stock analysts' reactions. Xu *et al.* (2011) are of the opinion that shareholders generally view goodwill impairment charges negatively, but that this is moderated by the financial health of the particular firm (whether it is a profit- or loss-making firm). Results from Xu *et al.*'s (2011) study indicate that investors view the goodwill impairment charges of profitable firms negatively, but that this signal is more muted for loss-making firms. This shows that there is a benefit to continuing annually to examine and disclose goodwill impairment information, as required by IAS 36.

It is clear that market participants do use the information conveyed by the disclosure of goodwill impairments in their decision-making, whether positively or negatively. Distinguishing between expected and unexpected impairment could further confirm whether market participants use the information content embedded in goodwill impairment disclosures. In their study, Bens *et al.* (2011) discriminated between actual goodwill impairments and expected goodwill impairments. They posited that impairments that come as a surprise could have a negative impact on analysts' valuations. A significantly negative stock market reaction was indeed found between market reaction and unexpected goodwill impairments, suggesting that investors used these impairments (and their information content) in their assessments of firm value. A less significant market reaction to goodwill impairments was found in companies with low information asymmetry (where a high percentage of shares are held by institutional investors). This implies that the information content is included in the pricing of the shares of such companies (Bens *et al.*, 2011). For smaller companies that found it costly to implement impairment tests, the market reaction to reported impairments was also not as significant (Bens *et al.*, 2011).

Additional information which could be conveyed within goodwill impairment information was investigated by Chalmers, Godfrey, and Webster (2011) and Godfrey and Koh (2009). With specific reference to the period after the adoption of IAS 36, Chalmers *et al.* (2011) investigated whether the impairment regime reflects the underlying economic value of goodwill better than systematic amortisation does. A firm's underlying investment opportunity sets capture projects that foster firm growth. Chalmers *et al.* (2011) compared the association between goodwill accounting charges and a firm's economic investment opportunities under the amortisation and

impairment regimes. The evidence suggests that the association between goodwill charges against income and a firm's investment opportunity sets is stronger under the IFRS regime than under the GAAP regime. This implies that impairment charges reflect the underlying economic attributes of goodwill better than amortisation charges do (Chalmers *et al.*, 2011).

Godfrey and Koh (2009) examined whether goodwill impairment reflect a firm's investment opportunities, with specific reference to the first years of the US goodwill accounting regime. Their hypothesis is based on the notion that goodwill impairment reflects decreased economic goodwill and, therefore, the firms' investment opportunities (Godfrey & Koh, 2009). Their results suggest that goodwill impairment is negatively associated with firms' underlying investment opportunity sets, a finding which supports the IASB's argument that an impairment test regime can reflect firms' underlying economic attributes. It is also consistent with the expectation that firms that are faring well economically have less reason to record large impairment losses. Godfrey and Koh (2009) do, however, conclude that accounting discretion is likely to be exercised in complex ways, especially if there are once-off opportunities to do so.

From the above discussion, it can be deduced that it is important to understand the reasons for goodwill impairment and its disclosure. As noted from the literature, goodwill impairments can be perceived as negative because of the inherent managerial discretion that is applied (Ferramosca, Greco, & Allegrini, 2017). However, some studies did provide a positive aspect of goodwill impairments by presenting evidence that analysts use the information content of goodwill impairments to predict a firm's future profit-making potential (Hirschey & Richardson, 2002) and to gain insight into investment opportunities (Chalmers *et al.*, 2011; Godfrey & Koh, 2009). Mindful of the various criticisms of the goodwill impairment regime, the present study explores the determinants of goodwill impairment decisions, as discussed below.

2.3.4 Determinants of goodwill impairment decisions

Embedded in the information content of impairments are the underlying reasons for these write-offs. The implementation of *IFRS 3* was intended to provide users with more useful and value relevant information, but, in practice, often goodwill impairments are driven by managerial self-interest and earnings management (Watson &

Lhaopadchan, 2010). As Watts (2003) explains, if conservatism is eliminated, it will change managerial behaviour and impose significant costs on investors and the economy in general. If verifiable conservative information is provided to market participants, it can be used in their own valuation and to calibrate for unverifiable information (Watts, 2003). As explained in Section 2.2.10, agency costs may arise from goodwill impairment decisions, but they can be reduced if accounting conservatism is in place (Aldamen & Duncan, 2016).

In the subsections below, several underlying reasons for goodwill impairment documented in prior literature are discussed.

2.3.4.1 Earnings management

Earnings management can be defined as the intentional misstatement of earnings resulting in bottom line numbers that would have been different if no manipulation had taken place (Mohanram, 2003). Mohanram (2003) argues that managed earnings are due to manipulative use of managerial discretion. It is therefore important for investors analysing financial statements to understand how managers can manipulate earnings. In the wake of the changes in the standards to goodwill accounting, Beatty and Weber (2006) investigated management adoption decisions based on the proposed changes. During the year of the adoption, goodwill impairments had to be written off below the reported net profit for the year as a result of an accounting change. Thereafter, goodwill impairments had to be recognised as part of operating expenditure. Beatty and Weber (2006) focused on the trade-off between recording certain impairments below the net profit in the adoption year, and recognising uncertain future goodwill impairments as income from continuing operations. They assumed that management would hope to avoid ever having to recognise goodwill impairment charges, but if necessary, in future years, earnings could be less as a result of the recognition in that particular year. Beatty and Weber's (2006) sample included firms which had a goodwill balance and for which the difference between the MTB of their equity was less than their recorded goodwill. The evidence suggests that firms delayed goodwill impairments in order to achieve future bonuses, and improve a firm's turnover and debt contracting. It can therefore be concluded that economic incentives can result in unverifiable fair value estimates (Beatty & Weber, 2006).

Another study investigating whether the year in which *SFAS no. 142* was adopted was used to account for goodwill impairments as part of the accounting change was conducted by Jordan *et al.* (2007). These authors compared the financial characteristics of firms that reported goodwill impairment losses during the adoption year with the financial characteristics of firms that did not report impairments during that year. The results indicated that firms that were already depressed in that year took additional discretionary hits ('big bath' earnings management) as a result of goodwill impairments in the adoption year. More light was also shed on the effect of the new goodwill accounting regulations by Huefner and Largay III (2004). They found evidence that one third of the 100 US companies with the largest goodwill balances in 2001 in fact wrote off about 30% of their goodwill when US companies transitioned to *SFAS no. 142*.

Another study on a transition period was performed by Caruso, Ferrari, and Pisano (2016), based on an Italian sample. Italian legislation gives firms the option either to amortise goodwill over 10 to 20 years, or to apply the impairment rules set out in *IAS 36*. The option to decide whether, and to what extent, to impair goodwill, was widely used by the firms included in the sample, who decided to abandon the Italian amortisation rules and apply *IAS 36*. However, the majority of these firms did not impair goodwill at all, and therefore proof of earnings management practices could not be established by Caruso *et al.* (2016) following the adoption of *IAS 36*. However, their results did indicate that managers' behaviour changed fundamentally in Italy: since management could decide whether and to what extent to impair goodwill, many opted to stop using the Italian amortisation rules and to adopt the lower goodwill write-offs. This raises the question of whether managers who adopt *IAS 36* are indeed following the accountings standards requirements.

Also focusing on the regime change in goodwill accounting, Bepari and Mollik (2017) examined changes in the frequency and extent of goodwill write-offs. They compared the actual amount of goodwill impairment charge with the minimum 'as if' amortisation charge that would have been recognised under the amortisation regime. They found that the adoption of the impairment approach has decreased the frequency and amount of goodwill write-off. This leads to the conclusion that goodwill accounting under the impairment approach has not become more conservative than when the

amortisation approach still applied (Bepari & Mollik, 2017). Even during the global recession period, a large number of firms did not impair their goodwill, even though their MTB values were less than 1. These results were consistent with the findings of Li and Sloan (2015) and Hayn and Hughes (2006), suggesting that the new accounting method for goodwill may result in inflated goodwill balances (Bepari & Mollik, 2017).

Gonçalves, Ferreira, Rebelo, and Fernandes (2019) argue that the internal and external accounting control mechanisms are ineffective in preventing and controlling opportunistic use of accounting policies. They found that goodwill impairment losses were reported after a decrease in stock prices because the capital market had already incorporated the losses. Gonçalves *et al.* (2019) suggest that the accounting and financial reporting standard setters should consider different alternatives to reduce the discretionary power of managers.

According to *IAS 36*, management should base goodwill impairment decisions regarding the future cash flows of a CGU. Jarva (2009) investigated whether firms are indeed following this requirement. The findings suggest that goodwill impairments are associated with future cash flows and are more closely associated with economic factors than with opportunistic behaviour and earnings management. The reported impairments do, however, seem to lag behind the economic impairment of goodwill. A similar study performed by Lee (2011) failed to reveal whether goodwill impairments are used opportunistically or informatively. In his study, Lee (2011) did find that cash flow predictions improved after the adoption of *SFAS no. 142*, which supports the aim of the standard, namely to improve the informativeness and faithfulness of goodwill reporting.

Ramanna and Watts (2012) presented similar findings. They identified firms with market indications of goodwill impairments to test whether firms with the ability and motives to manage goodwill impairments actually do so. The criteria for their sample selection were firms that have both book goodwill and equity market values greater than equity book values. They included only firms that ended each of two consecutive fiscal years with MTB ratios above one, which suggests that the market expects possible goodwill impairments because of the likelihood that goodwill will be impaired. Ramanna and Watts (2012) investigated whether non-impairment is associated with the motives that agency theory predicts will affect management's accounting choices.

The proxies used in testing the cross-sectional variation in goodwill write-offs were CEO compensation concerns, CEO reputation concerns, exchange delisting concerns and debt covenant concerns. Their results indicate that managers use unverifiable discretion in applying *SFAS no. 142* to avoid timely goodwill write-offs, especially in circumstances where they have agency-based motives to do so.

Lee and Yoon (2012) studied a sample US firms which they divided into potential manipulators and non-manipulators, on the basis of the level of average absolute value of discretionary accruals reported in the period prior to the implementation of *SFAS no. 142*. Their first hypothesis was that the ability of a firm's earnings to predict future operating cash flows was different prior to and after the introduction of *SFAS no. 142*. Their second hypothesis stated that a firm's earnings persistence was different in the two reporting regimes. They found no change in the informativeness of the reported earnings of firms classified as potential non-manipulators. However, the predictive power of the reported earnings of the potential manipulator firms improved significantly after the implementation of *SFAS no. 142*. These findings suggest that managers could be providing additional information about the firm, using their managerial discretion. Several studies have also been performed to investigate whether discretion eliminates value relevance for intangible assets, and found that relevance still holds true (Barth, Clement, Foster, & Kasznik, 1998; Barth & Clinch, 1998; Higson, 1998).

Another study focusing on the possibility of earnings management embedded in the accounting treatment of goodwill impairments was performed by Caruso *et al.* (2016). They did not find evidence to support a finding of earnings management, but noted that firms are implementing their own varied strategies with regard to financial and managerial accounting practices.

2.3.4.2 Overpayment for target firms

If the purchase price of a target firm is higher than its book value, goodwill exists. According to Ramanna and Watts (2012), goodwill impairments are the only way managers are held accountable in the Statement of Comprehensive income for unallocated acquisition premiums. Therefore, the higher the price paid for the acquisition over the book value, the higher reported goodwill will be. According to *IFRS*

3 and IAS 36, a rational party would not overpay for a target firm, but in reality, rational parties often do so (Bauer *et al.*, 2014). Zining *et al.* (2011) found evidence that overpayment for target firms is a predictor for subsequent goodwill impairments, and reported a positive correlation between goodwill impairment and indicators of overpayment. The findings of Zining *et al.*'s (2011) study suggests that when the acquisition price is higher than the book value and an overpayment occurs, this excess relates strongly to subsequent impairment losses. Similarly, Gu and Lev (2011) investigated the causes of goodwill impairments and documented a strong association between share overpricing and subsequent acquisition intensity on the one hand, and goodwill growth on the other. Based on their results, Gu and Lev (2011) argue that goodwill impairments potentially arise from overpriced shares at acquisition. They conclude that goodwill write-offs can be an indicator of a dysfunctional investment strategy.

2.3.4.3 CEO tenure and compensation

AbuGhazaleh *et al.* (2011) studied the discretion used by management in goodwill reporting. This discretion could lead to opportunistic reporting or the provision of private information. Their results confirmed that managers do exercise discretion in reporting goodwill impairments. Possible reasons listed by AbuGhazaleh *et al.* (2011) for such impairments were income smoothing, recent CEO changes and a need for a way to convey private information on future cash flows.

Masters-Stout *et al.* (2008) show that CEOs tend to recognise goodwill impairments in the early years of their appointment. The first reason may be that these impairments can then be blamed on the previous CEO. A second reason may be to make future earnings look better (the 'big bath' strategy). Thirdly, such a move could be due to new management's evaluating CGUs more objectively, which could result in goodwill impairments. Masters-Stout *et al.*'s (2008) results proving that newly appointed CEOs are more inclined to impair goodwill than their predecessors confirm that the accounting rules regarding impairments are applied in different ways by different CEOs. The finding highlights the need for more guidance from the accounting policy-makers regarding the application of the accounting standards.

Jordan *et al.* (2007) also provide further evidence of the ‘big bath’ effect, suggesting that firms recognised large goodwill impairments during the year when *SFAS no. 142* was adopted and in years in which the earnings were already depressed. Moreover, the recognition of goodwill impairments could have an effect on a CEOs compensation, and as a result, proper management discretion may be compromised.

A study by Darrough, Guler, and Wang (2014) investigated whether CEOs face a decrease in their compensation if they recognise goodwill impairment. They distinguished between firms that are more R&D intensive, and ones that are less R&D intensive. As Masters-Stout *et al.* (2008) did, Darrough *et al.* (2014) focused on CEO tenure, hypothesising that a decrease in CEO compensation would not be different for CEOs with longer tenure than for CEOs with shorter tenure. They found that CEOs in firms that are not R&D intensive experienced a reduction in their option-based compensation when goodwill impairments were recognised. By contrast, it seems that CEOs in firms that are R&D intensive are shielded in terms of option-based compensation when goodwill impairments are reported. However, all CEOs experienced a significant reduction in their cash-based compensation (Darrough *et al.*, 2014). The findings also suggest that CEOs with a long tenure and those with a shorter one are subject to different compensation treatment: the compensation of CEOs with a long tenure appears to be shielded when goodwill impairment is recognised.

Another study on the compensation packages of CEOs and the influence of goodwill recognitions was conducted by Detzen and Zülch (2012). They hypothesised, based on agency theory, that managers may account for a business combination opportunistically by recognising goodwill in excess of its economic determinants. Detzen and Zülch (2012) show that with increasing cash bonus intensity, managers tend to recognise more goodwill, especially when cash bonuses are between 150% and 200% of a manager’s base salary prior to the acquisition.

Gros and Koch (2015) found that a change in key management, such as a new CEO, is associated with discretionary goodwill impairment losses. Glaum, Landsman, and Wyrwa (2018) also found that firms are more likely to impair goodwill if there was a change in CEO in the current year. More specifically, they found that the probability that a firm in their sample would write off goodwill was almost 50% higher if there was a CEO change.

The determinants of goodwill impairment decisions include the effect of firms' operating in high enforcement countries, where good corporate governance may have an impact. Therefore, corporate governance as a determinant of goodwill impairment is discussed next.

2.3.4.4 Corporate governance

A study by Glaum *et al.* (2018) investigated the determinants of goodwill impairment decisions for a sample of firms from 21 countries, enabling them to draw a comparison between low and high enforcement countries. Their findings showed that goodwill impairments tend to be timely for firms in high enforcement countries. Therefore, firms in high enforcement countries are more responsive to declines in the economic value of their assets, and report the impairments in a timely manner. However, firms in low enforcement countries are less responsive to economic indicators when they determine whether goodwill should be impaired.

Verriest and Gaeremynck (2009) also investigated determinants of goodwill impairments and included firms in their sample that were expected to have goodwill impairment activities. They selected firms whose book value of equity minus the market value was smaller than the amount of recognised goodwill. In their preliminary findings, Verriest and Gaeremynck (2009) noted that only 53% of the firms in the sample did indeed recognise impairment. The study aimed to determine whether variables such as ownership concentration, corporate governance quality and firm performance provided incentives for management to impair goodwill. The results indicated that better performing firms and firms with stronger corporate governance mechanisms were more likely to impair the firm's goodwill.

Not all firms adhere to proper corporate governance principles, which are governed less strictly in some countries. This was an important aspect often overlooked in studies (especially single country studies) that simply assume that corporate governance mechanisms are functioning efficiently. As Glaum *et al.* (2018) confirmed, the enforcement systems of various countries do have an effect on the timeliness of goodwill impairment decisions. South Africa is known to be on the forefront of sound corporate governance practices (Clayton *et al.*, 2015), and therefore the present study's sample provides a setting where good corporate mechanisms should be in

place. In this setting, it is possible to test whether corporate governance influences the impairment of goodwill.

2.3.4.5 Merger and acquisition activities

AbuGhazaleh *et al.* (2011) used merger activities as a proxy for goodwill impairment, based on the assumption that when a firm actively engages in mergers and acquisitions, it is likely to report more goodwill, and more subsequent impairments. Impairments can be the result of prior unprofitable acquisitions if a decrease in the carrying value of goodwill is offset by additions of goodwill during a particular year (AbuGhazaleh *et al.*, 2011). Goodwill impairment is likely to be an outcome of suboptimal decisions made at the time of acquisition (Darrough *et al.*, 2014). According to IAS 36, managers must review goodwill immediately after the acquisition date, which may encourage managers to disclose impaired goodwill sooner.

2.3.4.6 Size of a firm and prior profitability

Firms with poor profitability reported in a prior year may indicate a possible decline in prospective growth rates. This influences the fair value estimation of goodwill and subsequently its impairment. AbuGhazaleh *et al.* (2011) found that the poorer a firm's past performance, the greater the magnitude of its impairment losses would be.

Xu *et al.* (2011) found that better performing firms are penalised for impairments more heavily by market participants, as measured by the share value at the time of impairments. Goodwill charges are therefore interpreted differently, depending on the financial status of a firm.

In summary, a number of reasons have been documented as to why goodwill impairments arise, including research to determine the underlying economic reasons for goodwill impairment. One aspect that the present study investigates the determinants of goodwill impairment. Once a firm decides to impair its goodwill, it needs to disclose certain information in terms of IAS 36. In the present study, firms are assigned a goodwill impairment disclosure score to determine the effect of the goodwill impairment test-related disclosure. In the next section, studies that investigated the quality of goodwill impairment disclosure are therefore discussed.

2.3.5 Reasons disclosed for goodwill impairment

IAS 36 requires companies to disclose why goodwill impairment has occurred. This implies that each time any goodwill impairment occurs, a company is compelled to account for the events that led to that impairment. Hence, even though goodwill impairment is subject to a number of calculations and assumptions, its disclosure is also a product of how it is written up in a firm's annual financial statements. Because of the nature of goodwill impairment, which is often seen in a negative light, management needs to respond to anticipated critical evaluations from financial analysts, shareholders and the public. Plausible and acceptable explanations may be needed to retain, or sometimes even regain, organisational and managerial legitimacy (Sandell & Svensson, 2017). If no explanation of the goodwill impairment is given, the impairment may be considered a failure, so some reason for it is required.

The explanations provided for goodwill impairment may be a single sentence or longer paragraphs. Sandell and Svensson (2017) investigated how the reasons for a goodwill impairment may be constructed rhetorically in annual reports – they studied the ways these reasons were presented in the reports of a sample of Swedish firms. The analysis of these accounts used in their study is based on an older study performed by Scott and Lyman (1968).

The objective of the present study is to align the underlying reasons for goodwill impairments with the explanation strategies adopted (the various ways in which reasons are provided) by management for impairing goodwill in the annual reports. To examine the explanations of the reasons provided by management, the categories formulated by Scott and Lyman (1968) and Sandell and Svensson (2017) are adapted in the present study:

- *Excuse:*

An excuse is made when a company admits that the event or the act is negative or wrong, but simultaneously denies responsibility for the act (Scott & Lyman, 1968). The company thus states that goodwill impairment occurred because of factors beyond the company's control. The classification of the account as an excuse does not imply that the company is lying: it merely indicates that, according to the company, the event was caused by something outside the company. Excuses do not necessarily have substantial explanatory value, and may indeed

simply be an indication of what happened in the market. For example, there may have been a change in the company's customer base, which in turn changed the company's future prospects. Excuses can also refer to more extraordinary circumstances, such as an accident or unanticipated events. Sandell and Svensson (2017) used a fire as example. In such an event, the impairment of goodwill is the effect of something that management could not have foreseen or controlled.

- *Justification:*

In a justification, management admits responsibility for the event, but denies the negative effects of the event (Scott & Lyman, 1968). With reference to goodwill impairment, it is common for management to refer to its positive intentions or the outcome expected, based on normal business activities (Sandell & Svensson, 2017). For example, an oil and gas company included in Sandell and Svensson's (2017) sample referred to 'exploration' to justify its goodwill impairment. This company argued that the acquisition of assets for exploration and prospecting necessarily involves some degree of risk. Hence, management was aware that some acquisitions were bound to fail, and deemed such failures to be a normal part of normal business activities. Justification can also occur if management minimises or denies any damage that has been done. Phrases such as 'as expected' or 'as previously reported' may be present in the annual financial reports.

- *Refocusing:*

When the reader's attention is redirected towards a different issue or event, the rhetorical strategy employed is known as refocusing. The focus can also be redirected from the present to either the past or the future (Sandell & Svensson, 2017). An example of refocusing is a shift of the focus from the actual problem towards a proposed solution, changing a possible negative sentiment to a positive one. Management uses refocusing to try to show how it will regain control of the negative events.

- *Concession:*

A concession is an acknowledgement of guilt, taking full or partial responsibility for the event (Sandell & Svensson, 2017). According to Edwards (2005), the rhetorical strategy of concessions in accounts has increased significantly in recent years, both in corporate and political communication. It could be that management

believes that the market will have a more positive perception of information if the company acknowledges the event as soon as possible. Synergy effects are a common reason for recognising goodwill at the point of acquisition. A concession for goodwill impairment may state that the expected synergies have not been realised, which indicates that the initial calculation of goodwill was based on incorrect assumptions.

- *Mystification:*

With mystifications, an attempt is made to neutralise the event by providing a vague, or sometimes even an incomprehensible account (Sandell & Svensson, 2017). No explanation is provided to the reader, as even more confusion is added to the account of the negative event. A study by Li (2008) found that the annual reports of poorly performing companies are often more difficult to read and to interpret than those of successful companies. Hence poor performance seems to be obfuscated in less readable reports, while success allows for clarity (Sandell & Svensson, 2017). An example is an annual report that provides a general or abstract formulation, instead of more precise and concrete information. Alternatively, the information on a negative event may be unexpectedly provided in a section of the financial report where readers are likely not to look for the needed information.

- *Wordification:*

Wordifications refer to a type of account very similar to mystification. It does not add any new or substantial information to what is already known to elaborate on why the impairment occurred (Sandell & Svensson, 2017). Words and repetitions are given as an account, but do not really explain anything. This can also happen if accounting language is translated into natural language, obfuscating more than clarifying; for example, the numerical components used to calculate goodwill impairment may be presented in natural language.

- *Silence:*

Silence refers to the strategy of completely withholding any comment from management on impairment and the reasons for it. The absence of comments could create a situation where readers can interpret the reasons for impairment in many different ways. Sandell and Svensson (2017) point out that the reader might contemplate why management is silent on this particular matter, but the reader is

still left to mere speculation. Is management not aware of the requirements of the relevant IFRS, or do not they know the reasons for the goodwill impairment? Sandell and Svensson (2017) are of the opinion that silence is a performative act that could postpone controversies, sustain suspicions and reproduce mysteries.

Amiraslani *et al.* (2013) found that the majority of firms in their sample appeared to be box-ticking their way through the compliance process. The reasons provided for goodwill impairment were often given using an excess of boilerplate language, which implies compliance through restatements of wording contained in *IAS 36*. There were, however, some firms that provided disclosures on the nature of and reasoning underlying their judgements in determining goodwill impairment. Given that the extent of box-ticking of *IAS 36* is a problem, overall compliance may appear high, but this may obscure low levels of compliance in areas where managerial discretion is required (Amiraslani *et al.*, 2013).

In their review of the goodwill impairment disclosure literature, Carvalho, Rodrigues, and Ferreira (2016) also found that a significant number of disclosures on goodwill were nothing more than a repetition of the paragraphs prescribed in *IAS 36*, and indicated a complete lack of effort by companies to report on their specific situation. This could result in disclosures that are not informative and have little usefulness for the purposes of financial statements.

Compliance should therefore not be assessed only on whether the minimum requirements prescribed by *IAS 36* are met. The present study thus undertakes a closer inspection of the nature and extent of disclosures based on the assumptions made by management and the circumstances considered. As Carvalho *et al.* (2016) recommend, the disclosure index used in the present study assigns different weightings to the mandated disclosure items to ensure that the index captures the quality of disclosures as accurately as possible.

2.4 GOODWILL IMPAIRMENT DISCLOSURE

2.4.1 The importance of quality goodwill impairment disclosure

Annual reports are becoming increasingly voluminous, covering both financial and non-financial information, as well as a vast amount of other disclosures in the notes to

the financial statements. This amount of detail can result in the provision of too much information, and makes reports costly to prepare. It is therefore important to differentiate between what information is value adding, and what information is perceived to obscure relevant information (Johansen & Plenborg, 2013). Varying levels of compliance with *IFRS 3* and *IAS 36* can have an impact on investors' abilities to estimate the amount, timing and uncertainty of an entity's future cash flows across firms better (Mazzi, André, Dionysiou, & Tsalavoutas, 2017). According to paragraph 16 of *IAS 1* (IASB, 2003), financial statements should not be described as complying with IFRS unless they actually comply with all the requirements of each applicable standard. Previous studies have, however, found that firms are inconsistent in applying the requirements set out in *IAS 36*, which can result in uncertainty amongst market participants (Andreicovici *et al.*, 2020). Wang (2018) points out that compliance with the accounting standards, including all the disclosure requirements, is the key to accounting quality. If the importance of compliance with disclosure requirements in any accounting standard is understood, it can lead to better prediction of firms' overall performance (Khairi *et al.*, 2012), but such compliance may be costly.

Johansen and Plenborg (2013) assessed the balance between preparation costs and user satisfaction, relative to user demand. They conducted a survey incorporating responses from users of financial reports with an investment focus, as well as responses from preparers of annual reports. The sample contained Danish firms, which are required to comply with IFRS, making the results generalizable to a wider context. Of all the components in the annual report, the financial statements were found to be the most important component. Johansen and Plenborg's (2013) results suggest that the notes to the financial statements are deemed the second most important, but were only marginally more important than the management commentary. Users regarded the auditor's report and statement of directors' responsibilities as the least important components in the annual report. This particular set of surveys received very high response rates. With specific reference to *IFRS 3*, the study found that the notes to the financial statements are strongly demanded, but also that users were not satisfied with the notes. This could pose a risk to the preparers of financial reports, because users demand forward-looking information, which is the type of information on which the fair value of goodwill is based. It is therefore important to focus on ways in which these disclosures could be improved. Furthermore, because

they are costly to prepare, the preparers are of the opinion that disclosure requirements should either be reduced, or that the disclosure should be improved (Johansen & Plenborg, 2013).

Some accounting standards allow for voluntary compliance, which refers to the disclosure of an item that is not required. However, compliance is mandatory if the item must be reported in the financial reports of a firm in accordance with legal or financial reporting requirements. Mandatory compliance enhances transparency, accountability, uniformity and comparability, which assists users of the information in their decision-making (Khairi *et al.*, 2012). The disclosure requirements in accordance with *IFRS 3* and *IAS 36* are mandatory; therefore, in the present study, the term 'disclosure' refers to the mandatory requirements governed by these accounting standards.

As D'Alauro (2013) explains, disclosure of impairment can be seen as a test to determine the faithfulness with which firms conduct their impairment testing. D'Alauro (2013) found a positive correlation between the level of impairment test disclosure and the magnitude of goodwill impairment. However, Kabir *et al.* (2017) found that firms with understated goodwill impairment losses have higher goodwill impairment disclosure, suggesting that disclosures are used to enhance the credibility of the impairment when the loss that has been recognised is in fact understated.

A recent study by Andreicovici *et al.* (2020) investigated the transparency of the goodwill impairment disclosure of European companies between 2006 and 2014. Their study was aimed at determining the usefulness of goodwill impairment test disclosures to analysts. The findings revealed that more transparent discount-rate disclosure, and disclosing the exact rate(s) used in discounting the expected future cash flows led to lower analyst disagreement. However, cash flow disclosures did not necessarily convey useful information to market participants. Andreicovici *et al.* (2020) conclude that many European firms are not necessarily providing high levels of quality disclosure, but are merely box-ticking the requirements of *IAS 36*.

2.4.2 The quality of goodwill impairment disclosure

As Johansen and Plenborg (2013) showed, users of financial reports do demand quality disclosure in terms of *IFRS 3* and related standards. To determine whether the

quality of goodwill impairment disclosure improves firm value, the present study assigns a disclosure compliance score based on the *IAS 36* requirements for each firm year observation. It is therefore important to understand the disclosure requirements governed by *IAS 36*, and then to determine whether firms are following these requirements.

Gurarda (2015) investigated the disclosure quality of Turkish firms for the period from 2008 to 2012, deliberately including the global financial crisis period (2008 to 2009). Based on his relatively small sample, he found that in 2008 that only eight out of 27 firms provided effective disclosure regarding the method they used for the goodwill impairment test. The disclosure improved marginally in 2009, and improved each year from then to 2012. According to *IAS 36*, firms need to disclose whether they use the value in use or fair value method. Furthermore, assumptions such as discount rates, growth rates, cash flow assumptions, and risk sensitivity analysis need to be disclosed (Gurarda, 2015). Gurarda (2015) found that during the financial crisis period, some firms used low discount rates, which resulted in overestimated cash flow projections. This could indicate that firms might want to avoid potential goodwill impairment in order to protect their stock value. The discount rates used after this period still remained relatively low and the information about the period of cash flows was vague. Another concerning finding was that in the budget assumption firms used periods of more than five years without justification – the standard specifically requires justification if a period longer than five year is. Gurarda (2015) concludes that these Turkish firms did not provide the kind of high-quality disclosure as required by *IFRS 3*, which could in turn have a negative impact on firm value.

Similar results were reported for a sample of Singaporean firms in a study by Khairi *et al.* (2012). Their study investigated disclosure quality and the compliance level with *IAS 36*. They found that 90% of the sampled firms failed to comply with the most basic elements of *IAS 36* pertaining to goodwill impairment testing. The authors ascribed the finding to lack of experience, since the then new *IAS 36* introduced a high degree of complexity and detail. Khairi *et al.* (2012) were of the opinion that the situation would improve over time. The present study focuses on a period after the implementation of *IFRS 3*, which should eliminate lack of experience in implementing the new accounting standards as a factor to consider.

Another external factor which could have had an influence on the adoption of *IFRS 3* was the global financial crisis. Using a very short sample period of four years, Bepari, Rahman, and Mollik (2014) examined the impact of the global financial crisis on the quality of disclosure of Australian firms. They performed a review of the disclosure notes in companies' annual reports and calculated an aggregate compliance score based on the disclosure requirements set out in *IAS 36*. The association between compliance with *IAS 36* and firm size, leverage, profitability, different industries, goodwill intensity and audit quality were investigated. Bepari *et al.* (2014) determined that compliance was higher during the global financial crisis (2008 and 2009) than in the years before that (2006 and 2007). Contrary to the findings in Gurarda's (2015) study, these results suggest that firms may provide more disclosure when there is greater investor demand for transparency regarding goodwill impairment decisions. Specifically, if firms have large goodwill balances and goodwill impairments, and if litigation risks are high, the quality of disclosure will improve (Bepari *et al.*, 2014). The findings also confirmed that neither firm size nor leverage was a significant indicator of *IAS 36* compliance. However, there was evidence that more profitable firms had higher compliance levels for goodwill impairment testing. Bepari *et al.* (2014) suggest that this may be because the actual goodwill impairment calculation was based on future cash flows, associating profitability with present and future cash flows. It is therefore probable that a profitable firm may find it more comfortable to comply with goodwill impairment testing than firms with low levels of profit. This, together with high compliance in the global financial period, may suggest that profitable firms wanted to signal to the market that the underlying economic value of goodwill has not been impaired by the adverse market conditions (Bepari *et al.*, 2014). Industry did appear to have an impact on goodwill impairment disclosure – certain industries may lend themselves to higher goodwill intensity, which would lead to an increase in goodwill impairment. Whether goodwill intensive firms provided better quality of disclosure was tested, they were indeed found to do so for the global financial crisis period, but they did not do so in the years before that. As a final test, Bepari *et al.* (2014) wanted to determine whether being audited by Big4 auditors (Ernst & Young, Deloitte & Touche, KPMG and PricewaterhouseCoopers) versus non-Big4 auditors was associated with a higher level of compliance, and the results revealed that this was indeed true. To summarise, Bepari *et al.* (2014) presented evidence that *IFRS 3* compliance increased

during the global financial crisis period and was associated with goodwill intensity, audit quality and profitability.

D'Alauro (2013) also used a short period (2006 to 2008) with the aim of investigating the initial impact of *IAS 36* in the first years of its application. D'Alauro (2013) included both Italian and British companies to establish the impact of *IAS 36* in countries with significantly different accounting traditions. As was noted earlier regarding Caruso *et al.* (2016), Italian legislation allows the option of choosing between impairment and amortisation, whereas British companies are all required to test annually for impairment. However, against expectation, the disclosure quality was no better for British firms than for Italian firms. On the other hand, D'Alauro (2013) did present evidence of a significant disclosure improvement with reference to the last observed year (2008), indicating that firms are improving in their disclosure quality as they become more accustomed to the requirements of *IAS 36*. Furthermore, his results indicated that impairment disclosure was negatively influenced, firstly, by managers' decision to avoid goodwill write-offs despite market indications of impairment, and, secondly, where there was a decrease in corporate accounting disclosure. Studies performed on data of only one period, or from a limited time series, do not allow for proper analysis of the evolution of compliance with disclosures over time (Carvalho *et al.*, 2016). A longer sample period could thus provide more robust results with regard to the quality of disclosure, which should be achieved with the present study's sample period (2006 to 2017).

A recent study was performed by Boučková (2016) on European firms, with the aim of determining whether companies with higher goodwill intensity disclose the information required by *IFRS 3* on goodwill impairment. Goodwill intensity was determined by looking at a firm's goodwill in relation to its total assets. Based on the requirements set out in *IAS 36*, Boučková (2016) measured the compliance levels of firms according to nine requirements: (i) the allocation of goodwill to CGUs; (ii) the key assumptions by management; (iii) the determination of the recoverable amount; (iv) the period of the projected cash flow; (v) the determination of the growth rate; (vi) the growth rate used to extrapolate the cash flow projections; (vii) the discount rate for each CGU; (viii) the determination of the discount rate; and (ix) sensitive analysis regarding key assumptions. Of the 33 companies examined by Boučková (2016) in 2014, only six

complied with all nine requirements, 11 complied with seven to eight requirements, and 16 with fewer than six requirements. This worrisome result indicates that the compliance with *IAS 36* disclosure requirements is still very low. Accordingly, the possible advantages of *IAS 36* are severely limited by firms' failure to comply with the disclosure requirements (Boučková, 2016).

Low compliance in the disclosure of goodwill impairment as required by *IAS 36* can be ascribed to various factors. Firstly, as Johansen and Plenborg (2013) have shown, it may be too costly to comply fully. Secondly, companies may want to protect themselves in difficult economic periods by prolonging goodwill impairments (Gurarda, 2015). Thirdly, preparers may believe that some of the disclosure requirements force them to disclose potentially sensitive proprietary information (Mazzi *et al.*, 2017). A fourth possible reason may be that firms do not fully comprehend the potential benefits of quality disclosure.

In their study, Mazzi *et al.* (2017) assumed that increased levels of corporate disclosure may lead to a decrease in the cost of equity because of a reduction in the estimation risk. The sample size of Mazzi *et al.*'s (2017) study was more representative than that in Boučková's (2016) study, as they observed 214 firms, and, improving on Boučková's (2016) study, they used a questionnaire on the compliance of *IFRS 3* and *IAS 36* consisting of 50 items. In addition, since there were some revisions to *IFRS 3* and *IAS 36* in July 2009, there were some changes in the mandatory disclosure requirements. To account for these different requirements Mazzi *et al.* (2017) prepared two different questionnaires, one for 2009 and preceding periods, and one for 2010 and after. The findings of their study revealed a high degree of variation in compliance levels with items that provide proprietary information and management judgements and expectations. Companies that do comply in respect of these items benefit from a lower implied cost of equity capital (Mazzi *et al.*, 2017). Robust evidence was presented that compliance levels with goodwill-related disclosure requirements are negatively associated with the cost of equity capital, but only when firms did not meet the market's expectations. Mazzi *et al.* (2017) interpreted this as proof that increased levels of these disclosures mitigated estimation risk, as the market seeks additional information through goodwill-related disclosures. The riskier firms did not meet the market's expectations, but instead surprised the market with sudden impairments.

There have been a number of studies on the quality of goodwill disclosure, but only a limited number of studies have been performed on South African data. The firms included in the samples of the above-mentioned studies all comply with IFRS, but country-specific influences may have an effect on results. One South African study investigating the level of goodwill impairment disclosure compliance of JSE-listed firms for the 2018 financial year end was performed by Day (2020). The sample consisted of 83 South African firms with goodwill balances exceeding 1% of the value of their total assets. The overall level of compliance was assessed to be poor, despite the fact that the sampled firms had material goodwill balances. Variables such as the growth rate and the discount rate were omitted from the disclosure by the majority of the firms included in the sample. The *IAS 36* requirement with which compliance was weakest was the disclosure of the key assumptions used to determine the cash flow projections. This requirement is often deemed the most useful information by users and is readily accessible to the preparers, hence it is one of the key indicators of the quality of goodwill impairment disclosure. However, the study performed by Day (2020) only covered one year, whereas the present study covers a period of 12 years: 2006 to 2017.

2.5 POSSIBLE CHANGES TO THE ACCOUNTING OF GOODWILL

The adoption of *IFRS 3* and *IAS 36* was aimed at harmonising international accounting and improving the quality of information transmitted in the financial statements. This was done in order to achieve faithful representation and greater usefulness of financial statements (Amorós Martínez & Caveró Rubio, 2018). However, various problems have been identified by researchers.

Impairment testing requires variables that may be subjective and ambiguous because of a lack of clarity of certain applications (AbuGhazaleh *et al.*, 2011; Beatty & Weber, 2006; Wines *et al.*, 2007). Some authors showed that some firms failed to disclose information as required by *IAS 36* regarding how they performed impairment testing (Carlin & Finch, 2010, 2011; D'Alauro, 2013; Glaum *et al.*, 2013). Findings from an interview-based study by KPMG (2014) found that the degree of subjectivity in goodwill impairment testing is limiting its effectiveness. The high number of judgements and assumptions embedded in *IAS 36* makes goodwill impairment testing a complex and time-consuming exercise.

Problems such as the ones noted above have generated some doubts among regulators regarding the current standards and have led to talk of reincorporating systematic amortisation (Amorós Martínez & Caveró Rubio, 2018). The IASB has published an update about its deliberations on goodwill and its impairment research project. This update followed feedback from the post-implementation review of *IFRS 3*, with the aim of making improvements to *IFRS 3* and *IAS 36*. The discussion paper was published in March 2020, and sets out the Board's preliminary views on disclosure of information and accounting for goodwill (IASB, 2020). Amongst other things, the IASB has decided to pursue the objective of simplifying the accounting of goodwill and intends to explore whether to reintroduce the amortisation of goodwill. The implication of this discussion is that, in future, firms will be able to decide whether to use the impairment method or the amortisation method. In light of this, Amorós Martínez and Caveró Rubio (2018) have analysed the economic consequences of the application of one method over the other. They compared two periods, the periods prior to and after the introduction of *IFRS 3*. The results revealed that the application of either of these methods affects the financial statements and the usefulness of the information. Therefore, implementing one or the other could distort the quality and comparability of the information transmitted by firms (Amorós Martínez & Caveró Rubio, 2018).

The IASB research forum 2017 is evaluating the effects of introducing more principles of disclosure as part of the IASB disclosure initiative (Hellman, Carenys, & Moya Gutierrez, 2018). Based on this initiative, Hellman *et al.* (2018) performed a literature review on how companies have complied with disclosure indexes in the past. They found that the degree of compliance depends on entities' incentives for providing or withholding information. Hellman *et al.* (2018) argue that there is increased reliance on entities' acting in good faith when complying with disclosure requirements. When they design the standards and formulate the requirements, enforcers must clearly distinguish between compliance and non-compliance. The high-level principles of disclosure in terms of *IFRS 3* may be useful, but more appropriate specific requirements that logically support the principles should be designed (Hellman *et al.*, 2018). Recommendations from KPMG (2014) study include simplifying the accounting model if the cost of compliance is too high and if goodwill impairment testing is not value relevant. This can be achieved by writing off goodwill immediately, or amortising goodwill over a capped period. However, in support of impairment-related disclosures,

it should be determined whether the current level of disclosures is indeed warranted (KPMG, 2014). It is therefore important that regulators ensure that the disclosure requirements are both enforceable and auditable. This will secure at least a minimum level of disclosure.

In the present study, a detailed analysis is performed on the value relevance of goodwill and impairments after the introduction of *IFRS 3*. The quality of goodwill impairment disclosure is what distinguishes the new accounting standards from the ones prior to *IFRS 3*. Goodwill impairment test-related disclosure should result in more comprehensive financial information, which could have a positive impact on the value relevance of goodwill. If this is found to be true, it could reassure managers that using the impairment method is useful.

2.6 CONCLUSION

This chapter has examined the prior literature on goodwill and its impairment. With the aim of increasing the comparability between the financial statements of entities applying US GAAP and those applying IFRS, the IASB issued *IFRS 3* to move towards international convergence (Jerman & Manzin, 2008). Based on *SFAS no. 142*, the IASB introduced *IFRS 3* in March 2004, replacing the old accounting standard, *IAS 22*, which governed business combinations. The main change with regard to goodwill was that it no longer needs to be amortised over its useful life, but that firms should test for annual impairment under *IAS 36*. Improvements to the accounting standards, combined with sound corporate governance mechanisms, should improve the reliability and relevance of accounting records. Also, aspiring to future alignment of US GAAP and IFRS, this move by the FASB and IASB respectively could promote international convergence.

In terms of *IAS 36*, management discretion must be used to calculate CGUs' recoverable amount. This includes future projections of cash flows based on a reasonable growth rate, together with an appropriate discount rate. All these variables are based on estimates, projections and management perceptions of future performance. Because of the subjectivity of management in determining the value of fair value of goodwill, there is a possibility of manipulation and possible agency costs (Ferramosca *et al.*, 2017; Gu & Lev, 2011). *IAS 36* also requires financial statements

to include proper disclosure of the impairment testing and variables used. Given the high level of corporate governance that South African firms must adhere to, the JSE provides the ideal setting for the present study to investigate the underlying reasons for goodwill impairment.

There are a number of documented underlying reasons for goodwill impairment, such as CEO tenure (Jordan *et al.*, 2007; Masters-Stout *et al.*, 2008), earnings management (Lee & Yoon, 2012; Ramanna & Watts, 2012), overpayment for target firms (Ramanna & Watts, 2012; Zining *et al.*, 2011), merger and acquisition activities (AbuGhazaleh *et al.*, 2011), prior profitability (AbuGhazaleh *et al.*, 2011) and corporate governance mechanisms (Beatty & Weber, 2006; Verriest & Gaeremynck, 2009). These reasons all suggest the possibility of a level of manipulation by management with regard to goodwill impairments.

IAS 36 requires management to report the reasons for a goodwill impairment recognised in a particular year. However, it is likely that most managers would prefer not to admit to the reasons listed above and instead disclose a reason that shareholders might find more palatable. Based on the kinds of explanations that managers offer that have been identified from the literature, the present study investigates the actual reasons for goodwill impairment, as well as the reported reasons disclosed in the financial statements. Management can give different reasons to explain goodwill impairment in annual reports. The taxonomy of accounting for goodwill impairment is based on work conducted by Scott and Lyman (1968) and Sandell and Svensson (2017). The different forms of explanation strategies to give reasons for goodwill impairments are excuses, justifications, refocusing, concessions, mystification, wordification and silence.

Omitted disclosure (non-compliance with accounting standards) may lead to biased estimations (Mazzi *et al.*, 2017). For this reason, more research is needed to explore the quality of disclosure and the level of compliance. For a certain period after the adoption of *IFRS 3*, a large number of studies focused on goodwill in settings prior to and after the introduction of *IFRS 3*. The implementation of *IFRS 3* created an ideal setting for research on the various determinants and effects of goodwill impairment. Only recently have studies been undertaken to address the quality of goodwill impairment disclosure as made available by firms for use by external parties. A

number of studies found that firms do not comply fully with goodwill impairment disclosure (Boučková, 2016; Gurarda, 2015) even though investors demand it (Johansen & Plenborg, 2013). Not only is disclosure required by investors, but it has a positive association with profitability and audit quality. Goodwill impairment, although it is essentially a negative economic event, does provide informative insights into an organisation and could contribute to investors' decision-making.

The quality of disclosure, in the form of the detailed reasons provided to explain goodwill impairments, as well as the variables used in the impairment calculation, could assist shareholders to value an entity. Hence, firms with a better quality of goodwill impairment disclosure in the financial statements could be more value relevant than firms with disclosure of poorer quality. One of the objectives of the present study is thus to determine the effect of goodwill impairment disclosure on firm value. Because of the similarity of the requirements in *IAS 36* (IFRS) and *SFAS no. 142* (US GAAP), the results of the present study (which are based on IFRS standards) could also be applied by firms following US GAAP.

In view of the proposed changes to IFRS, that will allow both impairment and amortisation (IASB, 2020), the present study aims to provide insight into the value relevance of goodwill impairment disclosure. This could be vital information for standard setters, investors and managers for future decision-making.

CHAPTER 3: THE VALUE RELEVANCE OF GOODWILL

3.1 INTRODUCTION

This chapter firstly discusses value relevance and general value relevance research, with the aim of determining whether goodwill and subsequent impairments are used by equity investors to determine firm value. This is followed by a review of value relevance literature with specific focus on goodwill, the impairment of goodwill and the quality of disclosure of goodwill impairments in annual reports.

One of the objectives of financial reporting is to provide investors with relevant information to enable them to estimate company value. Value relevance studies are aimed at determining whether that specific objective is met. An accounting amount is value relevant if it has a predicted significant relation to share prices, but only if it reflects information that is relevant to investors in valuing the firm, and can be measured reliably enough to be reflected in the share prices (Barth, Beaver, & Landsman, 2001). The primary purpose for performing value relevance studies is to build knowledge regarding the relevance and reliability of accounting amounts as reflected in equity values (Barth, Beaver, & Landsman, 2001).

One of the objectives of the IASB is to ensure that accounting standards promote relevant and reliable information. As Barth, Beaver, and Landsman (2001:80) explain, 'an accounting amount is relevant if it is capable of making a difference in financial statements users' decisions and reliable if it represents what it purports to represent'. In an earlier study, Ball and Brown (1968) found that financial reporting information in general is correlated with the market values of firms and that it is used for valuation purposes. It is, however, important to consider whether a particular item, be it the amount or its disclosure in the financial statements, is in fact used to determine company value, otherwise it cannot be labelled 'value relevant'. If it is not used in this way, the financial reporting does not meet this key objective, namely to provide value relevant information.

3.2 VALUE RELEVANCE RESEARCH

3.2.1 General valuation versus value relevance research

General valuation attempts to determine a firm's *intrinsic* value. The intrinsic ('real') value of a firm is not necessarily its book or market value, but rather the value that investors attach to a firm when investors perform valuation processes based on their views.

By contrast, value *relevance* can be defined as the ability of financial statement information to capture and summarise information that determines a firm's value (Beisland, 2009). This implies that value relevance studies are designed to evaluate whether a particular accounting amount reflects information that is indeed used by investors when those investors want to value a firm's equity, not to estimate firm value (Barth, Beaver, & Landsman, 2001). Therefore value relevance studies aim to determine whether the particular financial information under question is used by equity investors to determine a firm's fair value (not a firm's intrinsic value). However, the validity of value relevance research rests on its interaction with the broader valuation literature. It is therefore important to ensure that the particular financial information (in the present study, goodwill) is incorporated when one is determining the intrinsic value of a firm.

A comprehensive study investigating the various methods of valuing a firm was conducted by Fernández (2007). According to Fernández (2007), of all the available methods, the most suitable method is to discount expected future cash flows. The free cash flow method assumes that a firm will continue to operate in the foreseeable future, and the method arises from the firm's capacity to generate cash (flows) for its equity's owners. Therefore, if free cash flow valuations are correlated with market values, so is the accounting information contained in the valuation.

According to Beisland (2009), traditional financial theory states that the theoretical value of a company's equity is the present value of all future dividends or free cash flows to equity. Therefore, if an item in the financial reports is included in a firm's free cash flow calculation, it can be used to determine firm value and can be deemed value relevant. The free cash flow of a firm reflects the expected future cash flows from operations, after adjusting for expected fixed asset investment and working capital

requirements (Fernández, 2007). Goodwill, which is classified as a non-current asset, is therefore included in any changes in fixed asset investment. Moreover, when the fair value of goodwill is determined (which is done annually as part of the impairment testing requirements set out in *IAS 36*), future expected cash flow from every CGU is used. The CGU's future cash flow is part of the firm's total expected future cash flow, and it is therefore included in the firm's total free cash flow. It is thus evident that goodwill is included in the calculation of a firm's free cash flow, which is included in the valuation process.

3.2.2 Value relevance of financial information

According to Beisland (2009), the aim of value relevance literature is to determine whether equity investors use particular accounting information to estimate firm value. If they are not using that accounting information, equity investors are likely to receive information that they use to determine firm value from elsewhere. It is therefore evident that value relevance is not only important for equity investors, but also for standard setters such as the FASB and IASB. Barth, Beaver, and Landsman (2001) argue that many research questions formulated in value relevance studies arise because of broad questions raised by non-academic stakeholders. Academic research does not necessarily provide specific policy recommendations, but it can provide fruitful insights for accounting standard-setting. The aim of the value relevance literature is thus to provide research findings on the relevance and reliability of accounting information for investors' use.

The IASB welcomed comments to its discussion paper, *A Review of the Conceptual Framework for Financial Reporting*, released in July 2013. Bauer *et al.*'s (2014) study contributed to this discussion, and argue that the IASB should revisit the reliability and prudence concepts to address the inherent accounting problem of moral hazard by ensuring third-party verification of reporting. This hazard arises because firms are required to communicate information to the public by means of financial reporting, but the information may be perceived to present a credibility problem. The IASB should therefore address this credibility problem by ensuring prudence, reliability and conservatism. Prudence refers to a firm's ability to account only for assets whose value will be realised, such as impairing overstated goodwill.

In a study performed by KPMG (2014), stakeholders from different backgrounds and geographic regions were interviewed to gain insight into their perceptions. The KPMG (2014) study was performed to elicit perceptions so that KPMG could provide informed comments to the IASB on the value of goodwill impairment testing in financial reporting for market participants. Findings from this study revealed that goodwill impairment testing is value relevant in assessing how well an investment has performed; however, the relevance of goodwill impairment testing to the market relates to its confirmative rather than its predictive value. Moreover, the degree of subjectivity embedded in goodwill impairment testing limits its effectiveness, because the judgements and assumptions required by management make goodwill impairment testing a complex exercise. Some of the interviewees were of the opinion that the level of impairment-related disclosures was excessive, and others were in favour of even more disclosure.

Different accounting standards lead to different information in the process of valuation by stock analysts (Beisland, 2009; Lee & Yoon, 2012). More complex accounting standards could have a smaller impact on the equity value of a firm, if investors and analysts do not fully comprehend the information supplied in terms of a particular accounting standard. Evidence of this was presented by Whitwell *et al.* (2007), who assessed how investors value intangible assets, which is known to be complex and difficult to measure. However, if financial information is presented in a coherent manner, giving the reader sufficient insight into an organisation, it may increase the relevance of the accounting information. KPMG's (2014) study found that analysts prefer to receive enhanced disclosure about goodwill impairment. Also, analysts seem to be frustrated by the lack of consistency between the test-related disclosures of various firms, because inconsistency compromises the comparability of information from different firms.

Value relevance studies aim to examine the association between accounting amounts and equity market values to establish whether accounting amounts can explain any variation in share prices (Barth, Beaver, & Landsman, 2001). In their study, Barth, Beaver, and Landsman (2001) examined how well accounting amounts reflect information used by equity investors. Not all accounting numbers in the financial statements are new information, but numbers need to be presented and explained in such a way that the information is relevant for equity investors. Value relevance is

therefore not necessarily decision-relevant, as there might be more timely information available. The focus of value relevance is also not an attempt to estimate intrinsic firm value, which is an objective of fundamental analysis research (Barth, Beaver, & Landsman, 2001).

Holthausen and Watts (2001) critically evaluated the standard-setting inferences that can be drawn from value relevance research. The scope of their study was not limited to standard setting, but also gave insight into value relevance studies in general. A concern raised by Holthausen and Watts (2001) regarding value relevance research is that it assumes that all assets are separable and saleable, which threatens the creditability of such research, because some assets are intangible: there are no active markets for acquiring intangible assets and these assets are not separable from the firm. Another concern was raised by Mazzi *et al.* (2017), who noted that scholars often make the false assumption that companies comply fully with disclosure regulations (hence, the present study tests compliance with test-related disclosures mandated by IAS 36 to determine whether companies do comply with the requirements).

Based on the goodwill impairment literature discussed in Chapter 2, there is a potential risk that firms may overstate goodwill if they delay goodwill impairment. Overstated goodwill could lead to inflated asset values, which could in turn lead stock analysts temporarily to overvalue companies. Whitwell *et al.* (2007) evaluated the accuracy of stock analysts' assessments of intangible assets. Their findings suggest that stock analysts do not fully comprehend the value relevance and wealth generation capability of intangible assets, and therefore often omit these assets from assessments and when they make recommendations. If that happens, valuations are performed ignoring the value of intangible assets. These omissions may be the result of an incomplete understanding of the accounting treatment of intangible assets, or of analysts' not fully relying on the accounting reports presented by firms. If the latter reason applies, this situation could be improved if firms provided better quality disclosure and more reliable accounting information.

Ji and Lu (2014) found that the value relevance of goodwill is higher in firms with more reliable information on intangible assets. These findings suggest that if firms can improve the value reliability of information on intangible assets, assessments by stock analysts would improve, making intangible assets more value relevant. This could

ensure that analysts do not exclude intangible assets when they determine a firm's value. Li and Sloan (2015) agree that stock analysts often experience difficulties in goodwill valuation, because they fail to comprehend that overstated goodwill and deteriorating operating profits will result in future impairments. By simply ignoring intangible assets in firm valuation, a significant increase in goodwill may be overlooked. This, together with deteriorating profits, is one of the key indicators of possible goodwill impairment. If investors comprehend the association between large goodwill balances and deteriorating profits, this additional information could assist them in their decision-making. As indicated above, KPMG's (2014) study shows that the goodwill impairment charges do not appear to act as a key signalling event for the market, and their value relevance is in confirming rather than predicting value. These findings suggest that the current accounting model could potentially be adjusted to make it easier for investors to comprehend and interpret financial statement information on goodwill.

Specifically focusing on investor analysis, Huefner and Largay III (2004) list a number of factors that investors should be wary about with regard to goodwill accounting in accordance with *IFRS 3*. Firstly, investors should note that firms with goodwill balances are likely to report higher net income after the adoption of *IFRS 3*, because of the abolition of amortisation and discretionary write-offs of goodwill. This, together with lower asset balances, should result in an overall increase of value indicators, such as return on assets (ROA) and return on equity. Secondly, subsequent higher reported income would result in the improvement of ratios such as the times interest earned, with no improved cash flow coverage. Lastly, Huefner and Largay III (2004) note that lower asset balances as a result of goodwill write-offs increased debt ratios, which could send unfavourable signals, and could have resulted in their sample firms' being incorrectly valued during the *IFRS 3* adoption period. This possibility was overlooked by several researchers who attempted to determine the effect of value during this period.

The data used in the present study cover the period after the initial adoption of *IFRS 3*, but also periods where amendments were made to the goodwill accounting standards (July 2009). These changes were not material, and were merely designed to align goodwill accounting with US GAAP.

Investors are often concerned with the possibility of creative earnings management, and with good reason. The potential risk of earnings management is embedded in goodwill impairments calculations, which could influence the value relevance of the accounting information. To shed some light on this phenomenon, Marquardt and Wiedman (2004) investigated whether opportunistic earnings management has an adverse effect on the value relevance of accounting information, as reflected in stock prices. Their study was structured to investigate two types of firms, namely firms where stocks were sold in periods of secondary equity offerings, and firms that did not participate in secondary offerings. For firms that sold their stocks in secondary offerings and voluntarily disclosed an earnings forecast, no earnings management or decreased value relevance of earnings were found. However, for firms that did not disclose earnings forecasts, evidence was found of both significant earnings management and decreased value relevance of earnings (Marquardt & Wiedman, 2004). It is therefore evident that if earnings cannot be relied on, the value relevance of earnings loses its credibility. It should also be considered whether other elements, such as accrual accounting, have value relevance for investors.

Hung (2000) examined the value relevance of accrual accounting in 21 countries. The results suggested that in countries with effective corporate governance mechanisms, accrual accounting is value relevant. His study was based on the argument that managers can act more opportunistically in an environment where there are weak corporate governance mechanisms. Hung (2000) argues that managers who act opportunistically may manipulate accounting numbers for personal gain, which makes accounting information less value relevant. Good corporate governance is therefore vital to ensure that shareholders are protected and that accounting information can be relied upon.

In the vast amount of research performed on value relevance, various valuation methods have been used to determine whether financial information is value relevant. According to Holthausen and Watts (2001), many valuation models omit important factors and do not provide links between valuation model inputs and accounting numbers. The selection of an appropriate valuation model in value relevance research is therefore of vital importance. One method often used in value relevance literature is the Ohlson (1995) model, sometimes with refinements. This model represents firm

value as a linear function of the book value of equity and the present value of abnormal future earnings; it is based on accounting earnings and equity book value. The Ohlson (1995) model assumes perfect and complete capital markets, but it does permit imperfect product markets for a finite number of periods. Some concern has been expressed that this valuation model is a linear, rather than nonlinear model (Holthausen & Watts, 2001). However, although the equity value represents a linear function, the abnormal earnings are entered into the model nonlinearly. Hence, marginal differences in abnormal earnings are not associated with constant differences in equity book value. Modifications are often made to the model in order to incorporate the potential effects of nonlinearities.

An example of such a study is one performed by Swartz, Swartz, and Firer (2006). They used the original Ohlson (1995) model, adjusted for an intellectual capital variable. Swartz *et al.* (2006) aimed to investigate the relevance of accrual accounting data and intellectual capital in determining share prices. Their results indicate that abnormal earnings, abnormal dividends, the net book value of assets and intellectual capital provide relevant information in directing market prices in an emerging market.

3.2.3 Value relevance of goodwill before and after the adoption of IFRS 3

Holthausen and Watts (2001) have raised the concern that, under the amortisation regime, goodwill was not revised periodically and could therefore not be deemed value relevant. However, with the adoption of IFRS 3, management is required to test goodwill for impairment annually. A study considering two accounting regimes was performed by Chalmers, Clinch, and Godfrey (2008). The first regime they looked at was GAAP, in which goodwill was amortised, and IFRS was the second regime, in which amortisation was removed and replaced with annual impairment testing. Chalmers *et al.* (2008) investigated identifiable intangible assets (such as patents or brand names) and goodwill separately. Their reason for separating identifiable assets from goodwill was the difference in the accounting rules applicable to the two types of intangibles (identifiable and non-identifiable), although the overall aim of Chalmers *et al.*'s (2008) study was to determine the value relevance of intangible assets. They found that the information content of goodwill under the IFRS 3 regime provided more value relevant information than that under the GAAP regime. However, this was not true for identifiable intangible assets. Chalmers *et al.* (2008) conclude that with the

elimination of a mechanical straight-line amortisation approach, *IFRS 3* now provides more value relevant information. Therefore the financial reports gained information with regard to goodwill, but lost some information in respect of identifiable intangible assets (Chalmers *et al.*, 2008). The setting of the study by Chalmers *et al.* (2008) was the one year when both GAAP and IFRS measures were disclosed in the audited financial statements. Because their study was done in the first year after the adoption of *IFRS 3*, the timing may have had an effect on the way analysts valued a firm, given that some may not yet have fully comprehended the *IFRS 3*-required information. Hence, the present study incorporates a 12-year period after the adoption of *IFRS 3* to ensure that a longitudinal analysis of goodwill can be performed. Using the 12-year period after *IFRS 3* adoption implies that investors will have developed an accurate understanding of what the accounting standard entails.

Bugeja and Gallery (2006) examined whether the value-relevance of purchased goodwill holds as goodwill ages. Their study included a sample of Australian firms over the period from 1995 to 1999; thus, the study focuses on a pre-*IFRS 3* setting. The results suggest that recently acquired goodwill has information content, while older goodwill does not. There seems to be underlying differentiation in investors' valuation on the basis of the age of goodwill (Bugeja & Gallery, 2006).

In the period after the introduction of *IFRS 3*, entities cannot simply record goodwill year after year without determining whether it still meet the criteria of an asset. Each year, the goodwill of each CGU needs to be investigated and the firm has to confirm that the goodwill is reflected at its recoverable amount. This could result in goodwill's retaining its value relevance under *IFRS 3* even when goodwill ages. A study by Bepari and Mollik (2017) contradicts the findings of Bugeja and Gallery (2006), where the former researchers provide evidence that the regime change for goodwill accounting has improved the information content of goodwill, in that the value relevance of goodwill does not decline as goodwill ages. In line with the findings of Chalmers *et al.* (2011), Bepari and Mollik (2017) provide evidence that the impairment regime enables firms with higher (lower) investment opportunities to maintain (reduce) the goodwill balances that are related to their economic investment opportunities. Managers can use this opportunity under the impairment regime to improve the alignment of goodwill reporting with the underlying economic attributes of goodwill (Bepari & Mollik, 2017).

However, under the amortisation regime, the market assumed that the remaining goodwill balances had lost their value relevance, because the figures no longer represented the underlying economic value of goodwill (Bepari & Mollik, 2017; Ravlic, 2003).

Bugeja and Loyeung (2015) examined the proportion of the purchase price allocated to goodwill during an acquisition, using data collected from mergers and acquisitions in Australia between 1998 and 2012. Of all these acquisitions, 42% of acquirers recorded a nil amount for goodwill. However, the findings suggest that the amount allocated to goodwill increased after Australia adopted *IFRS 3* (Bugeja and Loyeung (2015). Another Australian study by Dahmash, Durand, and Watson (2009) examined the relevance and reliability of reported goodwill and identifiable intangible assets under Australian GAAP from 1994 to 2003. A key feature of the intangible assets standards under Australian GAAP was that firms had to amortise recognised goodwill over a period not exceeding 20 years. The Australian Accounting Standards Board (AASB) introduced *AASB 138 Intangible assets*, which is similar to *IAS 36*, only after the period considered in Dahmash *et al.*'s (2009) study. The evidence provided by Dahmash *et al.* (2009) indicates that information presented in respect of goodwill and intangible assets in the period from 1994 to 2003 was value relevant, but was not reliable. Dahmash *et al.* (2009) specifically examined both the value relevance and reliability, because they argue that an accounting standard can be value relevant even if the information provided is not necessarily reliable, and also noted that even though goodwill was found to be value relevant, it was reported too conservatively. However, the change to *IFRS* from GAAP is likely to reduce the level of bias with which goodwill is reported.

As Bauer *et al.* (2014) have shown, audited financial statements are not a timely source of information. The cost of speed is reliability, and users who require information for decision-making often use alternative sources. However, audited financial statements are still perceived as a complementary source of information. Managers are less likely to behave imprudently or to misreport financial information if the financial statements are independently verified (Bauer *et al.*, 2014).

A study performed on the value relevance of intangible assets prior to the introduction of *IFRS 3* was undertaken by Choi, Kwon, and Lobo (2000). In their study, they

examined the relationship between the reported value of intangible assets, the associated amortisation expense and the firm's market value. A significant positive relationship was found between firm value and reported goodwill, but the market participants' valuation of intangible assets was lower than their valuation of tangible assets. Choi *et al.* (2000) also noted that the market did not interpret the amortisation expense negatively, even though they viewed it differently from other expenses. Choi *et al.* (2000) argue that either the market does not regard goodwill as a wasting asset, or recorded amortisation expense reflects the decline in value with a considerable margin of error. Based on their empirical results that the amortisation expense is not significantly related to stock returns, Choi *et al.* (2000) suggest that the GAAP requirement of the reduction of the reported income by goodwill amortisation is not supported by their results. Studies such as this added to the debate of whether reported goodwill is reliable and accurate.

The adoption of *IFRS 3* and *IAS 36* was supposed to improve the accuracy and reliability of reported goodwill. The essence of *IAS 36* is the requirement that management must perform annual impairment testing on recognised goodwill, which relies heavily on management discretion and perceptions of the future performance of a particular CGU. The use of discretion by management in determining goodwill impairments may be why some researchers found that, before the adoption of *IFRS 3*, reported goodwill was more value relevant, since it was less reliant on managerial assessments and possible manipulation (Bens *et al.*, 2011; Hamberg & Beisland, 2014; Ji & Lu, 2014). However, Ji and Lu's (2014) findings suggest that, even though value relevance declined in the post-adoption period, the positive relationship between value relevance and value reliability has remained unchanged. This finding suggests that if management reports reliable information on its recognised goodwill, the impact on firm value could improve.

The calculation of goodwill is based on fair value estimates. Therefore, no active market exists for goodwill. Estimations are based on management discretion and there is a risk of estimation errors, whether intentional or unintentional. Some studies have attempted to address the question of whether fair value estimates are reliable (Barth & Clinch, 1998; Higson, 1998). These studies found that the estimates used by management did reflect the values of the assets reliably and that using managerial

discretion in determining fair values does not eliminate the value relevance of intangible assets. It is likely that after the adoption of *IAS 36*, the level of managerial discretion increased, because the fair value calculation has to be performed annually, and not just at the initial recognition. With this in mind, the question is whether the subsequent recognition of goodwill is reliable under the *IFRS 3* regime.

Aharony, Barniv, and Falk (2010) focused on European firms. The European Union made *IFRS* mandatory for all publicly traded firms, beginning from the fiscal year ending in December 2005. Prior to this, European firms followed their own national accounting systems. The European Union therefore provided an ideal setting to investigate the impact on firm value that arises from adopting new accounting standards. Aharony *et al.* (2010) considered three accounting information items, namely goodwill, R&D expenses, and asset valuations. With reference to goodwill, their results suggest that investors benefited from all three accounting items under scrutiny after adopting *IFRS*.

Further evidence on the value reliability of goodwill was presented by Hamberg and Beisland (2014). Comparing the period prior to the adoption of *IFRS 3* and the period after its adoption, they found that amortisations were not value relevant prior to *IFRS 3*. However, impairments during that period were value relevant, confirming that the value reliability of goodwill is important for capital market participants. Hamberg and Beisland (2014) found, however, that after the adoption of *IFRS 3*, stock returns were no longer statistically related to reported goodwill impairments. This could indicate that goodwill impairment is a result of agency-cost incentives and not necessarily the operating performance of a CGU. It could suggest that market participants are not sure whether they can rely on the managerial discretion applied.

To shed light on the problem of whether the managerial discretion embedded in goodwill impairment decisions is value relevant, Horton and Serafeim (2010) investigated the transition of UK firms from UK GAAP to *IFRS* in 2005, as European law required all UK firms to adopt the new *IFRS* consolidated accounts at that time. They classified all UK firms in terms of the timing of their reconciliation disclosure. The first category of firms was those firms that delayed disclosure until their first interim report, or alternatively made it with other important announcements. The second category of firms was those who released their reconciling report earlier and

separately from other important announcements. Horton and Serafeim (2010) argue that the latter group (the separate disclosure firms) should be used to assess the effects of a pure accounting change, as the market should have already reacted to the firm performance when the annual results were published. Their findings suggest that the goodwill impairment disclosure of separate disclosure firms was significantly associated with abnormal returns around the day of the disclosure. These results are consistent with the notion that the market perceives a write-off associated with a change in an accounting principle less negatively than a write-off associated with a decline in the fair value of recognised goodwill.

A number of studies have presented evidence that after the adoption of *IFRS 3*, goodwill has become more value relevant (Chalmers *et al.*, 2012; Eloff & De Villiers, 2015; Kimbro & Xu, 2016). In their study, Chalmers *et al.* (2012) investigated whether Australian firms lost potentially useful information conveyed in goodwill after the implementation of *IFRS 3*. The findings suggest that the impairment approach to goodwill recognition as required by *IFRS 3* resulted in more useful information than when the former approach to goodwill was followed. It is unclear whether this implies that investors do rely on managerial discretion. Similar results in a South African study conducted by Eloff and De Villiers (2015) suggest that goodwill reporting, according to *IFRS 3*, provides more value relevant information. Capital market participants seem to base their determination of share value on the information at their disposal, and there is a stronger positive association between share prices and goodwill in the period after *IFRS 3* was adopted. Eloff and De Villiers (2015) raise the possibility that goodwill may have become even more value relevant after yet another amendment to *IFRS 3* in 2009. This latest amendment gives more guidance on the application of the acquisitions method in business combinations. This should make the reported goodwill more comparable between different companies. This factor was not, however, considered in their study, as the data sample included only 2001 to 2009 (to address this lacuna in their study, the period after the latest amendment (after 2009) is included in the present study).

The studies listed above did not differentiate between firms with high levels of disclosure quality, and those with lower levels of disclosure quality. The present study does make this distinction by assigning a test-related disclosure score to each firm, as

information disclosed by firms with better disclosure quality is likely to be more value relevant, because of the reliability of the reporting.

Kimbro and Xu (2016) investigated the impact of the information content of goodwill on market analysts' assessments. They investigated the relationship between goodwill and future returns by considering the effect of goodwill on idiosyncratic return volatility in a setting after the adoption of *IFRS 3*. One objective of Kimbro and Xu's (2016) study was to determine whether the information content of goodwill has improved since the introduction of *IFRS 3* and has consequently reduced information risk. Their evidence shows that the annual impairment testing of goodwill regime improved the informativeness and value relevance of goodwill significantly. This then results in an environment with a more efficient market pricing of risk. It is therefore expected that goodwill impairments could have an effect on share value assessment by market participants. This may then be seen as an incentive for managers to improve reporting quality.

It is not only the reporting quality that can improve shareholder's assessment of goodwill, but also the announcement of the goodwill impairment. Investors only know that a firm is impairing goodwill if the firm announces this event. Goodwill impairment may be expected by market participants, but only the actual announcement that it has occurred can confirm those expectations. Zining *et al.* (2011) therefore investigated the market reaction to goodwill impairment announcements. Their US-based study looked at three periods, namely the period prior to *SFAS no. 142*, the transition period, and the period after the adoption of *SFAS no. 142*. For all three periods, they found that the market adjusted its expectations downwards after such an announcement. During the period after the adoption of *SFAS no. 142*, the negative impact on market reaction was the lowest, but it was still significant. Zining *et al.* (2011) attribute this finding to losses' being reported occurring more frequently after the adoption of *SFAS no. 142*, but losses' being lower in magnitude. Based on these findings, Zining *et al.* (2011) conclude that market participants perceive the announcement of goodwill impairments as negative information about the firm.

Goodwill has become more value relevant since the adoption of *IFRS 3* – clearly because of the information content embodied in the reported goodwill and subsequent

impairment (Chalmers *et al.*, 2012; Eloff & De Villiers, 2015; Kimbro & Xu, 2016; Zining *et al.*, 2011).

Horton and Serafeim (2010) investigated the market reaction to and value relevance of mandatory transitions as required by *IFRS 3*. They selected accounting standards to investigate based on those that differed significantly between GAAP and IFRS. One of the selected accounting standards was goodwill, because the accounting requirements of *IFRS 3* changed significantly from GAAP. Horton and Serafeim's (2010) results suggest that goodwill impairments are not only incrementally value-relevant but also reveal new information about the particular firm.

Value relevance research on goodwill can therefore be expanded by investigating the value relevance of the impairment of goodwill, which is one of the objectives of the present study.

3.2.4 Value relevance of goodwill impairment

Goodwill impairment can only be relevant when managers disclose detailed information in the financial statements regarding the assumptions made about future cash flows and provide reliable information to investors (Schatt, Doukakis, Bessieux-Ollier, & Walliser, 2016). Schatt *et al.* (2016) compiled a detailed literature review on the association between goodwill impairment and investors' expectations of future cash flows. It seems that investors do not always deem the information on goodwill impairments useful, since investors can revise their expectations based on public information. Another reason may be that investors do not find the financial information and additional notes on the impairment test reliable (Schatt *et al.*, 2016). This finding implies that it is important for managers to ensure high quality of disclosure to equip investors with ample information.

Andreicovici *et al.* (2020) posit that the high level of information asymmetry and information uncertainty related to goodwill impairment implies that goodwill impairment should have an effect on analysts' interpretation of a firm. However, if managers use their discretion opportunistically to manipulate the amount of recognised goodwill impairment, the resulting disclosure is unlikely to be informative. Therefore, opportunistic goodwill impairment recognition increases the noise in the information

communicated through disclosure, and may limit the usefulness for analysts (Andreicovici *et al.*, 2020).

Focusing on whether goodwill impairments resulted in improving or decreasing the usefulness of goodwill from an investor's perspective, Guler (2018) determined that in his sample, goodwill balances were more strongly associated with firm value after SFAS no. 142 than before SFAS no. 142. Guler (2018) investigated a sample of firms over the period from 1999 to 2005 to enable a comparison of the association before and after the adoption of SFAS no. 142. The sample firms' recognition of goodwill impairments were classified based on whether goodwill impairment was written off when expected, avoided, or recognised even if there was no indication of impairment. Guler (2018) calculated the MTB ratio for each sample firm. Where the MTB was less than one, a goodwill impairment was expected, but if a firm did not recognise the impairment, this suggested that the firm had avoided an impairment. If the MTB was greater than one but a firm did recognise an impairment, it did so without an indication of possible impairment. Guler (2018) found that the association between firm value and goodwill was lower for firms that avoided the recognition of goodwill impairments. The difference in the results between the categories of goodwill impairment recognition suggests that investors adjust for reliability differences. Another finding of Guler's (2018) study is that goodwill impairments are negatively associated with firm value where managers have more discretion in the impairment testing process. According to Ramanna and Watts (2012), as the number and size of CGUs increases, there is room for unverifiable fair value-based discretion. Even with the concerns surrounding managerial discretion embedded in goodwill impairment, Guler's (2018) findings show that the impairment regime results in goodwill impairment's being more value relevant than under the amortisation regime.

Xu *et al.* (2011) investigated goodwill impairment announcements made by well-known entities. Firms often highlight that goodwill impairments are non-cash charges which do not impact their ability to operate their business, make strategic investment decisions or pay dividends. However, the presence of goodwill impairments does reflect on the performance of investments, as the impairment is an indication that the goodwill was overvalued. Xu *et al.* (2011) justify their study by emphasising that if markets were efficient, stock prices would already have incorporated information about

the impairment. Conversely, if an impairment reveals new or additional information, a price reaction will result. Their total sample of firms was divided into subsamples based on their profitability, as they posited that valuations may differ for profit and loss firms. The findings of Xu *et al.*'s (2011) study suggest that firms that generate profits were penalized by investors if goodwill impairments are recognised. This was also true for firms that emphasised that the impairment was a non-cash write-off. However, for firms with operating losses, the reaction of investors was not as negative, and could indicate that impairments were regarded as a sign of imminent change for these firms. Xu *et al.* (2011) conclude that goodwill impairment is perceived as relevant information, but that the signal conveyed is moderated by a firm's profitability. It is therefore important to examine goodwill on an annual basis and disclose all relevant information.

As Ritter and Wells (2006) explain, if accounting practices in respect of intangible assets are transparent, they are likely to enhance value relevance, as long as investors are able to interpret the disclosures. Similarly, the findings of a study by Andreicovici *et al.* (2020) suggest that if disclosure relating to goodwill impairment tests is more transparent, the disagreement between analysts and managers (and disagreement between analysts) is significantly lower.

3.2.5 Goodwill and subsequent impairment disclosure

Goodwill impairment may not have any cash flow implications, but it does have a negative effect on net income. As a result of management's discretion in determining the subjective discounted cash flow estimates, there is a high level of information asymmetry and information uncertainty related to goodwill impairment. This implies that when they decide to provide information on goodwill impairment tests, this enables managers to convey private information to analysts and give them insight into the judgements and estimates that affected the impairment process (Andreicovici *et al.*, 2020). If goodwill impairment disclosure is informative, it could help analysts to form their opinions of a firm from a financial perspective. However, opportunistic goodwill impairment increases the noise in the information communicated through disclosure, and constrains the usefulness of information for analysts (Andreicovici *et al.*, 2020).

Lang and Lundholm (1996) examined differences between the disclosure practices of firms, the number of analysts following the disclosures and the properties of the

analysts' earnings forecasts. The results from their study confirmed some valuable advantages of using proper disclosure in financial reporting. Firstly, it results in a greater analyst following, and secondly, it results in greater consensus between analysts' earnings forecasts. Lastly, it leads to more accurate forecasting and fewer variable forecast revisions. Accurate forecasting and fewer forecast revisions enable analysts to reduce their costs in following a firm. Lang and Lundholm (1996) also confirm analysts possess both firm-provided and privately acquired information, and that moreover any increases in disclosure and its timeliness enhance the weight placed on firm-provided information. Similar findings were presented by Barth, Kasznik, and McNichols (2001), who found that firms with more precise disclosures, as measured in financial analysts' ratings, have higher analyst coverage. Therefore, high quality disclosure could potentially improve analyst following.

Hayn and Hughes (2006) investigated whether the available disclosure in financial reports allows investors to predict goodwill impairments. Their study examined firms that reported goodwill impairments before the issuance of *SFAS no. 142*. The findings from this study suggest that the characteristics of the original acquisition were more powerful predictors of the goodwill impairments than those based on segment disclosure of the acquired firm's performance. Hayn and Hughes (2006) conclude that the available disclosure did not provide investors with enough information to predict goodwill impairments. As this study was conducted prior to *SFAS no. 142*, it should be noted that annual impairment testing of goodwill was not a requirement. Because of the differences between the requirements under *IAS 22* and *IFRS 3*, the essence of 'goodwill impairment' is different in these two regimes. The level of disclosure and reporting required under *IFRS 3* is much more comprehensive, and could benefit users of the financial statements.

A detailed literature review on the evolution of accounting standards for goodwill accounting and reporting was performed by Wen and Moehrle (2016). They reported mixed results on whether goodwill impairments after the implementation of *IFRS 3* are informative for users of financial statements. Wen and Moehrle (2016) summarise three factors related to goodwill impairments: (i) whether the firm has low or high information asymmetry; (ii) the cost associated with conducting an impairment test; and (iii) the prior performance of the firm. The recognition and disclosure of goodwill

impairment therefore depends on the size, information asymmetry and prior performance of a firm. These factors are also taken into consideration when analysts determine the value of firm. In this context it is also worth considering Andreicovici *et al.*'s (2020) finding that both disclosure transparency relating to the impairment timing and the amount shape analysts' opinions. The managerial discretion embedded in goodwill impairment could also result in agency costs.

Ferramosca *et al.* (2017) based their study on the agency theory, and investigated whether and how salient external auditor characteristics affect the reported goodwill impairment. Their study was based on the perception that auditors prefer more conservative goodwill and earnings values, because they will reduce litigation and reputation costs. These findings are consistent with this notion, showing that Big4 auditors constrain goodwill impairments, but are not associated with goodwill impairment overstatements. Goodwill impairment overstatements were associated with lower audit fees, because such overstatements resulted in more conservative assets and earnings estimates. Ferramosca *et al.* (2017) highlight the risk that leniently audited discretionary fair value estimates could compromise the role of auditing. This risk can be mitigated if standard setters enforce more disclosure from firms, and by auditors. Such disclosures should include impairment test-related disclosure, such as the methods used, the time horizon and discount rates used by the firms in compiling the financial statements, and the auditing procedures followed by the auditors to verify these variables.

The IAS 36 impairment tests allow significant unverifiable estimates, which increase the likelihood of managerial manipulation (D'Alauro, 2013). With this risk in mind, the IASB has deliberately included a high level of disclosure requirements in the framework of IAS 36. Firms are required to disclose detailed information regarding the fair value calculation of goodwill, regardless of whether goodwill is impaired during the given year. This degree of disclosure could mitigate the risk of managerial discretion, and it could provide investors with assurance that financial reports prepared under IAS 36 are reliable.

Amiraslani *et al.* (2013) investigated the judgements made by European companies in their IFRS compliance on policy disclosures relating to various assets, including goodwill. The majority of the sample firms did provide a relevant policy note, but

variations in the depth of disclosure were found. Amiraslani *et al.* (2013) suggest that the relative materiality of impairment positions can influence compliance attitudes.

Al Jifri and Citron (2009) found that the goodwill disclosed in the notes by firms engaged in R&D activities, has the same degree of explanatory power as recognised goodwill. Their study shows that if the market treats the recognition of goodwill and its disclosure equally, it may be beneficial to smaller investors, who may be less capable of determining the implications of goodwill note disclosures for market value. They also found that investors deemed information provided as part of impairment testing disclosure to be value relevant, confirming that the decision to move from annual amortisation was correct. Al Jifri and Citron (2009) point out that both the recognised goodwill amount and the test-related disclosures can be used to explain market values. Therefore, market participants take into account the value of goodwill, as well as the accompanying disclosures, in their decision-making.

Similarly, André, Dionysiou, and Tsalavoutas (2018) found that the market values of firms that provided proprietary information and revealed management judgements and expectations increased. For these firms, their study found that analysts make less dispersed forecasts of the firms' market value. Therefore, it seems that mandatory disclosures provide insight into key accounting areas and judgements, which increases the transparency of financial statements.

Kabir *et al.* (2017) examined a different association, namely that between the goodwill impairment loss and the goodwill impairment test-related disclosures. The disclosure of goodwill impairment methods used is a requirement in terms of *IAS 36*. Kabir *et al.*'s (2017) study firstly aimed to determine whether firms with understated goodwill impairment losses disclose more goodwill impairment test-related information to enhance the credibility of the impairment recognised than firms with expected goodwill impairment losses. Secondly, Kabir *et al.* (2017) wanted to establish whether firms provide less information so that investors cannot identify the understated impairment figure. Thirdly, their paper addressed the question of whether goodwill impairment test-related disclosures signal the quality of the goodwill impairment loss figure in the Statement of Comprehensive Income. Similar to previous studies (e.g. by Filip *et al.*, 2015; Ramanna & Watts, 2012), they calculated the MTB value. If the MTB was less than 1 with no goodwill impairment, they deemed it to indicate that goodwill impairment

was understated. Their results confirmed that firms with understated goodwill impairment losses made greater goodwill impairment test-related disclosures. However, they could not find evidence that the value relevance of goodwill impairment was dependent on the impairment test-related disclosures.

A recent study investigating the level of compliance with mandatory disclosure concerning the impairment of goodwill and its determinants was performed by Devalle, Rizzato, and Pisoni (2017). This study on Italian data found a low level of compliance with the disclosure requirements of *IAS 36*. The results suggested that the size of goodwill, whether goodwill was impaired, and the size of the firm were all positively associated with the mandatory disclosure required by *IAS 36*. The present study aims to make a contribution to existing knowledge by expanding Devalle *et al.*'s (2017) study and determining whether more comprehensive disclosure of goodwill impairments has a greater effect on firm value, as opposed to less comprehensive disclosure.

In an earlier study, Beekes and Brown (2006) investigated whether corporate governance quality is related to the information flow of a company and whether these two variables are value relevant. They considered the number of price-sensitive documents released to the share market, analysts' EPS forecasts and the speed at which share prices reflect the value relevant information embedded in the share price. Their findings suggest that better-governed firms make more informative disclosures. These firms were also found to have a larger analyst following, and analysts' consensus forecasts for better governed firms were less biased and more accurate. Beekes and Brown (2006) conclude that value-relevant information about better governed firms is timelier because the price discovery is faster.

3.3 CONCLUSION AND FORMULATION OF THE HYPOTHESES

Value relevance studies assess whether particular accounting amounts are used by investors to value firms' equity. By contrast, general valuation research focuses on the valuation methods used to determine firm value. These two fields of valuation research are intertwined, as an accounting amount cannot be value relevant if it is not used in the calculation of firm value. Goodwill is used in the free cash flow calculation, which is seen as the most suitable method to value a firm (Fernández, 2007). The annual

calculation of goodwill's fair value under the new accounting regimes takes into consideration the future cash flows of a CGU, which in itself is part of a firm's overall free cash flow calculation. It is therefore appropriate to determine whether goodwill and subsequent impairments are value relevant.

As discussed above, Barth, Beaver, and Landsman (2001) found that value relevance studies are valuable for the setting of accounting standards. The accounting treatment of goodwill is perceived as controversial, and hence, various questions have been asked. One is whether goodwill is a true reflection of the financial position of a firm and is not manipulated by management (AbuGhazaleh *et al.*, 2011; Carlin & Finch, 2010; Hamberg & Beisland, 2014). Another is whether market participants comprehend goodwill (Whitwell *et al.*, 2007; Zining *et al.*, 2011). In terms of *IFRS 3* (or *SFAS no. 142* for US-based studies), management is required to determine annually whether goodwill has impaired or not. If goodwill is impaired, it must be written off and reported as a goodwill impairment expense. The IASB were of the opinion that this amendment to the goodwill accounting standard would be beneficial. The amended standard reflects the true value of goodwill better, and the impairments can be used by market participants to predict future cash flows more accurately (Bostwick *et al.*, 2016).

The question of whether goodwill has become more value relevant after the most recent accounting change has been answered to some extent. Bugeja and Gallery (2006), Chalmers *et al.* (2012), Eloff and De Villiers (2015) and Kimbro and Xu (2016) all found evidence that goodwill reporting after the implantation of *SFAS no. 142* or *IFRS 3* has become more relevant. However, Bens *et al.* (2011) and Hamberg and Beisland (2014) presented contrary evidence that goodwill under the new reporting regime has not improved the value relevance of goodwill.

As noted above, various studies have been performed to determine the value relevance of goodwill prior to and after the implementation of *IFRS 3* (or *SFAS no. 142*). The information content of goodwill has also been explored and the reasons underlying these impairments has been investigated. Various reasons have been investigated regarding whether and why management might delay goodwill impairments. Jordan *et al.* (2007) and Masters-Stout *et al.* (2008) have provided evidence that goodwill impairment may be delayed mainly as a result of earnings

management (in terms of the ‘big bath’ theory). Gu and Lev (2011) concluded that goodwill impairments arise from the overpayment of target firms. Verriest and Gaeremynck (2009) found that firms with strong corporate governance mechanisms were more likely to impair than to delay impairments intentionally.

Another reason which was identified in previous studies (Beatty & Weber, 2006; Jordan *et al.*, 2007) was the decision to recognise the impairment as an expense below the net profit for the year because of a change in an accounting standard: if a firm recognises goodwill impairments during the year of adoption of *IAS 36*, the accounting guidelines allow the firm to show goodwill impairment below the net profit for that particular year. This reason will not apply in the present study, because the study period commences two years after the adoption of *IAS 36* in 2004.⁴ The study period does however, include 2008 and 2009, a recession period, which had an effect on the global economy and thus also on the South African economy.

A number of past studies have reported on the underlying reasons for goodwill impairments (AbuGhazaleh *et al.*, 2011; Bens *et al.*, 2011; Carlin & Finch, 2010; Masters-Stout *et al.*, 2008), but the effects of these goodwill impairment and its disclosure have yet to be explored. Previous studies have investigated the quality and informativeness of disclosure required by *IAS 36* (Devalle *et al.*, 2017; Kabir *et al.*, 2017). The present study aims to contribute to the existing literature and determine whether the disclosure of goodwill impairment as required by *IAS 36* could explain share value, using South Africa, as a leader in corporate governance (Du Toit, 2017), as the ideal setting to investigate the impact that goodwill impairment disclosure has on firm value.

The aim of the present study is to determine the value relevance of goodwill and of its impairment. Furthermore, the value relevance of goodwill impairment disclosure is investigated, introducing a novel element that distinguished this study from previous studies. Firms are categorised based on the quality of their disclosure by assigning a disclosure compliance score. As Boennen and Glaum (2014) point out, the industry that a firm operates in seems to have an effect on its level of compliance with

⁴ *IAS 36* was adopted in 2004 and the present study’s period commenced two years later in 2006.

accounting standards. The present study therefore analyses the results per industry to contribute further to the existing literature.

South African is an ideal setting for this study because the corporate governance mechanisms required in South African firms are of a high standard. The long study period (2006-2017) should result in more comprehensive results. The study period covers the period after the adoption of *IFRS 3*, when, as already indicated, the managers and users of annual financial statements should already be accustomed to the specific requirements governed by the goodwill accounting standards. This ensures that the value relevance of goodwill and subsequent impairments can be determined within a context where the accounting standards are already comprehensible to the various users.

Based on the discussion above, the hypotheses were developed as set out below. Each hypothesis is followed by an explanation of the rationale for the hypothesis.

Hypothesis 1 (H₁):

Goodwill, as accounted for in accordance with IFRS 3, is value relevant.

With the adoption of *IFRS 3*, goodwill is more coherent and the reliability and relevance of the financial information surrounding goodwill are higher than prior to the adoption of *IFRS 3*. The present study incorporates a longer study period after the adoption of *IFRS 3* than most of the prior studies, in a country where good corporate governance mechanisms and the legal system encourage reliable and relevant financial information.

Hypothesis 2 (H₂):

There are statistically significant determinants of goodwill impairment decisions.

IAS 36 requires firms to test for impairment annually or when indicators of possible impairment are present. Management should disclose detailed information surrounding the goodwill impairment calculation and any assumptions management used. However, there might be underlying reasons why goodwill is impaired which are not disclosed as part of the disclosure notes. As with Hypothesis 1, the present study uses South African data, which is assumed to be more reliable than data from other

developing countries that are not known for their strong corporate governance mechanisms.

Hypothesis 3 (H₃):

Certain determinants affect the quality of goodwill impairment disclosure more than others.

Even though *IAS 36* requires a significant amount of disclosure, not all firms adhere to these requirements. Some firms merely use the *IAS 36* requirements as a box-ticking exercise, while other firms provide more in-depth information. Prior empirical studies have focused mainly on whether firms adhere to the *IAS 36* disclosure requirements, whereas the present study aims to determine whether there are certain determinants which will result in higher quality of disclosure.

Hypothesis 4 (H₄):

Goodwill impairment and its disclosure are value relevant.

The effect of goodwill impairment disclosure on firm value has yet to be explored in more detail. The purpose of financial reporting under the IASB's requirements is to provide information about the reporting entity that is useful to existing and potential investors, as well as to other stakeholders. Prior empirical studies have focused mainly on whether firms adhered to the *IAS 36* disclosure requirements. The impairment of goodwill consists of the value of the impairment, as well as the accompanying test-related disclosure.

Hypothesis 5 (H₅):

The quality of goodwill impairment disclosure differs, based on the various ways in which reasons are provided by management for impairing goodwill, and the quality of goodwill impairment disclosure differs amongst industries.

According to the requirements of *IAS 36*, firms are required to give details surrounding the impairment of goodwill. The reasons provided by management can be classified in different categories, and these reasons (and the way management explains these reasons) may predict the quality of disclosure. Goodwill intensity is also dependent on the industry in which a firm operates. Firms with higher levels of goodwill are likely to be more compliant with *IAS 36*, because they are more accustomed to the

requirements than firms with lower levels of goodwill. Hence, the level of compliance differs amongst industries.

These hypotheses are tested to address the research objectives of the present study. In the next chapter, the research design and methods used are discussed in detail.

CHAPTER 4: RESEARCH METHOD

4.1 INTRODUCTION

In this chapter, the research design and methods used in the study are discussed and their choice is justified. The chapter also explains how the design and methods relate to the research objectives.

As has been explained in Chapter 3, value relevance research is aimed at determining whether the disclosure of an accounting number can explain the valuation of an entity's equity. According to Barth, Beaver, and Landsman (2001), an accounting number can only be value relevant if it represents and reflects information that is relevant for users when evaluating equity, and is therefore reflected in the share price. These facts informed the hypotheses formulated in Section 3.3.

The first aim of the present study is to determine whether goodwill, as accounted for under *IFRS 3*, is value relevant (this aim is reflected in Hypothesis 1). The second aim is to establish what the underlying reasons for goodwill impairment are (this led to Hypothesis 2). The third aim is to investigate determinants of quality disclosure (see Hypothesis 3) and the fourth is to determine whether goodwill impairment and its disclosure are value relevant (see Hypothesis 4). The fifth and last aim is to investigate the ways in which reasons are provided for goodwill impairment and the disclosure quality in the various industries by means of a cluster analysis (see Hypothesis 5).

The literature review has revealed that prior studies have reported contradictory evidence on whether goodwill and goodwill impairments are value relevant. These contradictions may possibly be ascribed to the fact that different researchers focused on different periods in determining the impact of changes proposed by *IFRS 3*, which was adopted in 2001. During the first few years, the preparers of financial statements were still adapting to the changes proposed by these updated reporting standards. The present study therefore focused on a post-implementation period to ensure that the results are a true reflection of the goodwill impairment regime. To this end, this study used linear regression, content analysis and cluster analysis, for the reasons

discussed in this chapter, to gain insight into the value relevance of goodwill and the disclosure of goodwill impairment.

The chapter is structured as follows: Section 4.2 indicates the research paradigm of the study and Section 4.3 sets out the research objectives clearly. Sections 4.4 and 4.5 provide details on the research design and the instruments that were used. Section 4.6 clarifies the research sample and data used, while Section 4.7 discusses the panel data set. Section 4.8 explains how the data analysis was performed and the model specification, and Section 4.9 discusses model validity. This is followed by Sections 4.10 and 4.11, which acknowledge the limitations of the methods applied and discuss the applicable ethical considerations before the chapter then concludes with Section 4.12.

4.2 RESEARCH PARADIGM

The present study adopted a positivist paradigm. A positivist paradigm, also known as logical positivism, maintains that the only way to establish a truthful and objective reality is through a logical, systematic and scientific approach (Wagner, Kawulich, & Garner, 2012). The positivist paradigm was deemed appropriate for the present study because the study aims to yield objective and unbiased results regarding goodwill, goodwill impairment and its disclosure and related value relevance issues. This is achieved by means of an analysis of annual reports based on secondary data. Therefore, a positivist paradigm was suitable for the study, since the study uses deductive reasoning and quantitative techniques.

4.3 RESEARCH OBJECTIVES

The aim of the study is to provide evidence on the value relevance of goodwill and goodwill impairments by JSE-listed firms. Another research area is the quality of goodwill impairment disclosure and compliance with accounting standards as prescribed by the IASB.

As Ramanna and Watts (2012) explain, agency theory predicts that firms will often use the managerial discretion required in accounting, for example, in using and reporting on impairment tests, such as those that have to be reported under *IAS 36*, to manage financial results opportunistically. In the calculation of goodwill impairment, there is

thus room for manipulation by management, which can in turn result in agency costs. Therefore, the theoretical foundation of the proposed study is the agency theory. The study aims, through statistical analysis, to determine the influence of managements' actions on goodwill, and the subsequent effect on firm value.

To address the research problem, the research objectives of the study are the following:

- Research Objective 1 is to determine the impact of goodwill on firm value and whether it is relevant for the decision-making of South African equity investors.
- Research Objective 2 is to identify the determinants of goodwill impairment decisions.
- Research Objective 3 is to identify the determinants of quality disclosure of goodwill impairment.
- Research Objective 4 is to ascertain whether goodwill impairment and its disclosure are value relevant.
- Research Objective 5 is to determine whether the quality of disclosure can be predicted based on the ways in which reasons are provided for goodwill impairment by management and whether the quality of goodwill impairment disclosure differs between industries.

The research objectives are reflected in the hypotheses which were tested using the research models described in Section 4.8. The hypotheses of the present study (repeated here for the reader's convenience) are the following:

- H₁: *Goodwill, as accounted for in accordance with IFRS 3, is value relevant.*
- H₂: *There are statistically significant determinants of goodwill impairment decisions.*
- H₃: *Certain determinants affect the quality of goodwill impairment disclosure more than others.*
- H₄: *Goodwill impairment and its disclosure are value relevant.*
- H₅: *The quality of goodwill impairment disclosure differs, based on the various ways in which reasons are provided by management for impairing goodwill, and the quality of goodwill impairment disclosure differs amongst industries.*

4.4 RESEARCH DESIGN

The research design is a variation on the analysis of secondary research data available from a commercial database, as well as a content analysis performed on the annual financial statements of the sampled JSE-listed firms.

4.4.1 Secondary research data analysis

To assess whether secondary data are appropriate to address a study's research questions and objectives, consideration should be given to reliability, validity and measurement bias. Reliability and validity attributed to secondary data are functions of the method by which the data were collected and the source of the data (Saunders, Lewis, & Thornhill, 2019). The quantitative and qualitative data used in this study were taken from the annual reports of JSE-listed entities to form the basis of the research. Various variables used in the study were obtained from the IRESS database, a reliable supplier of South African financial data. The annual reports used in this study were sourced from IRESS in the form of complete PDF copies of the sample firms' annual reports. It is assumed that the financial statements are a true reflection of a firm's financial position on the reporting date. Qualitative information was sourced from firms' annual integrated reports to determine the quality of goodwill impairment disclosure.

4.4.2 Content analysis

With specific reference to the quality of disclosure of goodwill impairments, a content analysis of the firm's integrated reports was performed. The quality of disclosure was measured by applying a disclosure index based on the requirements set out in *IAS 36*.

For each of the sample years with reported goodwill impairment, the annual financial statements were obtained from IRESS. From *IAS 36*, a list of disclosure requirements was formulated (see Appendix A). For each sample year, the reasons for goodwill impairment, as provided by management in the financial statements, were documented.

The content analysis was extended by obtaining the corporate governance control variables required for the study.

4.5 RESEARCH INSTRUMENTS

The population from which the data were sampled was all firms listed on the JSE on 31 December 2017, but some firms were excluded, based on the inclusion criteria set out in Section 4.6.

The financial statement data were collected from IRESS (see Section 4.4.1). One of the JSE requirements is that firms must be compliant with IFRS. Furthermore, listed firms must be audited each year, which reinforces the assumption (see Section 4.4.1) that the financial statements are a true reflection of a firm's current state of affairs.

The disclosure index (see Section 4.4.2 and Appendix A) used to assess the quality of disclosure of each firm was based on the requirements set out in paragraphs 134 and 135 of *IAS 36*. Goodwill impairment test-related disclosure data were manually collected from the annual reports accessed from the IRESS database.

4.6 DATA AND SAMPLE

The data sample was the financial statements of JSE-listed companies for a 12-year period (2006 to 2017) in which there were acquisitions that led to the existence of goodwill. This information was obtained from IRESS and the various firms' annual financial reports.

Firms from the financial sector were excluded from the sample, because of the unique characteristics of this industry. Financial firms are known to have a minimal level of operational assets and are subject to strict regulatory requirements that could potentially affect the relation between their accounting numbers and market values (Dahmash *et al.*, 2009). It is common to exclude these firms from studies that investigate mandatory disclosures (André *et al.*, 2018; Mazzi *et al.*, 2017).

For inclusion in the final sample, firms had to meet the following criteria:

- At least 12 annual financial reports from 2006 to 2017 had to be available on the IRESS database.
- There had to be a goodwill balance in the Statement of Financial Position for one or more of the 12 years.

- The firm's corresponding market and accounting information also had to be available on the IRESS database.
- Firms from the financial industry were excluded because they form part of a regulated industry with financial reporting that differs from that in other industries.

Firms with the JSE as a secondary listing were also included in the sample. As already discussed in the literature review in Sections 2.2.7 and 2.2.8, the differences between the accounting policies under US GAAP and IFRS with regard to goodwill and its subsequent impairments are immaterial to this study. Therefore, the country of primary listing does not have an impact on the outcomes of this study and such firms could therefore be included. Table 4.1 contains information on the sample of South African listed companies between the period from 2006 and 2017.

Table 4.1: Summary of the full data sample per industry

Sectors and companies listed on the JSE and available to be sampled on 31/12/2017	Number in each industry	Percentage of sample
Basic materials	52	23%
Consumer goods	30	14%
Consumer services	54	24%
Health care	10	4%
Industrials	51	23%
Oil & Gas	1	1%
Technology	20	9%
Telecommunications	4	2%
Total companies available to be sampled	222	100%
Companies not listed for the entire sample period	93	
Companies with no goodwill balances for the period	22	
Companies with published financial statements under investigation*	1	
Total companies excluded	115	
Total selected sample	106	
Basic materials	21	20%
Consumer goods	9	8.5%
Consumer services	27	25%
Health care	3	3%

Sectors and companies listed on the JSE and available to be sampled on 31/12/2017	Number in each industry	Percentage of sample
Industrials	34	32%
Oil & Gas	1	1%
Technology	9	8.5%
Telecommunications	2	2%
Final selected sample	106	100%
*Given that investigations into the financial practices and reporting of Steinhoff holdings are ongoing, prior financial statements should not be relied upon (Styan, 2018).		

Source: IRESS database (IRESS Expert, 2017)

As indicated in Table 4.1, a total of 106 firms were included in the data sample. This resulted in 1 272 firm-year observations (106 firms x 12 years) for H₁.

In order to test H₂, H₃, H₄ and H₅, data were collected from the integrated reports by means of a content analysis of each firm-year with reported goodwill impairment. Among the 1 272 firm-year observations in the final sample, there were 300 firm-year goodwill impairments (in other words, throughout the sample period of 12 years, goodwill impairment occurred 300 times). Information on the firm-year observations of goodwill impairment is set out in Table 4.2. The number listed per industry indicates the total firm-year observations.

Table 4.2: Summary of data sample with goodwill impairments per industry

Sector and companies of firm-year observations from final sample (shown in Table 4.1)	Number in each industry	Percentage of sample
Basic materials	48	16%
Consumer goods	13	4%
Consumer services	67	22%
Health care	8	3%
Industrials	122	41%
Oil & Gas	3	1%
Technology	30	10%
Telecommunications	9	3%
Total	300	100%

Source: Author's analysis adapted from IRESS database (IRESS Expert, 2017)

Therefore, 300 firm-year observations were used to test H₂ to H₅. By comparison, the study by Avallone and Quagli (2015) of European listed companies over the period

2007 to 2011 identified 656 firm-year observations with goodwill impairment. However, they excluded 328 of these because of a lack of information on the variables used in the goodwill impairment test. In the present study, all the firms that impaired goodwill in the sample period were included, even if such variables were unknown. However, the inclusion or omission of this information was used to allocate a disclosure index score – firms that omitted variables were given a lower disclosure index score, which enabled the researcher to distinguish between the different levels of quality of disclosure.

4.7 PANEL DATA

The study used a panel data framework. With a panel data design, observations are pooled on a cross-section of units over several periods. This design provides results that are not simple to measure by means of pure cross-sections or pure time-series techniques. The four main advantages of using a panel design are that the sample size can be increased, individual heterogeneity (differences among individual objects) can be controlled for, multicollinearity (correlation among the explanatory variables) can be reduced, and statistical problems such as endogeneity can be minimised (Gujarati & Porter, 2009). Possible unobserved individual effects arising from individual heterogeneity are controlled for by using repeated observations on the same companies over time.

Panel least squares is identical to ordinary least squares (OLS) where no effect (fixed or random) specification, weights or coefficient covariance method are selected. The method is also referred to as pooled OLS. It affords the specification of fixed or random effects, weights and coefficient covariance methods, so it extends the original method to allow for more accurate inferences of model parameters. Because of the nature of the data, panel least square regression was performed.

For each of the hypotheses, tests were performed to determine whether the fixed effects model or the random effects model needed to be employed. The difference between the two models relates to the error term. The fixed effects model assumes that an individual effect is constant, whereas the random effects model assumes that an individual effect is random. Incorporating fixed effects can account for firm-specific effects that are not captured by the explanatory variables. In line with a study by Bepari

and Mollik (2015), the Hausman test was used to determine whether a fixed effect panel regression or a random effect panel regression should be performed. The Hausman test was performed for each regression model, and produced different results. The effects (fixed versus random) are discussed in the data analysis chapters, Chapters 5 to 7.

4.8 ANALYSIS AND MODEL SPECIFICATION

In this section, the model specification for each of the research objectives is discussed.

4.8.1 Research Objective 1

To address the first research objective, restated in H₁, to ascertain whether goodwill is value relevant, the Ohlson (1995) model was employed.

4.8.1.1 *The Ohlson (1995) model to determine value relevance*

The Ohlson (1995) model is a well-known accounting-based valuation model that is often used in value relevance research. It includes an information link between accounting information and the future stream of earnings from an equity investment, as well as a valuation link between future earnings and share prices (Ben Naceur & Goaid, 2004). This accounting-based valuation model was developed by Ohlson (1995) and has subsequently been refined, amongst others, by Barth, Beaver, and Landsman (2001). In terms of this model, firm value can be determined by a function of the book values of equity, together with earnings. Barth, Beaver, and Landsman (2001) explain that accounting earnings are used in this model to include information relating to the asset and liability values currently not represented in the Statement of Financial Position. According to the findings of Lee, Chen, and Tsa (2014), this model is better able to predict future stock prices than the dividend discount model.

The dependent variable in the Ohlson (1995) model is the market value of the firm. The firm's book value of equity and the earnings for the year are the independent variables in this model. The original Ohlson (1995) model is the following:

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVE_{i,t} + \alpha_2 NI_{i,t} + \varepsilon_{i,t} \quad (4.1)$$

where

- *MVE* is the share price of a firm *i* three months after the year-end reporting date *t* (the reason for the time lag is to ensure that the information transferred in the annual reports has been incorporated in the share price);
- *BVE* is the book value of the firm's net assets at the year-end reporting date; and
- *NI* is the net income of the firm for the reporting year.

According to Barth *et al.* (1998), there is also 'other information' that comes into play when one uses the Ohlson (1995) valuation model. For example, one can interpret goodwill as one of the 'other information' variables embedded in the Ohlson model, and this means that goodwill can be included in the model as an independent variable, as was done in the study by Bugeja and Gallery (2006). If one then observes that goodwill is a significant predictor of market value, it provides evidence that goodwill captures valuation-relevant information that is not reflected in the book value of equity or in the annual earnings.

Net income (*NI*) for the year represents the net income before extraordinary items. This definition was used to focus on the Statement of Comprehensive Income's primary summary measure. Net income before extraordinary items was used because the constraints on such items result in their being likely to have valuation effects quite different from those of other components of net income (Barth, Beaver, & Landsman, 2001).

The variables were scaled by the number of shares issued. According to Barth and Clinch (2009), this is the most reliable method because it compensates for incorrect inferences as a result of scale effects. This approach was also followed by Chalmers *et al.* (2008) and Zining *et al.* (2011).

4.8.1.2 Testing Hypothesis 1 (H_1): Adjusted Ohlson (1995) model to determine the value relevance of goodwill

$$MVEPS_{i,t} = \alpha_0 + \alpha_1 BVEPS_{i,t} + \alpha_2 NIPPS_{i,t} + \alpha_3 GWPS_{i,t} + \ln SIZE_{t-1} + \varepsilon_{i,t} \quad (4.2)$$

where

- $MVEPS$ is the share price of firm i , three months after the year-end reporting date, t ;
- $BVEPS$ is the book value of net assets per share of a firm at the year-end reporting date;
- $BVEPS_{exGW}$ is the book value of net assets of a firm at the year-end reporting date excluding goodwill;
- $NIPS$ is the net income per share of the firm for the reporting year;
- $GWPS$ is the reported goodwill per share of a firm at the year-end reporting date; and
- $\ln SIZE_{t-1}$ is the natural log of total assets at the end of the previous year.

4.8.2 Research Objective 2

The second objective of the study is to identify the determinants of goodwill impairment decisions. Furthermore, the determinants of quality goodwill impairment disclosure are investigated. Achieving this objective involved two steps. Firstly, stated as H_2 the underlying reasons were determined by means of a regression analysis. Secondly, stated as H_3 , the disclosure score was calculated for each firm by means of the disclosure index. This disclosure score was then used in a multivariate regression analysis to investigate the determinants of quality goodwill impairment disclosure.

4.8.2.1 Testing Hypothesis 2 (H_2): Regression analysis to identify the determinants of goodwill impairment decisions

In their study, AbuGhazaleh *et al.* (2011) could not perform a regression analysis, because the dependent variable (goodwill) was censored: if firms experience an increase in the economic value of goodwill, they are not allowed to record this increase, and therefore the distribution of the dependent variable is censored to zero. If the dependent variable in the OLS regression is censored, then bias and inconsistent estimates are produced (AbuGhazaleh *et al.*, 2011). However, if the value of the dependent variable is known, such as the value of goodwill impairment, a linear regression can be performed, as was done in the studies by Bens *et al.* (2011) and Masters-Stout *et al.* (2008). For the purposes of the present study, the dependent

variable was known (goodwill impairment), and therefore a panel least squares regression analysis was performed.

The second objective of the present study is to determine the reasons that goodwill impairment occurs. Hence, goodwill impairment is the dependent variable in the second regression. This is consistent with the studies performed by AbuGhazaleh *et al.* (2011) and Masters-Stout *et al.* (2008).

Various underlying reasons for goodwill impairment were identified from the literature, as indicated below. These reasons were taken as the independent variables in this study, as explained below.

- *CEO tenure:*

Masters-Stout *et al.* (2008) identified two types of CEOs. The first was appointed recently (in the last two years), and the rest are CEOs who have been appointed for longer and are not considered new. Data on this variable were collected by means of a content analysis from the annual reports. The variable was also used by AbuGhazaleh *et al.* (2011). In the present study, it is assumed that a change in CEO will result in goodwill impairments; therefore a positive sign is hypothesized.

- *Earnings management:*

Masters-Stout *et al.* (2008) used net income as a proxy to determine whether goodwill impairments are used for earnings management. If a 'big bath' strategy is followed, lower net income indicates higher impairment. On the other hand, with higher net income, the goodwill impairment can be higher because it can be more easily absorbed. In order to investigate both scenarios, no sign was hypothesized.

- *Prior profitability:*

AbuGhazaleh *et al.* (2011) hypothesized that the poorer a firm's past profitability, the greater the magnitude of goodwill impairments. In the present study, ROA was used as proxy to measure prior profitability, and a negative correlation was predicted between past profitability and goodwill impairment magnitude.

- *Corporate governance:*

To test whether firms with stronger corporate governance mechanisms are more likely to report non-opportunistic goodwill impairments, a number of variables were used by AbuGhazaleh *et al.* (2011). Director's independence was expressed as the percentage of non-executive directors out of the total number of board

members. More proxies for determining corporate governance included the frequency of board meetings and the percentage shareholding of board members. One would expect that if there are more frequent board meetings and if board members have a shareholding interest in the firm, that should improve corporate governance, therefore a positive sign is hypothesized.

- *Merger and acquisition activity:*

Firms that are active in merger and acquisition activities are more likely to impair goodwill relating to unprofitable acquisitions (AbuGhazaleh *et al.*, 2011), a positive sign was hypothesized.

- *Size of a firm:*

As in Beatty and Weber's (2006) and AbuGhazaleh *et al.*'s (2011) studies, total assets was used to control for size, a positive sign was hypothesized.

To determine which of the underlying reasons listed above resulted in the goodwill impairment of the sampled firms in the present study, the following model was developed, based on the literature cited above:

$$GIL = \alpha_0 + \beta_1 \Delta CEO + \beta_2 NI + \beta_3 ROA + \beta_4 BINDEP + \beta_5 BACTIVITY + \beta_6 ADD + \beta_7 \ln SIZE_{t-1} + \varepsilon \quad (4.3)$$

where

- *GIL* is firm *i*'s reported goodwill impairment loss;
- *CEO* is a dummy variable indicating whether there was a change in CEO in the current year;
- *NI* is firm *i*'s reported net income;
- *ROA* is the return on assets for firm *i*;
- *BINDEP* is the number of independent non-executive directors divided by the total number of directors;
- *BACTIVITY* is the number of meetings held by the board of directors during the financial year;
- *ADD* is a dummy variable indicating whether a firm had acquisitions during the financial year; and
- *lnSIZE_{t-1}* is the natural log of total assets at the end of the previous year.

4.8.3 Research Objective 3

The third research objective of the study is twofold. The first aspect is to identify the determinants of quality disclosure of goodwill impairments, stated as H_3 . The second, stated as H_4 , is to ascertain whether goodwill impairment disclosure is value relevant.

4.8.3.1 Testing Hypothesis 3 (H_3): Content analysis to determine the quality of goodwill impairment disclosure

An information content analysis was performed to determine whether firms complied with the mandated disclosure items for goodwill impairments as prescribed by IAS 36. The data were manually collected from the sampled firms' integrated reports, which were obtained from the IRESS database. The quality of disclosure was determined by applying the disclosure checklist compiled from paragraphs 134 and 135 of IAS 36 (see Appendix A). Partial compliance was built into the index to ensure that the quality of disclosure was captured and not just the existence or nonexistence of disclosure. It is important to distinguish between companies that only make standardised disclosures and those that make an effort to provide more detailed explanations that allow users to understand the impairment testing that was performed better (Carvalho *et al.*, 2016). Table 4.3, overleaf, shows the items used for the construction of the compliance (disclosure) score.

Table 4.3: IAS 36 items used to calculate the goodwill impairment disclosure score

Item	Relevant to firms using the value-in-use method?	Relevant to firms using the fair value method?	Reference to IAS 36 sections/ paragraph
Carrying amount of goodwill allocated to the unit (group of units)	Yes	Yes	134 (a)
Basis on which the unit's recoverable amount has been determined	Yes	Yes	134 (b)
Disclosure relating to key assumptions	Yes	Yes	134 (d)(i), (e)(i)
Management approach to determine the value of each key assumption	Yes	Yes	134 (d)(ii), (e)(ii)
Period considered for cash flow modelling, justification if longer than five years	Yes	Yes	134 (d)(iii), (e)(iii)
Growth rate used in cash flow modelling disclosed	Yes	Yes	134 (d)(iv), (e)(iv)
Discount rate used in cash flow modelling disclosed	Yes	Yes	134 (d)(v), (e)(v)
Valuation technique used to measure fair value less cost to sell	No	Yes	134 (e)
Level of the fair value hierarchy	No	Yes	134 (e) (iiA)
Disclosure effect on value if there is a reasonable change in any key assumption	Yes	Yes	134 (f)

Source: Author's compilation based on IAS 36

The disclosure index for each company was computed as follows:

- For each of the disclosure requirements, a score was allocated as follows: 1 if fully compliant, 0.5 if partially compliant, and 0 if not compliant.
- The required disclosure score was calculated by adding the items' score as 1, 0.5 or 0. Using the items in Table 4.3, the maximum number of potential disclosures for a firm using the value-in-use method to determine the recoverable amount was

8. If a firm used the fair value less costs to sell method, the maximum number of potential disclosures was 10. The final score was computed by dividing the total score for a firm by the maximum possible score that the particular company is expected to achieve.

- From these scores, an arithmetic average was calculated to determine the quality of goodwill impairment disclosure.

The compliance index used by Bepari and Mollik (2015) was employed in the present study. A compliance index (*dscore*) is a ratio computed by dividing the total actual score for a company by the maximum possible score that a company is expected to achieve, represented by the following equation:

$$dscore_{j,t} = \frac{\sum_{i=1} d_{i,j,t} r_{i,j,t}}{\sum_{i=1} r_{i,j,t}} \quad (4.4)$$

where

- $dscore_{j,t}$ is the unweighted compliance score for goodwill impairment testing for firm j during year t ;
- $d_{i,j,t}$ indicates the disclosure of item i , by firm j during year t , $i = 1, \dots, 11$. $d_{i,j,t} = 1$ if item i is disclosed by firm j during year t , and $d_{i,j,t} = 0$ if the item is not disclosed; and
- $r_{i,j,t}$ indicates whether disclosure item i is required by firm j during year t .

Thus $r_{i,j,t} = 1$ if disclosure of item i is required by firm j during year t , and $r_{i,j,t} = 0$ if disclosure is not required.

This unweighted compliance score was also used by Hodgdon, Tondkar, Harless, and Adhikari (2008).

4.8.3.2 Hypothesis 3 (H₃): Multivariate regression analysis to identify the determinants of quality of goodwill impairment disclosure

Similar to the studies by Bepari *et al.* (2014) and Kabir *et al.* (2017), the present study empirically examined the role of disclosure in the notes to the financial statements, of estimates and legal judgments in accordance with IAS 36. The models used in these

studies were modified to examine the level of comprehensiveness of disclosure and were applied in the present study. The disclosure index calculated for each firm was used as the dependent variable.

The proxy for understated goodwill impairment loss was a dummy variable, *UGIL*. This dummy variable was assigned a score of 1 if the MTB was less than 1, but the goodwill impairment loss was zero, and a score of 0 otherwise. This is consistent with the finding in the literature that an MTB less than 1 is an indicator of possible goodwill impairment (Beatty & Weber, 2006; Kabir *et al.*, 2017; Ramanna & Watts, 2012). The proxy for understated goodwill impairment loss was based on the argument that goodwill is impaired when the book value of equity exceeds the market value of equity (Beatty & Weber, 2006). If goodwill impairment is understated, it is likely that the test-related disclosure is also reduced, therefore a negative sign is hypothesized.

The control variables used in the present study are the following:

- *Materiality:*
This dummy variable indicates whether goodwill is material in relation to the total assets. Firms with a higher goodwill value are likely to have higher quality of disclosure.
- *Return on assets:*
As in AbuGhazaleh *et al.*'s (2011) study, the present study controlled for firm-specific past performance and firm-specific changes in performance.
- *Size:*
Size was measured as the natural log of total assets at the end of period $t - 1$ in line with AbuGhazaleh *et al.* (2011) and Beatty and Weber (2006).
- *Leverage:*
To control further for firm performance, leverage was included, in line with Verriest and Gaeremynck (2009).
- *Intangible assets:*
This control variable was included, based on the assumption that firms with more intangible assets are likely to comply better with IAS 36.
- *Big 4 auditor:*
If a firm uses a high quality auditor, this should improve goodwill impairment reporting (Binti Omar, Mohd-Saleh, Salleh, & Ahmed, 2015).

- *Board independence:*
The independence of the board was calculated based on the number of independent directors in relation to the total number of directors, in line with Ahmed and Duellman (2007).
- *Audit committee independence and expertise:*
These variables were included to control for effective corporate governance mechanisms, as suggested by AbuGhazaleh *et al.* (2011).
- *Industry:*
Different industries should be controlled for, because the tendency to impair goodwill may differ across industries (Binti Omar *et al.*, 2015).

Based on this analysis of the past literature, the following model was developed to test H_3 for the present study:

$$DISC = \alpha + \beta_1UGIL + \beta_2MAT + \beta_3ROA + \beta_4\ln SIZE_{t-1} + \beta_5LEV + \beta_6INTAN + \beta_7BIG4 + \beta_8BIND + \beta_9AUDIND + \beta_{10}AUDEXP + INDUSTRY + YEAR + \varepsilon \quad (4.5)$$

where

- *DISC* is the goodwill impairment-related disclosure index;
- *UGIL* is a dummy variable indicating whether the goodwill impairment loss is understated;
- *MAT* indicates the materiality of firm *i*'s goodwill;
- *ROA* is the return on assets;
- *lnSIZE_{t-1}* is the natural log of total assets at the end of the prior year;
- *LEV* measures total liabilities divided by total assets;
- *INTAN* measures the total intangible assets excluding goodwill;
- *BIG4* is a dummy variable indicating whether a firm was audited by a Big4 auditing firm;
- *BIND* indicates the number of independent directors, scaled by board size;
- *AUIND* is the number of independent audit committee members, scaled by audit committee size;
- *AUDEXP* is a dummy variable indicating whether at least one audit committee member has a professional accounting degree;

- *INDUSTRY* is an indicator variable of industry; and
- *YEAR* is an indicator variable of the year.

4.8.3.3 Testing Hypothesis 4 (H_4): Adjusted Ohlson (1995) model to determine the value relevance of goodwill impairments and its disclosure

The research design to determine the effect of goodwill impairments on firm value largely follows the method employed by Kabir *et al.* (2017), who modified the Ohlson (1995) model to test the associations between market prices and goodwill impairment losses and impairment test-related disclosures.

The dependent variable used in the Ohlson (1995) model is the market value of firm i . The independent variables are the book value of equity, the net income per share (excluding the goodwill impairment loss per share), the goodwill impairment loss per share, the goodwill impairment test-related score and the interaction between the goodwill impairment loss per share and the disclosure score.

$$MVEPS_i = \alpha + \beta_1 BVEPS + \beta_2 NIPSexGILPS + \beta_3 GILPS + \beta_4 DISC + \beta_5 INT_DISC * GILPS + \varepsilon_i \quad (4.6)$$

where

- *MVEPS* is the price per share, three months after the year-end;
- *BVEPS* is the book value per share of firm i at the end of year t ;
- *NIPSexGILPS* is the net income per share, excluding the goodwill impairment loss per share;
- *GILPS* is the goodwill impairment loss per share;
- *DISC* is the goodwill impairment-related disclosure score; and
- *INT_DISC * GILPS* is the interaction between goodwill impairment loss per share and the disclosure score.

4.8.4 Research Objective 4

The fourth research objective is to analyse the different industries regarding reported reasons for goodwill impairment and their disclosure quality. Under this research objective, H_5 was formulated to investigate the difference in the quality of goodwill impairment disclosure between industries, and how the different reasons were

provided by management for why firms impaired goodwill. To test H_5 , a cluster analysis was performed.

4.8.4.1 Cluster analysis of quality of disclosure of goodwill impairments

A cluster analysis is a multivariate method which aims to classify a sample of objects on the basis of a set of measured variables into a number of different groups in such a way that similar subjects are categorised as belonging to the same group. Cluster analysis is an explorative analysis technique to identify structures within the data. It performs the task of grouping a set of objects in such a way that clusters can be readily identified that show similar characteristics in the same cluster.

In the present study, a two-step cluster was performed to allow the simultaneous analysis of both categorical and continuous data (Rundle-Thiele, Kubacki, Tkaczynski, & Parkinson, 2015). Cluster analysis was conducted in two steps in order to optimize the benefits of each algorithm.

The first step was to perform a hierarchical cluster analysis by using Ward's method to select the appropriate number of clusters (Carvalho *et al.*, 2016). The second step involved using these results to set a non-hierarchical k -means clustering (k is the number of clusters chosen). This two-stage procedure is known to increase the validity of solutions (Ketchen & Shook, 1996). Forming clusters hierarchically enables a researcher to explore a variety of solutions with the different numbers of clusters. A series of solutions are formed, which are then reduced to the best number of clusters on the basis of Schwarz's Bayesian information criterion (BIC). The BIC is a valuable and unbiased selection criterion, because it avoids the uncertainty of traditional clustering techniques. When considering which variables to eliminate from the analysis, the one(s) with the lowest BIC should be selected. Once the cluster solution is formed, the silhouette measure of cohesion and separation must be higher than 0.0. This value suggests that the within-cluster distance and the between-cluster distance is valid (Norusis, 2012).

Cluster analysis makes no prior assumptions about differences in the sample and does not predict outcomes in advance. According to Ketchen and Shook (1996), the quality of a cluster solution depends on the following four elements:

- the choice of attributes (which categories will be identified through the content analysis) to be included in the analysis;
- the selection of the correct clustering method;
- the optimal number of clusters; and
- validation of the cluster results.

For the 300 goodwill impairment sample years of the present study, a cluster analysis was performed by incorporating industry, account type of goodwill impairment, as well as the disclosure index score. This was done to determine which account type was predominant for which industry. For each cluster type, the disclosure score index was also analysed.

4.8.4.2 Reported reasons for goodwill impairment

Based on studies by Scott and Lyman (1968) and Sandell and Svensson (2017), the ways in which management reports reasons for goodwill impairment can be classified as excuses, justification, refocusing, concession, mystification, wordification or silence. Table 4.4 presents a schematic taxonomy of these account types.

Table 4.4: Taxonomy of ways in which reasons are provided for goodwill impairments

Reason	Definition	Characteristics
Excuse	An admission that the event or act is 'bad, wrong or inappropriate', but there is denial of responsibility (Scott & Lyman, 1968). Examples may be appeals to external circumstances, accidents or shortcomings of others (Sandell & Svensson, 2017).	Externalization of the cause. Justification of the failure, e.g. by referring to the 'market'.
Justification	Acceptance of responsibility for an event or act, but denial of the negative qualities associated with it (Scott & Lyman, 1968). Examples are denial or minimizing the damage, appealing to positive intentions (Sandell & Svensson, 2017).	Negative consequences, but they have been reported previously (no new damage has occurred). Predictability, awareness and control are emphasised.
Refocusing	An account that either redirects the reader's attention away from the event to a different issue or shifts the focus (Sandell & Svensson, 2017).	Focus on other aspects of the business than the failure event. Adjustment of orientation to the past or the future.
Concession	An acknowledgement of guilt and where the account giver takes responsibility for the event.	
Mystification	An admission that expectations have not been met but without offering any reasons offered (Sandell & Svensson, 2017). The language used makes it difficult for the reader to interpret.	Imprecise or vague language. Excessive use of technical terms.
Wordification	A response that is merely a translation of numbers into words, a repetition of the accounting language (numbers) in natural language (words) (Sandell & Svensson, 2017).	Text adds no new information content to the numbers used.
Silence	An account when there is nothing to be gained by giving an explicit account or comments are deemed unnecessary (Sandell & Svensson, 2017).	No comments in terms of natural language.

Source: Author's compilation from Scott and Lyman (1968) and Sandell and Svensson (2017)

As part of the content analysis, the reported reasons for goodwill impairment were identified for each sample year. The reasons were classified in terms of the above taxonomy of ways to account for goodwill impairment.

4.8.5 Summary of models used and variable construction

In summary, the following models were used to address the hypotheses developed in the present study:

Hypothesis 1 (H₁):

$$MVEPS_{i,t} = \alpha_0 + \alpha_1 BVEPS_{i,t} + \alpha_2 NIPSexGW_{i,t} + \alpha_3 GWPS_{i,t} + \ln SIZE_{t-1} + \varepsilon_{i,t} \quad (4.2)$$

Hypothesis 2 (H₂):

$$GIL = \alpha_0 + \beta_1 \Delta CEO + \beta_2 NI + \beta_3 ROA + \beta_4 BINDEP + \beta_5 BACTIVITY + \beta_6 ADD + \beta_7 \ln SIZE_{t-1} + \varepsilon \quad (4.3)$$

Hypothesis 3 (H₃):

$$DISC = \alpha + \beta_1 UGIMP + \beta_2 MAT + \beta_3 ROA + \beta_4 \ln SIZE_{t-1} + \beta_5 LEV + \beta_6 INTAN + \beta_7 BIG4 + \beta_8 BIND + \beta_9 AUDIND + \beta_{10} AUDEXP + INDUSTRY + YEAR + \varepsilon \quad (4.5)$$

Hypothesis 4 (H₄):

$$MVEPS_i = \alpha + \beta_1 BVEPS + \beta_2 NIPSexGIMPS + \beta_3 GILPS + \beta_4 DISC + \beta_5 INT_DISC * GILPS + \varepsilon_i \quad (4.6)$$

Hypothesis 5 (H₅):

The quality of goodwill impairment disclosure differs, based on the way in which the various reasons are provided by management for impairing goodwill, and the quality of goodwill impairment disclosure differs amongst industries.

The quality of disclosure (as measured by the disclosure index) for each firm-year observation was compared within each industry and between industries and in terms the ways in which management provided reasons for the particular goodwill impairment.

The definitions of variables were largely adopted from IRESS and the existing literature with the aim of allowing a meaningful comparison with earlier empirical studies. The construction of the variables for the empirical analyses is presented in Table 4.5 (overleaf). Column 1 presents the abbreviation used in Equation 5.1. Column 2 reports the variables in full and Column 3 defines the variables. Column 4 provides the data source.

Table 4.5: Description of variables used in the study

Abbreviation	Variables	Definition of variables	Source
<i>MVE</i>	Share price	Share price three months after year-end date	IRESS database
<i>BVE</i>	Book value of net assets	Book value of net assets	IRESS database
<i>NI</i>	Net income for continuing operations	Accounting-based measure	IRESS database
<i>GW</i>	Goodwill	Goodwill at year-end	IRESS database
<i>GIL</i>	Goodwill impairment	Goodwill impairment for the year	IRESS database
<i>DISC</i>	Disclosure index	Goodwill impairment-related disclosure index (higher value indicates greater disclosure)	Integrated report
<i>UGIL</i>	Understated goodwill impairment	Dummy variable equal to 1 if goodwill impairment loss is understated and 0 otherwise	IRESS database
<i>Underlying reasons for impairment</i>			
<i>CEO</i>	Chief Executive Officer	Dummy variable equal to 1 if firm <i>i</i> experienced a change in CEO in $t - 1$, and 0 if not.	Integrated report
<i>ROA</i>	Return on assets	Accounting-based measure	IRESS database
<i>ADD</i>	Goodwill additions	Dummy variable equal to 1 if firm <i>i</i> has additions to its goodwill because of acquisitions during the financial year	IRESS database
<i>Corporate governance</i>			
<i>BINDEP</i>	Board independence	Number of independent non-executive directors divided by the total number of directors	Integrated report
<i>BACTIVITY</i>	Board activities	Number of meetings held by the board of directors during the financial year	Integrated report
<i>BIG4</i>	External auditors	Dummy variable equal to 1 for Big4 auditors and 0 for others	Integrated report

Abbreviation	Variables	Definition of variables	Source
<i>AUDIND</i>	Auditor independence	Number of independent audit committee members, scaled by audit committee size	Integrated report
<i>AUDEXP</i>	Auditor expertise	Dummy variable equal to 1 if at least one audit committee member has a professional accounting degree and 0 otherwise	Integrated report
Control variables			
<i>lnSIZE_{t-1}</i>	Company size	Natural logarithm of total assets at the end of $t - 1$	IRESS database
<i>MAT</i>	Materiality	Dummy variable equal to 1 if goodwill is at least 0.5% of total assets and 0 otherwise	IRESS database
<i>LEV</i>	Leverage	Total assets divided by total liabilities	IRESS database
<i>INTAN</i>	Intangible assets	Intangible assets excluding goodwill	IRESS database
<i>INDUSTRY</i>	Industry of operation	Indicator variable for industry	IRESS database
<i>NIPS_GILPS</i>	Net income per share, excluding goodwill impairment per share	Net income per share, excluding goodwill impairment loss per share	IRESS database
<i>GILPS</i>	Goodwill impairment loss per share	Goodwill impairment loss per share	IRESS database
<i>INT_DISC*GILPS</i>	Interaction between goodwill impairment loss per share and disclosure score	Interaction between goodwill impairment loss per share and disclosure score	

Source: Author's analysis

4.9 MODEL VALIDITY

Various tests were conducted to build a model that can provide reliable and non-spurious results.

4.9.1 Missing data

It is not uncommon for some observations to be missing from sample data – due to special circumstances, gaps may occur in time series data (Gujarati & Porter, 2009).

In the present study, the sample period covered 12 years (2006 to 2017). Descriptive statistics were compiled to detect whether there were any missing data. With financial data, missing values may be the result of firms' delisting during the sample period, or the possibility of year-end changes. For year-end changes occurring somewhere within the sample period, the values could be replaced. The missing values were investigated on a case-by-case basis to determine the best replacement method. Missing values were only relevant for H_1 , where the entire data sample was used. For H_2 to H_5 , the sample was reduced to include only firms with goodwill impairments.

4.9.2 Presence of outliers

In accounting studies, there are often observations with extreme values that can influence coefficient estimates and inferences (Leone, Minutti-Meza, & Wasley, 2019). Because outliers are different from other cases, they usually exert a disproportionate influence on substantive conclusions regarding relationships among variables (Aguinis, Gottfredson, & Joo, 2013). Moreover, heteroscedasticity can arise as a result of the presence of outliers (Gujarati & Porter, 2009). According to Draper and Smith (2014), outliers should be rejected if they can be traced as errors in recording the observations. To examine the presence of extreme outliers, outlier detection can be performed by means of the boxplot method.

For each model employed in the present study, the outliers were investigated. Based on the circumstances that applied in each case, the outlier was either omitted or kept in the dataset. Winsorization was also considered and used – this refers to transforming extreme values to a specified percentile of the data (Aguinis *et al.*, 2013). The winsorizing procedure is named after the biostatistician Charles P. Winsor. This

method moderates influences of outliers on the mean and variance which in turn results in more robust estimators of location and variability (Frey, 2018). Standard winsorization is used to determine a constant that corresponds with the threshold above which large values were reduced, therefore the value of units are decreased above a particular threshold (Favre-Martinoz, Haziza, & Beaumont, 2015).

4.9.3 Panel data unit root test

Panel unit root tests were performed to determine whether the data were stationary. The term 'stationary data' refers to whether statistical properties of data such as the mean, variance, and autocorrelation structure are constant over time. There are a number of different unit root tests (Gujarati & Porter, 2009) that can be used, and it is important to use the most appropriate one. Individual unit root tests are the Im, Pesaran and Shin W-stat, Augmented Dickey-Fuller test and Phillips-Perron tests, and a common unit root test is the Levin, Lin & Chu test.

It is typical for the results from the various unit root tests to be contradictory in the event of a short time-span (12 years or less) (Kao, 1999). In principle, regression based on non-stationary panel variables may prove spurious, as in the case of time-series. However, Kao (1999) has demonstrated that estimates of the structural parameter binding two independent non-stationary variables converge to zero in the case of panel data, whereas in the case of time series, the random variable is the estimates of the structural parameter binding two independent non-stationary variables. This means that, although non-stationary panel data may lead to biased standard errors, the point estimations of the value of parameters are consistent. It is therefore important to determine the stationarity of data, because it may have an effect on the t-test results of the coefficients. For the present study, unit root tests were performed in the statistical program Eviews, which uses panel unit root testing.

4.9.4 Heteroscedasticity

Heteroscedasticity (the violation of homoscedasticity) is present when the size of the error term differs across the values of an independent variable. The standardised residuals were therefore investigated in the present study to detect the presence of heteroscedasticity, which could indicate that there was significant variability in the

model. However, the estimator used in the present study – estimated generalized least squares (EGLS) – is robust against heteroscedasticity (Gujarati & Porter, 2009).

4.9.5 Serial correlation

Serial correlation is defined as the lag correlation of a given variable with itself over various time intervals. This implies that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation (Gujarati and Porter, 2009). According to Gujarati and Porter (2009), the best test for detecting serial correlation is the Durbin-Watson statistic, which was also used in the present study. As a rule of thumb, Durbin-Watson test statistic values in the range of 1.5 to 2.5 are relatively normal. According to Field (2013), a Durbin-Watson statistic value below 1 or more than 3 is a definite cause for concern. Serial correlation was not of a concern in the present study.

4.9.6 Endogeneity

Endogeneity occurs when an explanatory variable is correlated with the error term. The Hausman (1978) test was used in the present study to test for endogeneity problems, and to determine whether the random or fixed effects model needed to be applied. The null hypothesis underlying the Hausman test is that the random and fixed model estimators do not differ substantially. If the null hypothesis is rejected, it can be concluded that the random effects model is not appropriate because of the random effects' probably being correlated with one or more of the regressors (Gujarati & Porter, 2009). Potential endogeneity problems in the various regressions were addressed in Chapters 5 to 7.

4.9.7 Multicollinearity

Multicollinearity is a phenomenon in which two or more predictor variables in a multiple regression model are highly linearly related. If the multicollinearity assumption is not met, the model possesses large standard errors and the coefficients cannot be estimated with great precision or accuracy (Gujarati & Porter, 2009). A Pearson correlation matrix and variance inflation factor (VIF) were used in the present study to identify the presence of multicollinearity. The VIF shows how the variance of an estimator is inflated by the presence of multicollinearity. As a rule of thumb, if the VIF

of a variable exceeds 10, that variable is said to be highly collinear (Gujarati & Porter, 2009). In the present study there was no multicollinearity amongs the regressors included in the various regression models.

4.9.8 Normality

For multiple regression analysis, normality tests are used to determine whether the disturbance term, namely the random error in the relationship between the independent variables and the dependent variable in a regression model, is well-modelled by a normal distribution. This was tested in the present study by investigating the standardised residuals and applying the Jarque-Bera test of normality, which is an asymptotic (large-sample) test. It first computes the skewness and kurtosis measures, and then uses them to calculate the Jarque Bera statistic. The statistic is computed as follows:

$$Jarque - Bera = \frac{N}{6} \left(S^2 + \frac{(K - 3)^2}{4} \right) \quad (4.7)$$

where

- S is the skewness; and
- K is the kurtosis.

It should be noted that different formulas are used for kurtosis by software tools (Westfall, 2014). From the calculation in EViews, as presented with Equation 4.7, a value of 3 needs to be subtracted to obtain the final kurtosis value. According to Gujarati and Porter (2009), for normally distributed variables, the skewness value should be 0 and the kurtosis value should be 3. However, most guidelines (George & Mallery, 2003) indicated a range of between -2 and +2 for skewness and kurtosis values for which the normal distribution of the variable can be assumed. However, Byrne (2001) and Kline (2011) stress that a kurtosis value ranging between -7 and +7 can be accepted.

In the present study, the disturbance term was normally distributed in the various regression models.

4.10 ASSUMPTION AND LIMITATION

Although annual financial statements are audited by external parties, they are still subject to managerial discretion and assumptions. However, for the purposes of this study, the annual financial statements are regarded as true and accurate.

4.11 ETHICAL CONSIDERATIONS

The financial data and integrated reports, as used in this study, are freely available to the public. The integrated reports were scrutinised with caution to ensure that the correct information was documented before the statistical analyses were performed.

4.12 CONCLUSION

This chapter presented the methodology used to conduct the research. The research methods in the present study are deemed suitable to achieve the research objectives, and the empirical models developed in Section 4.8 are appropriate to address the hypotheses. Specification tests as described in Section 4.9 were performed to ensure the robustness of the results. The next chapter presents the results and a discussion of the statistical procedures performed to address the research objectives.

CHAPTER 5: RESEARCH FINDINGS ON THE VALUE RELEVANCE OF GOODWILL

5.1 INTRODUCTION

The first hypothesis of this study requires determining whether goodwill is value relevant. In the discussion in this chapter, the results relating to this particular hypothesis are considered in detail. The discussion is divided into the following main areas: descriptive statistics, correlation analysis, assumption testing, and panel regression analysis. The chapter concludes with robustness testing and a summary of the findings.

5.2 DESCRIPTIVE STATISTICS OF ALL VARIABLES USED TO DETERMINE THE VALUE RELEVANCE OF GOODWILL

Descriptive statistics were performed for 300 sample firm-years; the results are detailed in Table 5.1. The final sample consisted of 106 firms and 12 years, which equals 1 272 firm-year observations, of which six were missing within the sample period. All six could be ascribed to financial year-end changes. To ensure that the data panel was balanced, replacement for the missing values was considered. Upon investigation of the individual observations, it was noted that the values of the preceding and following years of the particular missing value were very similar, and hence the mean value of these two years for a particular variable was used to replace each of the missing values.

For the regression analysis, all the variables were scaled by the number of shares outstanding. This is considered the most reliable method, because it compensates for incorrect inferences as a result of scale effects (Barth & Clinch, 2009). This approach was also followed by Bepari and Mollik (2017), Chalmers *et al.* (2008), and Zining *et al.* (2011). This method has the advantage that it can mitigate problems associated with heteroscedasticity (Dahmash *et al.*, 2009) – see Section 5.4.3.

Table 5.1: Descriptive statistics of all variables to determine the value relevance of goodwill

	N	Mean	Median	Standard deviation	Minimum	Maximum	Skewness	Kurtosis
MVE ZAR million	1 272	54 859	4 871	341 351	4	6 749 036	14.28	234.75
MVEPS ZAR	1 272	196	26	1 972	0.02	43 221	18.47	371.84
BVE ZAR million	1 272	16 896	2 089	66 849	-2 593	1 007 628	8.99	100.48
BVEPS ZAR	1 272	31.43	11.85	54.13	-26.46	477.47	4.13	22.78
NI ZAR million	1 272	2 313	292	12 226	-91 259	175 699	7.53	90.99
NIPS ZAR	1 272	4.78	1.80	11.28	-58.10	138.28	4.1	37.55
GW ZAR million	1 272	1 617	113	5 121	0	50 935	5.41	33.49
GWPS ZAR	1 272	4.36	1.22	8.39	0	138.28	4.42	27.13

Key to variables:

MVE	Market value of equity, 3 months after reporting date
MVEPS	Market value of equity per share, 3 months after reporting date
BVE	Book value of equity
BVEPS	Book value of equity per share
NI	Net income from continuing operations
NIPS	Net income from continuing operations per share
GW	Goodwill
GWPS	Goodwill per share

Source: Author's analysis

As Table 5.1 shows, the sample firms were relatively large in terms of their market value, with a mean market value of equity of ZAR 54 859 million during the sample period. The median value was significantly smaller, at ZAR 4 871 million, suggesting that the data were skewed to the right. This trend is commonly found when financial data are used (Nolan, 2003). The data used in the present study covered a wide spectrum of South African firms; the market capitalisation for the total sample ranged from a minimum of ZAR 4 million to a maximum of ZAR 6 749 036 million. The difference between these values suggests a large dispersion of firms in terms of their size. The maximum value of market value of ZAR 6 749 036 million in relation to the

mean market value of ZAR 54 859 million also suggests that there might have been extreme outliers. Outliers can substantially alter the results of a regression analysis (Gujarati & Porter, 2009) – see Section 5.4.1. It is evident from Table 5.1 that size varied significantly between the observations. To control for size, the natural logarithm of the previous year's assets was included in the regression model. This is consistent with previous studies performed by AbuGhazaleh *et al.* (2011) and Beatty and Weber (2006).

As with the market value of equity, the book value of equity also contained the potential risk of outliers, with a mean value of ZAR 16 896 million and a much lower median of ZAR 2 089 million. The minimum value of book value of equity, which was -ZAR 2 593 million, indicates that for some firms the total liabilities exceeded the total assets, which gave rise to a negative book value. This implies an MTB value of less than 1, which, according to Kabir *et al.* (2017), suggests that goodwill should be impaired. If goodwill was not impaired, goodwill may have been overstated. (This was investigated further in testing for the second hypothesis, as discussed in Chapter 6, where reasons for goodwill impairment were investigated.)

The mean value of net income, ZAR 2 313 million, and the median value, ZAR 292 million, confirmed that the data were skewed to the right. Even though an economic variable such as net income is expected to be uneven across a sample of firms, skewness in the distribution of one or more regressors is a source of heteroscedasticity (Gujarati & Porter, 2009). This problem was addressed in Section 5.4.3 as part of the assumption testing. The minimum value of -ZAR 91 259 million appeared to be reasonable, as it represented the net loss over a particular period. These extreme values were also investigated further as part of the assumption testing in Section 5.4.1.

The maximum value of goodwill was ZAR 50 935 million, and the minimum was ZAR 0, which further confirmed the large dispersion of firms in terms of size. The minimum value of goodwill as ZAR 0 was expected, because some firms impaired their total goodwill only during a particular year, resulting in a goodwill balance of zero in that year. The selection criteria for the sample included firms that had a goodwill balance for any one or more years of the sample period. Upon further investigation, it was noted that of the total goodwill values, 208 cases were zero. To adjust for the zero

goodwill balance, a new variable $GWPSex0$, was created in SPSS to exclude all the zero values in the regression.

High levels of skewness and kurtosis were observed for all the variables in the regression. However, linear panel regression modelling only required the residuals to be normally distributed, not the variables in the equation.

The next section investigates the degree of a linear relationship between variables.

5.3 PEARSON CORRELATION ANALYSIS OF ALL VARIABLES USED TO DETERMINE THE VALUE RELEVANCE OF GOODWILL

The results of the Pearson analysis for the sample period are tabulated in Table 5.2.

Table 5.2: Pearson correlation analysis of variables to determine the value relevance of goodwill

	<i>MVPS</i>	<i>BVEexGWPS</i>	<i>NIPS</i>	<i>GWPSex0</i>	<i>InSIZE_{t-1}</i>
<i>MVPS</i>	1				
<i>BVEexGWPS</i>	0.105**	1			
<i>NIPS</i>	0.069*	0.633**	1		
<i>GWPSex0</i>	0.054	0.337**	0.240**	1	
<i>InSIZE_{t-1}</i>	0.069*	0.565**	0.335**	0.388**	1

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

<i>MVPS</i>	Market value of equity per share, 3 months after reporting date
<i>BVEexGWPS</i>	Book value of equity, excluding goodwill, per share
<i>NIPS</i>	Net income from continuing operations per share
<i>GWPSex0</i>	Goodwill per share, excluding zero values
<i>InSIZE_{t-1}</i>	Natural logarithm of previous year's assets

Source: Author's analysis

Statistical significant correlation coefficients between the dependent variable and the book value of equity at the 1% level (using two-tailed significance), and net income and size at the 5% level, is evident from Table 5.2. Positive correlations between market value equity and book value of equity and net income have been found in prior research (Bepari & Mollik, 2017).

Regressors that are used in the same regression should not have high correlation coefficients, as it may raise concerns about multicollinearity, which occurs when there is a linear relationship between two or more independent variables entering the same

model. The highest Pearson correlation coefficient between two independent variables entering into the model is 0.7 (between *BVEexGWPS* and *NIPS*). In order to ensure that no multicollinear variables were used in the same regression analysis, variance inflation factors were observed, and these ranged between 1.16 and 1.48. These values were well below the benchmark value of 10 suggested by Burns and Burns (2008), implying that for this analysis multicollinearity was not a concern.

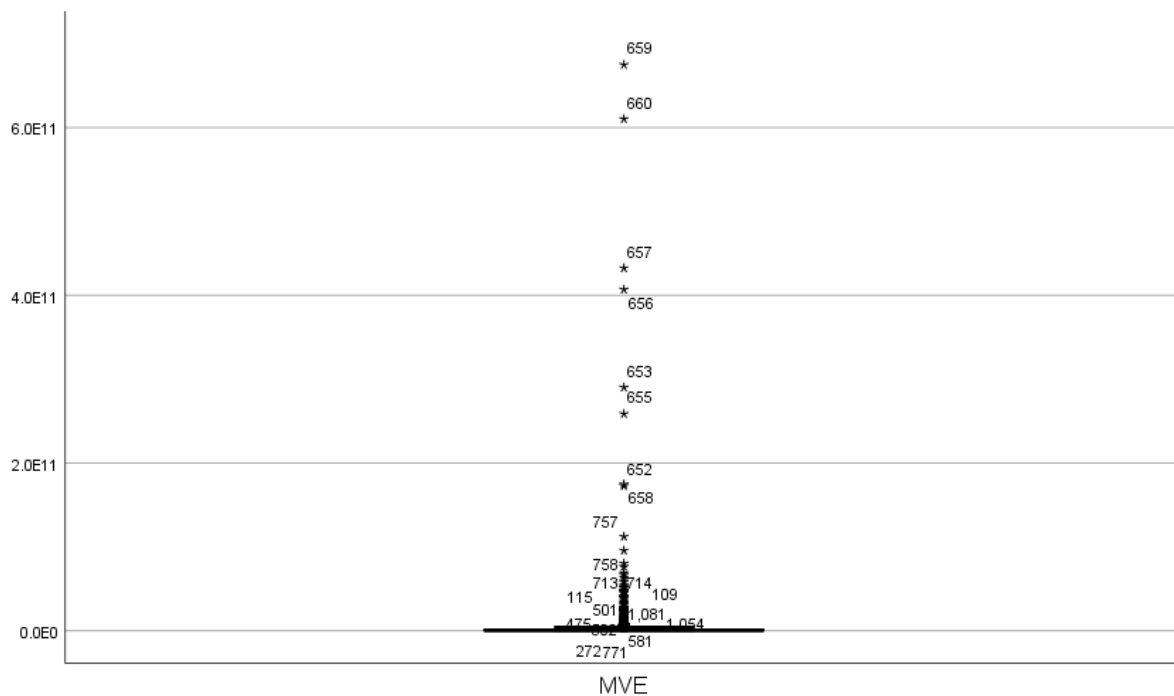
5.4 TESTING OF ASSUMPTIONS IN THE DATA SAMPLE USED TO DETERMINE THE VALUE RELEVANCE OF GOODWILL

In this section, the results of the assumption testing are detailed. Certain assumptions have to be met in order to ensure valid regression models. The assumption tests are grouped into subsections according to the fundamentals which they address.

5.4.1 Extreme outliers

From the initial descriptive statistics of the variables set out in Table 5.1, some non-normality was revealed in the data distributions, with instances of kurtosis and skewness levels outside of the normal tolerance levels. These abnormal values were investigated, and it was found that market value had some extreme outliers. Outliers were identified and the extreme cases were compared to the mean and median of the particular variable. In Figure 5.1, overleaf, the extreme cases of MVE that were identified and investigated are evident.

Figure 5.1: Extreme values: Market value variable to determine the value relevance of goodwill

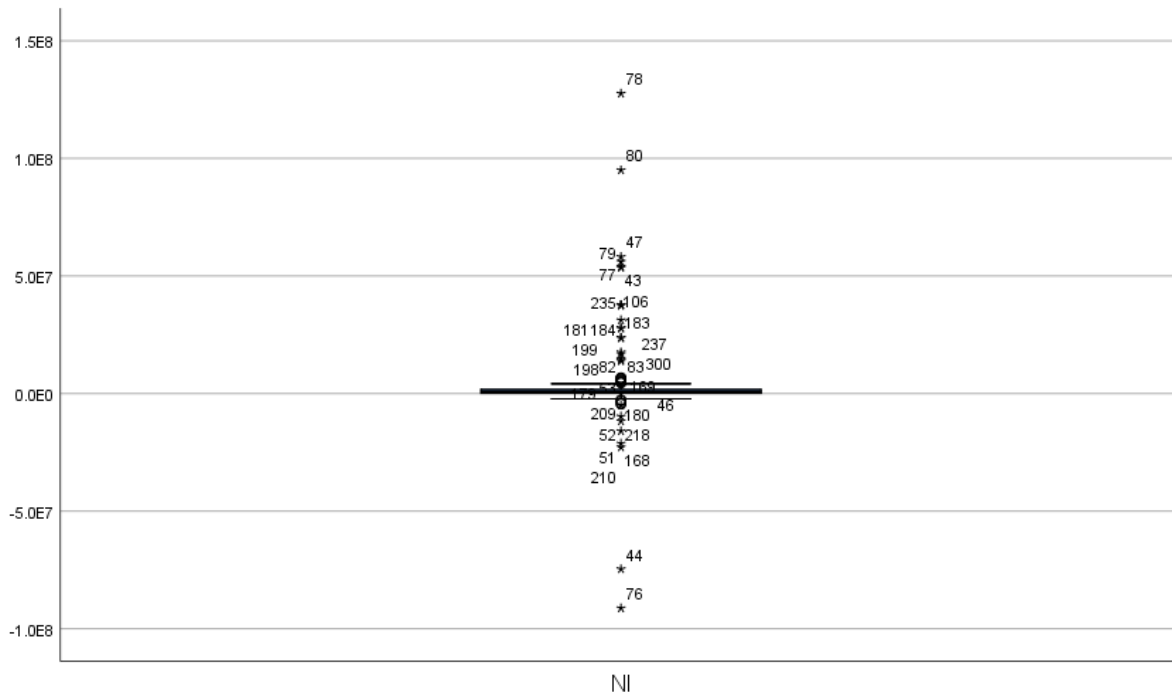


Source: Author's analysis

From Figure 5.1 it is clear that the following cases were extreme outliers (from the highest point downwards): 659, 660, 657, 656, 653, 655, 652 and 658. Upon further investigation, it was noted that all of these cases were the market values for a company named Lonmin. In August 2012, what has since been named the Marikana tragedy occurred at this mine, when labour unrest in the mining industry turned into a violent confrontation between the police and protesters, resulting in the deaths of 34 mine workers (Marinovich, 2012). This event led to in an unprecedented decrease in Lonmin's market value. For this particular data period, the decrease amounted to 99.9% (from the highest in 2007, at ZAR 674 903 million, to the lowest in 2017, at ZAR 741 million).

The descriptive statistics presented in Table 5.1 clearly show the risk of potential outliers for variable net income. From Figure 5.2, overleaf, the extreme values for net income were identified and these were investigated.

Figure 5.2: Extreme values: Net income variable to determine the value relevance of goodwill



Source: Author's analysis

Cases 76, 44 and 210 appeared to be extreme outliers and were investigated further. Case 76 related to Anglo American in 2012 (-ZAR 91 259 million), Case 44 related to BHP Billiton in 2015 (-ZAR 74 634 million), and Case 210 related to Netcare Limited in 2012 (-ZAR 22 817 million). The 2012 loss for Anglo American arose from a delay in one of the company's key projects. The loss incurred by Netcare, also in 2012, may be blamed on a subsidiary property company situated in the UK. Upon investigation of the BHP Billiton annual financial report for 2015, it was found that the large loss came about as a result of a decline in commodity prices and a loss recognised from discontinued operations.

To reflect the distributions of the majority of the data, the data were winsorized. All the data below the 5th percentile were winsorized to the 5th percentile, and all the data above the 95th percentile were set at the 95th percentile. This is consistent with similar studies performed in the financial field, with specific reference to value relevance studies (Bugeja & Loyeung, 2015; Chalmers *et al.*, 2011).

5.4.2 Stationarity of variables

To ensure that variables used in the model were non-stationary, unit root tests were performed. Contradictory results were found for the various individual unit root tests. As mentioned in Section 4.9.3, in the event of a short time span (12 years or less), stationarity of variables may be a problem, and this study covered 12 years. Contradictory results from the various unit root tests are a typical outcome in the event of a short time span with a large number of observations (Kao, 1999).

The three-unit roots tests performed assuming individual unit root process (the Im, Pesaran and Shin, Augmented Dickey-Fuller and Phillips-Perron tests) did indeed present contradictory results. This may be ascribed to the short sample period (2006 – 2017) consisting of 12 years, and the fact that 1 272 firm-year observations were included in the sample, as was explained in Section 4.6.

With individual unit root testing, a unit root is tested by testing for the presence of a unit root, whereas with common root testing, the common factor is introduced in order to test for cross-section dependence of the stationary components (Pesaran, 2007). According to the results presented in Table 5.3, overleaf, all the variables are non-stationary. However, according to the Levin, Lin, and Chu (2002) test, which assumes a common unit root process, all the variables were stationary. A common unit root process assumes that the auto regression of all the variables are similar. The test assumes that each individual unit in the panel shares the same AR(1) coefficient. This is a reasonable assumption, but it allows for individual effects, time effects and possibly a time trend. It also allows for lags of the dependent variable to be introduced to allow for serial correlation in the errors (Bornhorst & Baum, 2006).

Table 5.3: Unit root testing of variables used to determine the value relevance of goodwill

Variable	Levin, Lin and Chu test
<i>MVEPS</i>	-19.89**
<i>NIPS</i>	-28.20**
<i>BVEexGWPS</i>	-17.29**
<i>GWPSex0</i>	-88.89**
<i>lnSIZE_{t-1}</i>	-9.55**

** denotes significance at <0.01 (two-tailed)

Key to variables:

MVEPS Market value of equity per share, 3 months after reporting date

NIPS Net income from continuing operations per share

BVEexGWPS Book value of equity, excluding goodwill, per share

GWPSex0 Goodwill per share, excluding zero values

lnSIZE_{t-1} Natural logarithm of previous year's assets

Source: Author's analysis

Based on the results presented in Table 5.3, all the variables were non-stationary.

5.4.3 Heteroscedasticity

Heteroscedasticity was addressed by investigating whether the residuals were normally distributed. This test was performed for each of the regressions performed. In order to obtain robust standard errors, panel-corrected standard error (PCSE) can be used in the final regression. 'PCSE preserves the weighting of observations for autocorrelation, but uses a sandwich estimator to incorporate cross-sectional dependence when calculating standard errors' (Moundigbaye, Rea, & Reed, 2018:2). The residuals were found to be normally distributed – see Figure 5.3.

5.4.4 Endogeneity

Endogeneity occurs when an independent variable is correlated with the error term. This can be the result of omitted variables, or unobserved heterogeneity. The model used to test H_1 was also used in previous studies (see Chalmers *et al.*, 2008; Lee *et al.*, 2014). The present study reduced the risk of endogeneity by incorporating an additional independent variable, namely the size of a firm. From the descriptive statistics in Table 5.1, it was clear that there was a dispersion of firms in terms of firm size, and the market value could be influenced by the size of a firm. To control for this, the size of a firm was included in the regression as a control variable. Potential

heterogeneity was addressed by using an error-variance covariance matrix in the framework of seemingly unrelated regression and cross-section weights.

5.5 MULTIVARIATE REGRESSION FINDINGS TO DETERMINE THE VALUE RELEVANCE OF GOODWILL

Panel least squares regression was performed to test H_1 . Three different regressions were performed. The results are presented below.

5.5.1 Initial panel least squares regression to determine the value relevance of goodwill

The first regression performed was the ordinary panel least squares regression, without any adjustments to the model. These initial results indicated strong autocorrelation within firms and over time. The initial regression results are shown in Table 5.4. The predicted sign column indicates the direction of the relationship which was expected on the basis of the literature and the hypothesis formulation.

Table 5.4: Initial panel least squares regression results to determine the value relevance of goodwill using market value earnings per share as the dependent variable

$MVEPS = \alpha_0 + \beta_1 BVEPSexGWPS + \beta_2 NIPS + \beta_3 GWPSex0 + \alpha_1 \ln SIZE_{t-1}$ (4.2)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	-12318.70	-10.17**
<i>BVEPSexGWPS</i>	+	27.24	6.91**
<i>NIPS</i>	+	154.05	10.01**
<i>GWPSex0</i>	+	184.91	8.60**
<i>lnSIZE_{t-1}</i>	+	1022.65	12.42**
R ²	0.52		
Adjusted R ²	0.52		
Durbin-Watson	0.4		
F-statistic	261.85**		

** denotes significance at <0.01 (two-tailed)

Key to variables:

BVEPSexGWPS Book value of equity, excluding goodwill, per share

NIPS Net income from continuing operations per share

GWPSex0 Goodwill per share, excluding zero values

lnSIZE_{t-1} Natural logarithm of previous year's assets

Source: Author's analysis

Based on preliminary investigations, the results indicated that the model explained 52% of the variance in the dependent variable. As predicted, all the coefficients were positive, indicating that the book value of equity, net income and goodwill were associated with market value. The coefficient of book value excluding goodwill (*BVEPSexGWPS*) was 27.24, the coefficient of net income was 154.05, and the coefficient of goodwill was 184.91. Therefore, all the independent variables were value relevant. The F-test of the regression model was statistically significant, indicating that all of the coefficient values differed from 0. Residuals were normally distributed, based on the skewness value of 0.4 and kurtosis of 3.5. All the independent variables were found to be significant predictors of the dependent variable.

However, the Durbin-Watson statistic (0.4) revealed serial correlation, indicating that the random errors were not independently distributed. In a panel OLS model with positive autocorrelation, the standard errors were underestimated and the t-test statistics overestimated, thus potentially identifying an independent variable as a statistically significant predictor when it is not.

Subsequently, the incorporation of fixed or random effects in the model was investigated. The Hausman (1978) test was performed to determine whether a fixed effect or random effects should be incorporated in the model. The results are presented in Table 5.5.

Table 5.5: Hausman test results to determine whether fixed or random effects should be incorporated in the model to determine the value relevance of goodwill

Test summary	Chi-Sq Statistic	Chi-Sq. d.f.	Prob
Cross-section random	29.53	4	0.000**

** denotes significance at <0.01 (two-tailed)

Source: Author's analysis

Based on these results, the null hypothesis of a random effect model could be rejected, and therefore a fixed effects model was employed. In Table 5.6, overleaf, the panel least squares regression with a fixed effects model is presented.

Table 5.6: Panel least squares regression with fixed effects results, to determine the value relevance of goodwill using market value earnings per share as the dependent variable

$MVEPS = \alpha_0 + \beta_1 BVEPS_{sex}GWPS + \beta_2 NIPS + \beta_3 GWPS_{sex0} + \alpha_1 \ln SIZE_{t-1}$ (4.2)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	-12810.24	-5.29**
<i>BVEPS_{sex}GWPS</i>	+	11.15	3.14**
<i>NIPS</i>	+	79.84	6.75**
<i>GWPS_{sex0}</i>	+	129.12	5.82**
<i>lnSIZE_{t-1}</i>	+	1112.09	12.42**
R ²	0.82		
Adjusted R ²	0.80		
Durbin-Watson	0.84		
F-statistic	37.54**		

** denotes significance at <0.01 (two-tailed)

Key to variables:

BVEPS_{sex}GWPS Book value of equity, excluding goodwill, per share

NIPS Net income from continuing operations per share

GWPS_{sex0} Goodwill per share, excluding zero values

lnSIZE_{t-1} Natural logarithm of previous year's assets

Source: Author's analysis

The fixed effect panel regression results indicate that this model had 80% explanatory power. As with the initial panel regression results presented in Table 5.4, all the independent variables were significant predictors of market value. The respective coefficients were 11.15 for *BVEPS_{sex}GWPS*, 79.84 for *NIPS* and 129.12 for *GWPS_{sex0}*, all significant at the 1% level of significance. However, even with the fixed effects incorporated in the model, the Durbin-Watson statistic (<1) remained low and indicated the presence of serial correlation. The residuals were normally distributed with a skewness value of 0.77 and kurtosis of 3.61.

The panel least squares method assigns equal weight or importance to each observation. It would be ideal to devise the estimating scheme in such a manner that observations coming from populations with greater variability are given less weight than those coming from populations with smaller variability. A method of estimation that takes such information into account explicitly is known as the EGLS estimator (Gujarati & Porter, 2009). Furthermore, the use of EGLS is advised when heteroscedasticity and autocorrelation problems are present in the data. The EGLS

estimator was used and therefore the heterogeneity and autocorrelation concern was addressed, as discussed in the next section.

5.5.2 Estimated generalised least squares (EGLS) method of estimation to determine the value relevance of goodwill using market value earnings per share as the dependent variable

Using panel EGLS, specific estimation methods were specified to address the heterogeneity and autocorrelation concern. According to Moundigbaye *et al.* (2018) Moundigbaye, Rea, and Reed (2018), there is an abundance of possible regression estimators from which one can choose in panel data. The error-variance covariance matrix was modelled in the framework of seemingly unrelated regressions, using the period seemingly unrelated regression (SUR) approach. Other approaches, such as cross-sectional dependencies and cross-sectional correlation as a function of time-specific common factors, are prone to misspecification errors. The period SUR approach is known to correct for period heteroscedasticity as well as the general correlation of observations within a cross-section (IHS Global Inc, 2013). The SUR specifications are an example of what is sometimes referred to as the Parks estimator, and despite the existence of more recent alternatives, the Parks estimator continues to be helpful to applied researchers (Moundigbaye *et al.*, 2018). However, one problem with this model is that a large number of parameters need to be estimated when the number of periods is less than the number of observations. This can cause severe underestimation of coefficient standard errors, resulting in invalid hypothesis testing. To address this problem, a modification of the estimator, namely the PCSE, can be incorporated, as proposed by Beck and Katz (1995). PCSE preserves the weighting of observations for autocorrelation, but uses an estimator to incorporate cross-sectional dependence in the calculation of standard errors (Moundigbaye *et al.*, 2018). Table 5.7, overleaf, presents the results of the regression with period SUR as a weighting estimate, and PCSE as an error variance covariance.

Table 5.7: Panel EGLS regression results to determine the value relevance of goodwill using market value earnings per share as the dependent variable

$MVEPS = \alpha_0 + \beta_1 BVEPS_{exGWPS} + \beta_2 NIPS + \beta_3 GWPS_{ex0} + \alpha_1 \ln SIZE_{t-1}$ (4.2)			
Variable	Prediction sign	Coefficient	t-Statistic
C	+/-	-13534.91	-10.10**
$BVEPS_{exGWPS}$	+	31.43	4.99**
$NIPS$	+	87.41	5.71**
$GWPS_{ex0}$	+	138.96	4.17**
$\ln SIZE_{t-1}$	+	1144.21	11.25**
R ²	0.41		
Adjusted R ²	0.41		
Durbin-Watson	1.59		
F-statistic	168.97**		

** denotes significance at <0.01 (two-tailed)

Key to variables:

$BVEPS_{exGWPS}$ Book value of equity, excluding goodwill, per share

$NIPS$ Net income from continuing operations per share

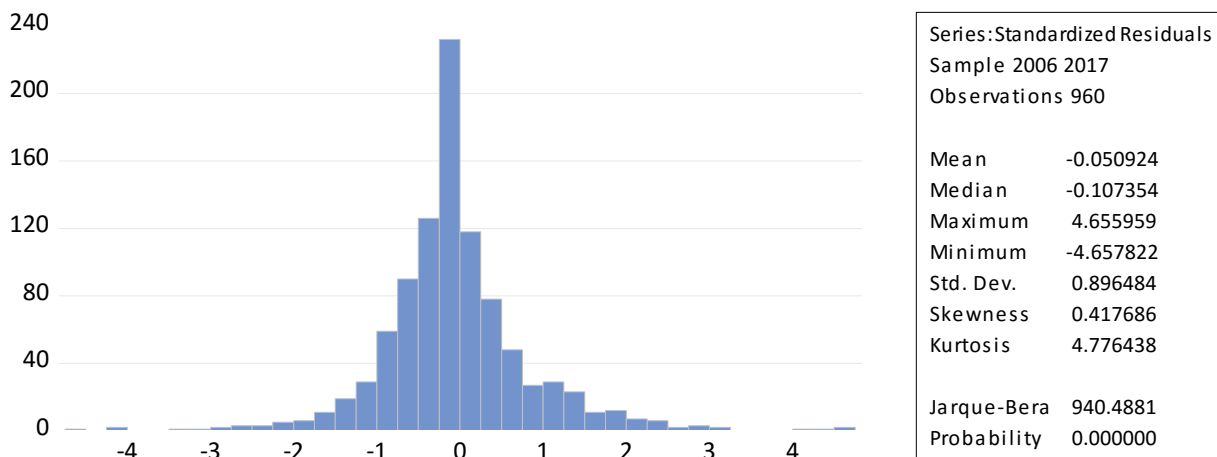
$GWPS_{ex0}$ Goodwill per share, excluding zero values

$\ln SIZE_{t-1}$ Natural logarithm of previous year's assets

Source: Author's analysis

Once the period SUR and PCSE were incorporated into the estimation, no severe autocorrelation was found, as indicated by the Durbin-Watson statistic (>1.5). The graphical analysis of the residuals (see Figure 5.3) shows that the residuals were not heteroscedastic and did not exhibit significant skewness, and that they were approximately normally distributed. In Table 5.7 the signs of all the independent variables were positive, and all were significant at a 1% level. The adjusted R² suggests that the independent variables could explain 41% of the variance in market value. The F-test of the regression model was statistically significant, indicating that all the coefficient values differed from 0. The residuals were normally distributed, as is shown in Figure 5.3.

Figure 5.3: Standardised residuals using the Jarque-Bera test to determine normal distribution



Source: Author's analysis

The Jarque-Bera test was considered to determine whether the series were normally distributed. The Jarque-Bera test did not indicate multivariate normality ($p > 0.05$), but, according to Alejo, Galvao, Montes-Rojas, and Sosa-Escudero (2015), the standard Jarque-Bera test is not able to disentangle the departures of the individual and remainder components from non-Gaussianity. In the residual testing presented in Section 6.5.3, Section 7.2.4.2 and Section 7.3.4.4, the same logic was followed and the Jarque-Bera statistic was disregarded for the standardised residual testing. Therefore, the residuals were examined based on the skewness (0.41) and kurtosis (4.77) values and these values indicate that the assumptions were reasonably met, as they are within the acceptable range as discussed in Section 4.9.8.

As may be predicted from the correlations in Table 5.1, the multivariate regression reported on in Table 5.7 confirms that all the independent variables were clear predictors of the dependent variable. The regression tests the value relevance of book value excluding goodwill (*BVEPSexGWPS*), net income (*NIPS*) and goodwill (*GWPSex0*). Strong support was thus found for H_1 : the coefficient of *BVEPSexGWPS* was 31.43, that for *NIPS* was 87.41 and that for *GWPSex0* was 138.96, and all these variables were significant at the 1% level. The significance of book value of equity and net income was expected in line with the original Ohlson (1995) model findings. Similar findings were reported by Barth, Beaver, and Landsman (2001) and Lee *et al.* (2014). Book value of equity and net income were also significant predictors of market value in Beisland and Knivsflå's (2015) study, who also found, however, that the value

relevance of net income decreased as fair value measurement increased in the period after the adoption of *IFRS 3*. Beisland and Knivsflå (2015) argue that their findings show that the effects of IFRS adoption on value relevance may be highly sensitive to firm characteristics such as size. In the present study, this potential risk was addressed by including a control variable for size. The results, set out in Table 5.7, show that size was positively associated with goodwill (1144.21, $p < 0.01$), which could suggest that larger firms possess superior managerial expertise and resources to apply the complex accounting standard set out in *IFRS 3*. The accounting team of a larger firm is likely to be comprised of highly skilled employees with the ability to ensure that the annual financial statements are reliable. Focusing on the period after the adoption of *IFRS 3*, the present study has thus provided evidence that the book value, net income and goodwill of large South African firms reflect information that investors deem relevant.

Both the net income and goodwill variables appeared to be significant predictors of the market value of South African firms. Although these are two very different variables, there is an important link between them. *IAS 36* requires firms to determine the recoverable amount of goodwill by using the value in use or fair value minus cost to sell method. With the value in use calculation, various variables are used, including future operating cash flow projections. The future operating cash flow calculations are based on the current year's net income adjusted by a suitable growth rate. Therefore, the current year's net income forms an integral part in the goodwill impairment calculations when the value of use method is used to determine the recoverable amount. Further investigation revealed that of the 300 firms that recorded goodwill impairment during the sample period, 255 firms (85%) used the value in use method to determine the value of goodwill. Therefore, the majority of JSE-listed firms in the sample applied the value in use method and relied on future operating cash flow projections to calculate goodwill and its impairment. This could suggest that investors rely on the net income figure and assume that future operating cash flow predictions are accurate. There is a risk that, because *IAS 36* allows managers to use substantial discretion in determining whether goodwill is impaired or not, this can result in a decrease in the informativeness of goodwill. However, even though such cash flow projections are based on estimates by management, the results of the present study do not indicate a potential risk of agency cost.

The literature suggests that goodwill was not value relevant in a pre-*IFRS 3* setting (Chalmers *et al.*, 2008; Ravlic, 2003), implying that annual amortisation is not the best way to account for goodwill. The results of the present study thus contribute to the literature investigating goodwill in a setting after the adoption of *IFRS 3*, and it confirms that the goodwill impairment regime reflects the underlying economic value of goodwill better. These findings are consistent with those of Bepari and Mollik (2017), Chalmers *et al.* (2011) and Eloff and De Villiers (2015), because the present study has provided evidence that the IASB has met its objectives in issuing *IFRS 3*, namely to enhance the relevance and reliability of the information, including information on goodwill, provided to users of financial statements.

Consistent with the first hypothesis, the coefficient for goodwill was found to be significantly greater than one, indicating that the market believes goodwill to be value relevant. Bepari and Mollik (2017) explain that if managers are allowed adequate flexibility by accounting standards (as under *IAS 36*) rather than bound by a systematic and mechanistic rule (such as the requirement to amortise goodwill under *IAS 22*), the information value of the accounting measurement may improve. The findings of the present study contribute to the debate on whether rule-based accounting standards are better than principle-based ones, or vice versa, by providing evidence in favour of principle-based accounting standards. The results suggest that investors prefer managers to have adequate flexibility in applying judgements rather than to be subject to rules embedded in narrow conservatism. This makes sense, because, by definition, goodwill is subject to managerial discretion, since the value is determined by the purchase price of a target firm and the market value. If the purchase price is not considered at arm's length and potential overpayment occurs, goodwill will be overvalued.

The findings of the present study suggest that goodwill conveys useful information to investors, and that investors do not deem goodwill to be incorrectly valued. Barth, Beaver, and Landsman (2001) are of the opinion that value-relevance studies provide valuable insights for standard setters. In the present study, the Ohlson (1995) model was used to test for value relevance. The model incorporates a balance sheet approach, ensuring that the application of *IFRS 3* can be evaluated as a whole. Although a number of prior studies found goodwill to be value relevant in the period

since the adoption of *IFRS 3* (Bepari & Mollik, 2017; Chalmers *et al.*, 2011), another study could not find evidence to support this claim (Li & Sloan, 2015), possibly because Li and Sloan's (2015) study included only the first two years of implementation of the impairment approach. During the first few years of any accounting standard change, preparers of financial statements are still accustoming themselves to the new requirements. Chalmers *et al.* (2008) show that the balance sheets lost information content regarding identifiable intangibles but gained content regarding goodwill. These findings support the IASB's termination of the mechanical straight-line amortisation of goodwill approach.

In summary, the multivariate regression results of the present study suggest that goodwill reported under *IFRS 3* is value relevant and does offer information content. Therefore, it appears that investors use the equity-accounted carrying amounts, net income and goodwill to develop their assessment of the intrinsic value of an entity. In terms of the definition by Li, Zhang, Zhang, and Jia (2015), goodwill represents the potential value of a firm's ability to adapt to market development and also embodies the firm's core competitiveness. Goodwill as an intangible asset represents a future benefit; therefore it should be appropriately measured and managed. However, despite the fact that better information content (superior disclosures) and write-offs of goodwill must be reported under *IFRS 3*, users of the financial statements should take into consideration that management uses its discretion in determining the value of goodwill. The present study acknowledges this limitation and therefore incorporated further testing to determine the quality of disclosure of financial statements, with specific reference to goodwill and its impairment.

5.5.3 Robustness of the regression

To determine whether the final regression as presented in Section 5.5.2 was robust, permutation tests were performed. A permutation test (also referred to as a randomisation test) is a type of statistical significance test in which the regression is performed on random samples of the total population. For the purposes of this study, ten random samples were created in SPSS using approximately 50% of the total sample. For each of these random samples, the final regression was performed. For nine of these samples, all the coefficients were significant predictors of the dependent variable, consistent with the final regression findings documented in Section 5.5.2. For

the remaining random sample, one of the independent variables (book value excluding goodwill) was insignificant. However, all the other variables were significant. Because of space constraints, the detailed results are not included in this document, but can be obtained from the author upon request. The majority of the permutations testing coincided with the final regression; therefore, the final regression was accepted as robust.

5.6 SUMMARY AND CONCLUSION

This chapter has presented the detailed findings regarding the first hypothesis, which posits that reported goodwill is value relevant. The first objective of this study is aimed at determining the impact of goodwill on firm value and whether it is relevant to the decision-making of South African equity investors.

The findings from the multivariate regression indicate that the book value of equity, net income and goodwill are all value relevant, based on the significance of regression coefficients. Therefore, H_1 , namely that reported goodwill is value relevant, is supported. Although this study only focuses on the period after the adoption of *IFRS 3*, it confirms the view that goodwill is value relevant under the impairment regime. The findings of this chapter are robust to the model specifications.

In the next chapter, the results regarding the second hypothesis are addressed.

CHAPTER 6: RESEARCH FINDINGS ON THE DETERMINANTS OF GOODWILL IMPAIRMENT DECISIONS

6.1 INTRODUCTION

The second hypothesis of this study, H_2 , relates to the reasons why firms impair goodwill, as it states that *there are statistically significant determinants of goodwill impairment decisions*. The detailed discussion in this chapter sets out the results that address H_2 . The chapter is divided into the following main areas: the descriptive statistics, the results of the correlation analysis, assumption testing, and panel regression analysis. The chapter concludes with comments on the robustness testing and a summary of the findings.

6.2 DESCRIPTIVE STATISTICS OF THE VARIABLES TO IDENTIFY THE DETERMINANTS OF GOODWILL IMPAIRMENT DECISIONS

Descriptive statistics were performed for the sample firm-years, as shown in Table 6.1. The sample to test this particular hypothesis included the firms from the original sample that recognised goodwill impairment for one or more years during the sample period. Among the original 1 272 firm-year observations, there were 300 cases of goodwill impairments which are relevant to the testing of the second hypothesis. A content analysis was performed for the 300 sampled years.

As can be seen in Table 6.1, overleaf, however, there were not 300 observations for each of the variables. The dummy variable indicating whether there was a change in CEO (*CEOCHANGE*) and the percentage of independent board members in relation to the total board members (*BINDEP*) only had 292 variables each. The number of board meetings held during the year (*BACTIVITY*) was 283. For these missing values, the information could not be obtained from the annual reports for that particular year. These values were therefore treated as missing values, as it did not make sense to replace them with any other value.

Table 6.1: Descriptive statistics of all variables to identify the determinants of goodwill impairment decisions

	N	Mean	Median	Standard deviation	Minimum	Maximum	Skewness	Kurtosis
<i>GIL</i> ZAR million	300	250	19.33	1 025	0	10 773	7.67	66.52
<i>CEOCHANGE</i>	292	0.15	0	0.355	0	1	1.99	1.99
<i>NI</i> ZAR million	300	2 556	653	14 273	-91 259	127 561	7.53	90.99
<i>ROA%</i>	300	9.469	9.884	15.095	-84.014	81.494	-18.91	434.69
<i>BINDEP</i>	292	0.513	0.5	0.186	0	0.929	-0.11	-0.41
<i>BACTIVITY</i>	283	5.55	5	2.508	0	21	2.74	12.07
<i>lnSIZE_{t-1}</i>	300	16.277	16.341	1.750	10.222	21.385	-0.19	0.08

Key to variables:

GIL Goodwill impairment

CEOCHANGE Indicator of whether there was a change in the CEO for the year

NI Net income from continuing operations

ROA% Return on assets for the year

BINDEP Percentage of independent directors to the total number of directors

BACTIVITY Number of board meetings during the year

lnSIZE_{t-1} Natural logarithm of previous year's assets

Source: Author's analysis

The minimum value of goodwill impairment was ZAR 12 000, reflected as zero in the table, as amounts were rounded off to the nearest million. As Table 6.1 shows, the dispersion of values was relatively large in respect of the goodwill impairment values, with a minimum value of ZAR 12 000 and maximum value of ZAR 10 773 million. With a sample size of 300, these values suggest that there were extreme outliers. The median value of goodwill impairment of ZAR 19 million was smaller than the mean value of ZAR 250 million, suggesting that the data were skewed to the right.

Similarly, the mean value of net income was ZAR 2 556 million, and the median value was ZAR 653 million. This trend is commonly found for financial data (Nolan, 2003). The minimum value of net income was -ZAR 91 259 million; the maximum value was ZAR 127 561 million. The negative net income suggests that a loss was made during the year, which was to be expected in a sample period of 12 years. However, the large negative value of the net income values may suggest outliers.

Further confirmation of outliers was evident from the ROA values, with a minimum percentage of -84.01% and a maximum of 81.49%. The negative ROA percentage was investigated and was found to relate to a firm with a negative net income, therefore

a negative ROA percentage was calculated. The extreme values are discussed in Section 6.4.1, showing the exclusions that were made.

The proportion of independent directors on the board ranged from 0% to 92.9%, with a mean of 51.3%. The number of board meetings per year (*BACTIVITY*) averaged 6, with a minimum number of one meeting per year and a maximum of 21. Further analysis (untabulated) indicated that 20 firms (7%) held more than 10 meetings per year and 7 firms (2%) held only two meetings per year.

High levels of skewness and kurtosis were observed for all the variables in the regression, but in linear panel regression modelling only the residuals are required to be normally distributed, not the variables in the equation. The distribution of residuals is considered in detail in Section 6.5.3.

6.3 CORRELATION ANALYSIS OF THE VARIABLES TO IDENTIFY THE DETERMINANTS OF GOODWILL IMPAIRMENT DECISIONS

Results of the Pearson analysis for the sample period are summarised in Table 6.2.

Table 6.2: Pearson correlation analysis of the variables to identify the determinants for goodwill impairment decisions

	<i>GIL</i>	<i>NI</i>	<i>ROA %</i>	<i>lnSIZE_{t-1}</i>	<i>CEO</i>	<i>BACTIVITY</i>	<i>ADD</i>	<i>BINDEP</i>
<i>GIL</i>	1							
<i>NI</i>	0.188**	1						
<i>ROA %</i>	-0.124*	0.241**	1					
<i>lnSIZE_{t-1}</i>	0.332**	0.260**	-0.038	1				
<i>CEO</i>	0.003	0.069	-0.043	0.140*	1			
<i>BACTIVITY</i>	0.105	0.108	-0.151*	0.438**	0.225**	1		
<i>ADD</i>	-0.025	0.035	0.230**	0.110	-0.105	-0.060	1	
<i>BINDEP</i>	0.239**	0.164**	-0.126*	0.534**	0.179**	0.349**	-0.056	1

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

GIL Goodwill impairment

NI Net income for the year

ROA % Return on assets for the year

lnSIZE_{t-1} Natural logarithm of previous year's assets

CEO Indicator of whether there was a change in the CEO for the year

BACTIVITY Number of board meetings during the year

ADD Variable indicating whether a firm had acquisitions during the financial year

BINDEP Percentage of independent directors to the total number of directors

Source: Author's analysis

As Table 6.2 shows, the correlation coefficients between the dependent variable (goodwill impairment) and net income, size and board independence were statistically significant at the 1% level (using two-tailed significance). The variable *ROA* was significant at the 5% level (using two-tailed significance). The highest correlations related to board independence, which was positively correlated with goodwill impairment (0.239), net income (0.164), *ROA* (-0.126), size (0.534), change in CEO (0.179) and the frequency of board meetings (0.349).

Regressors that are used in the same regression should not have high correlation coefficients, which would raise concerns regarding multicollinearity. Multicollinearity occurs when there is a linear relationship between two or more independent variables entering the same model. In the current study, the highest Pearson correlation coefficient between two independent variables entering into the same model was 0.435 (these variables were the frequency of board meetings and size). To ensure that no multicollinear variables were used in the same regression analysis, the VIFs were observed. They ranged between 1.08 and 1.64. These values are well below the benchmark of 10 (Burns & Burns, 2008), which implies that for this analysis multicollinearity was not present.

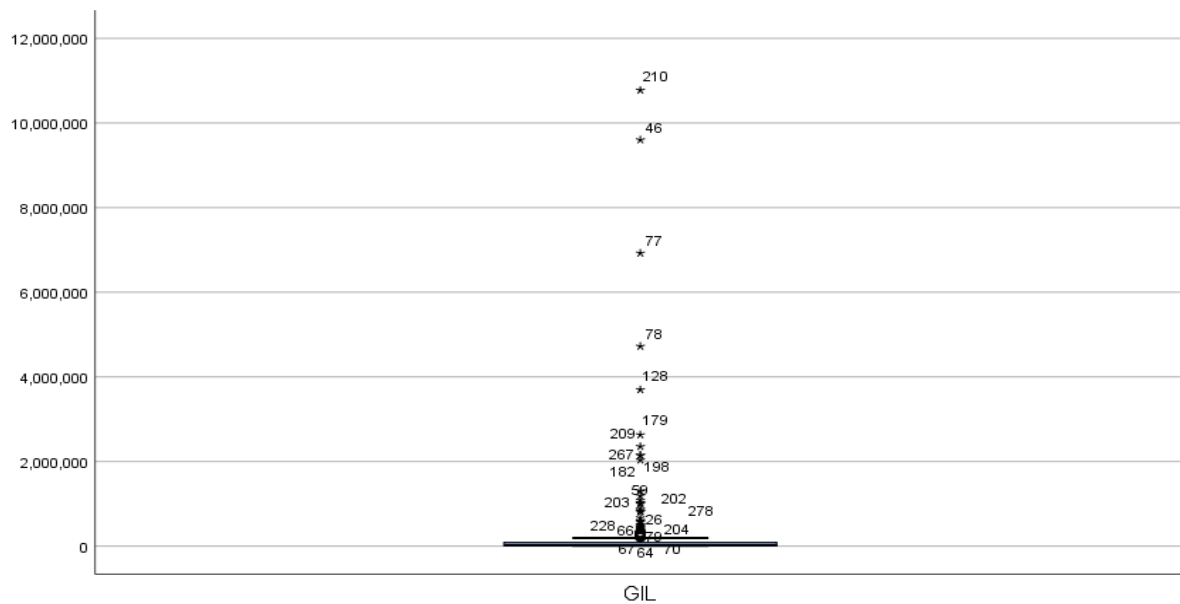
6.4 TESTING OF ASSUMPTIONS IN THE DATA SAMPLE TO IDENTIFY THE DETERMINANTS OF GOODWILL IMPAIRMENT DECISIONS

In this section, the results of the assumption testing are presented. Certain assumptions have to be met in order to ensure valid regression models. The assumption tests are grouped into subsections according to the fundamentals which they address.

6.4.1 Extreme outliers

The initial descriptive statistics of the variables set out in Table 6.1 revealed some non-normality in the data distributions, with instances of kurtosis and skewness levels outside the normal tolerance levels. Abnormal values were investigated. It was found that goodwill impairment and net income displayed some extreme outliers. Outlier detection was performed and the extreme cases were compared to the mean and median of the particular variables. The extreme cases of goodwill impairment shown in Figure 6.1 were identified and investigated.

Figure 6.1: Extreme values: goodwill impairment variables to identify the determinants of goodwill impairment decisions



Source: Author's analysis

Cases 210, 46 and 77 were identified as outliers. Case 210 relates to Netcare Limited in 2012, and Case 46 relates to Anglo American in 2012. The annual financial reports for these firm years were investigated. The goodwill impairment charge in 2012 by Netcare Limited could be traced to a subsidiary property company situated in the UK. The high debt levels of this business were negatively affected by the prevailing macroeconomic environment in the UK, and resulted in a large goodwill impairment. During 2012, Anglo American disclosed that one of its key projects, situated in Brazil (the Minas-Rio project), was behind schedule because of permit delays and legal challenges. Case 77 relates to BHP Billiton in 2015 (the net income for this particular sample year was also identified as an extreme outlier in Section 5.4.1) and the impairment relates to their discontinued operations. The three highest values of goodwill impairment, Cases 210, 46 and 77, as discussed above, were excluded from the final sample.

The extreme values for net income have already been considered in Section 5.4.1 under H_1 , which indicated that winsorization was applied to account for these extreme values. However, the sample used to test H_2 consisted of only 300 observations, which meant that a 5% winsorization would result in the loss of too many observations. The

extreme values were therefore investigated on a case by case basis, and only three cases were excluded, as discussed above.

6.4.2 Stationarity of variables

Unit root tests were performed to test for the stationarity of variables. As with the results in the testing of H_1 , contradictory results were identified between the different tests. This problem is typical for series with a short time span. For effective unit root testing, one requires both a large number of observations and a long time-span (more than 12 years). For the second hypothesis, the number of observations was small (300 observations) and a short-time span (12 years) applied, so contradictory results were to be expected.

The outcomes of stationarity tests may be biased with regard to cross-sectional dependence and a short time dimension. To address these potential issues, two stationarity tests were performed. The first generation test (Harris & Tzavalis, 1999), which assumes a lack of cross-section dependence and is most suitable for short and fixed time dimensions, was applied. Then, the second generation test (Pesaran, 2007), which assumes cross-section dependence but tending to infinity, was applied. In Section 5.4.2, the application of common unit root testing was discussed – it was used because of the large sample (1 272 observations). However, the sample of 300 used to test H_2 was smaller – hence the difference in the test methods applied.

The Pesaran (2007) test is based on the individual unit root and is appropriate for a small sample. The application of the Pesaran (2007) test showed that most of the variables were non-stationary, except for net income (NI) and board independence ($BINDEP$). To account for this non-stationarity, a panel error correction model was used, based on first differences: the results of the Phillips Perron (PP) – Fisher Chi-square unit root test are presented in Table 6.3.

Table 6.3: Fisher Chi-square unit root testing of independent variables to identify the determinants of goodwill impairment decisions using goodwill impairment as the dependent variable

Variable	PP – Fisher Chi-square
<i>GIL</i>	61.11**
<i>CEOCHANGE</i>	25.85**
<i>ROA%</i>	54.59**
<i>BACTIVITY</i>	35.96*
<i>ADD</i>	75.54**
<i>NI</i>	35.16
<i>DNI#</i>	72.83**
<i>BINDEP</i>	28.76
<i>DBINDEP#</i>	101.06**
<i>lnSIZE_{t-1}</i>	50.25**

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

denotes the first difference variable

Key to variables:

<i>GIL</i>	Goodwill impairment
<i>CEOCHANGE</i>	Indicator of whether there was a change in CEO for the year
<i>ROA%</i>	Return on assets for the year
<i>BACTIVITY</i>	Number of board meetings during the year
<i>ADD</i>	Variable indicating whether a firm had acquisitions during the financial year
<i>NI</i>	Net income for the year
<i>BINDEP</i>	Percentage of independent directors to the total number of directors
<i>lnSIZE_{t-1}</i>	Natural logarithm of previous year's assets

Source: Author's analysis

Based on the results presented in Table 6.3, all the variables were non-stationary.

6.4.3 Heteroscedasticity

Heteroscedasticity was addressed by investigating whether the residuals were normally distributed. This analysis was performed for each of the regressions. As has already been explained in Section 5.4.3, cross section weights (PCSE) can be used in the final regression to ensure robust standard errors. As previously noted, 'PCSE preserves the weighting of observations for autocorrelation, but uses a sandwich estimator to incorporate cross-sectional dependence when calculating standard errors' (Moundigbaye *et al.*, 2018:2). The residuals were found to be normally distributed – see Figure 6.2.

6.4.4 Endogeneity

Endogeneity occurs when an independent variable is correlated with the error term. This can be the result of omitted variables, or unobserved heterogeneity. In prior studies, similar models were used, and the variables did not cause endogeneity (AbuGhazaleh *et al.*, 2011). The present study reduced the risk of endogeneity by incorporating an additional independent variable.

From the descriptive statistics in Section 6.2, it was noted that there was a wide dispersion of firms in terms of firm size, as measured with the natural logarithm of the previous year's total assets, and goodwill impairment could be influenced by the size of a firm. To control for this, the size of each firm was included in the regression as a control variable. Potential heterogeneity was addressed by using an error-variance covariance matrix in the framework of seemingly unrelated regression and cross-section weights. Therefore, the assumption of heterogeneity was met.

6.5 MULTIVARIATE REGRESSION FINDINGS TO IDENTIFY THE DETERMINANTS OF GOODWILL IMPAIRMENT DECISIONS

Panel least squares regression was performed to test the second hypothesis. H_2 requires confirmation of statistically significant determinants of goodwill impairment decisions, in other words, of the reasons for which firms impair goodwill. Three regressions were performed and the results are presented below.

6.5.1 Initial panel least squares regression to identify the determinants of goodwill impairment decisions

The initial panel least squares regression results (without any adjustment to the model) showed that the residuals were not normally distributed. The initial regression results are shown in Table 6.4, overleaf.

Table 6.4: Initial panel least squares regression results to identify the determinants of goodwill impairment decisions

$GIL = \alpha_0 + \beta_1 CEOCHANGE + \beta_2 ROA + \beta_3 BACTIVITY + \beta_3 ADD + \beta_3 NI + \beta_3 BINDEP + \alpha_1 \ln SIZE_{t-1}$ (4.3)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	-1190454	-4.46**
CEOCHANGE	+	-16876.85	-0.23
ROA	-	-1549.37	-0.79
BACTIVITY	+	-2374.59	-0.19
ADD	+	-109766.50	-2.03
NI	+/-	0.01	4.79**
BINDEP	+	177412.60	1.08
$\ln SIZE_{t-1}$	+	81295.92	4.23**
R ²	0.22		
Adjusted R ²	0.20		
Durbin-Watson	1.46		
F-statistic	11.44**		

** denotes significance at <0.01 (two-tailed)

Key to variables:

CEOCHANGE	Indicator of whether there was a change in CEO for the year
ROA	Return on assets for the year
BACTIVITY	Number of board meetings during the year
ADD	Variable indicating whether a firm had acquisitions during the financial year
NI	Net income from continuing operations
BINDEP	Percentage of independent directors to the total number of directors
$\ln SIZE_{t-1}$	Natural logarithm of previous year's assets

Source: Author's analysis

Based on the preliminary investigations, the adjusted R² indicated that the model explained 20% of the variance in the dependent variable. The F-test of the regression model was statistically significant, indicating that all coefficient values differed from 0. Of the independent variables, only net income (0.01) and size (81295.92) were significant (at the 1% significance level) and the Durbin-Watson statistic (1.46) was within acceptable levels. The plots of the standardised residuals and the associated tests, with a skewness value of 4 and kurtosis of 26.89, indicated that the regression analysis method and model used should be reconsidered. Hence, the incorporation of fixed or random effects in the model was investigated. The Hausman (1978) test was performed to determine whether a fixed or random effects model should be incorporated into the model.

Table 6.5: Hausman test results to determine whether a fixed or random effects regression model should be used to identify the determinants of goodwill impairment decisions

Test summary	Chi-Sq Statistic	Chi-Sq. d.f.	Prob
Cross-section random	77.22	7	0.000**

** denotes significance at <0.01 (two-tailed)

Source: Author's analysis

Based on these results, the null hypothesis of a random effect model could be rejected, and therefore the fixed effects model was employed.

6.5.2 Panel least squares regression to identify the determinants of goodwill impairment decisions with first difference independent variables

All the variables have to be stationary, because if non-stationary variables are regressed, a regression will be spurious. As reported for the unit root testing in Section 6.4.2, two of the independent variables (net income and board independence) were non-stationary. To adjust for the non-stationarity of these two variables, this first differences transformation was used for all the independent variables. Applying the transformation made the data series stationary at first difference. The results of this regression are presented in Table 6.6.

Table 6.6: Panel least square regression results, with first difference transformation of all independent variables, to identify the determinants of goodwill impairment decisions

$GIL = \alpha_0 + \beta_1 CEOCHANGE + \beta_2 ROA + \beta_3 BACTIVITY + \beta_3 ADD + \beta_3 NI + \beta_3 BINDEP + \alpha_1 \ln SIZE_{t-1}$ (4.3)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	-721686.50	-1.99**
CEOCHANGE	+	124830.30	1.34
DROA	-	-1008.612	-0.33
DBACTIVITY	+	-90733.19	-6.28**
DADD	+	34351.94	0.67
DNI	+/-	0.01	0.85
DBINDEP	+	317107.70	1.13
$\ln SIZE_{t-1}$	+	45472.17	2.07*
R ²	0.22		
Adjusted R ²	0.19		
Durbin-Watson	1.64		
F-statistic	7.79**		

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

CEOCHANGE	Indicator of whether there was a change in CEO for the year
DROA	Return on assets for the year (at first difference)
DBACTIVITY	Number of board meetings during the year (at first difference)
DADD	Variable indicating whether a firm had acquisitions during the financial year (at first difference)
DNI	Net income from continuing operations (at first difference)
DBINDEP	Percentage of independent directors to the total number of directors (at first difference)
$\ln SIZE_{t-1}$	Natural logarithm of previous year's assets

Source: Author's analysis

The results presented above indicate that only board activity (90733.19, $p < 0.01$) and the control variable size (45472.17, $p < 0.05$) were significant predictors of the dependent variable. The coefficient for board activity produced a negative prediction and size a positive one. The adjusted R² suggests that 19% of the variance in goodwill impairment could be explained by the independent variables, and the F-test of the regression model was statistically significant. The plots of the standardized residuals, as well as the associated tests, with a skewness value of 2.65 and kurtosis of 31.15, indicated that the residuals were still not normally distributed.

The model presented in Table 6.6 used the first differences of all the variables. However, as indicated in Section 6.4.2, two variables were non-stationary (net income

and board independence). Therefore, in the next model, the first difference transformation was used only on these two variables, thereby making the non-stationary time series stationary (Gujarati & Porter, 2009).

To account for the presence of heteroscedasticity, as indicated by the high kurtosis value, panel EGLS was incorporated into the model, as discussed in Section 6.5.3.

6.5.3 Panel estimated generalised least squares regression to identify the determinants of goodwill impairment decisions

Using panel EGLS, specific estimation methods were specified to address the heterogeneity and autocorrelation assumptions. As documented in Section 5.5.2, the error-variance covariance matrix was modelled in the framework of seemingly unrelated regressions, using the period SUR approach. PCSE preserves the weighting of observations for autocorrelation, but uses an estimator to incorporate cross-sectional dependence in the calculation of standard errors (Moundigbaye *et al.*, 2018). Table 6.7 presents the results of the regression with period SUR as a weighting estimate, and PCSE as an error variance covariance.

Table 6.7: Panel EGLS regression results, with first difference transformation of non-stationary variables, to identify the determinants of goodwill impairment decisions

$GIL = \alpha_0 + \beta_1 CEOCHANGE + \beta_2 ROA + \beta_3 BACTIVITY + \beta_3 ADD + \beta_3 NI + \beta_3 BINDEP + \alpha_1 \ln SIZE_{t-1}$ (4.3)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	-637469.80	-9.75**
CEOCHANGE	+	-8939.37	-0.40
ROA	-	-1231.37	-4.91**
BACTIVITY	+	-3847.74	-2.43*
ADD	+	-50314.09	-5.79**
DNI	+/-	-0.01	-0.26
DBINDEP	+	-109542.10	-3.96**
$\ln SIZE_{t-1}$	+	46844.28	9.64**
R ²	0.28		
Adjusted R ²	0.26		
Durbin-Watson	1.64		
F-statistic	11.35**		

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

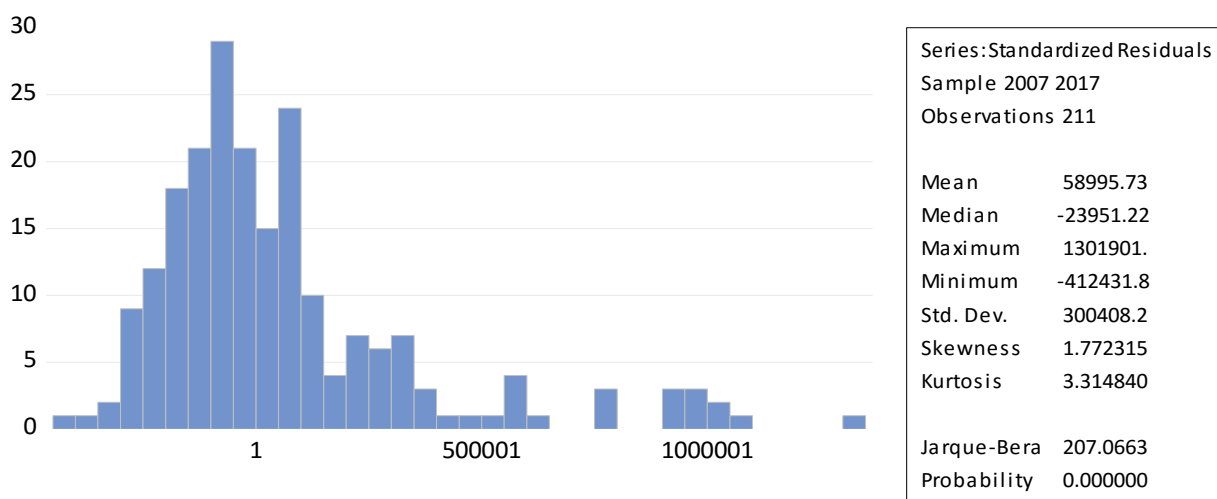
CEOCHANGE	Indicator of whether there was a change in the CEO for the year
ROA	Return on assets for the year
BACTIVITY	Number of board meetings during the year
ADD	Variable indicating whether a firm had acquisitions during the financial year
DNI	Net income from continuing operations (at first difference)
DBINDEP	Percentage of independent directors to the total number of directors (at first difference)
$\ln SIZE_{t-1}$	Natural logarithm of previous year's assets

Source: Author's analysis

With the panel EGLS model presented above, the adjusted R² improves from 20% to 26%. Interestingly, all the independent variables were significant predictors of the dependent variable, except for the change in CEO and DNI (the first difference of net income). Based on these results, all the significant coefficients were negative, with the exception of control variable size. Therefore, goodwill impairment in a firm can be predicted by a decrease in ROA (1231.37), a decrease in board activity (3847.74), a decrease in the goodwill balance (50314.09) and a decrease in board independence (109542.1). Goodwill impairment was positively correlated to the size of a firm. This provides support for H_2 , that there are specific predictors of goodwill impairment by a firm.

The adjusted R^2 suggests that the independent variables could explain 26% of the variance in market value. The regression was run again without the insignificant variables, namely a change in CEO and net income to determine whether the current model is the optimal regression model. Untabulated results showed a decrease in the adjusted R^2 from 26% to 19%. Therefore, the final model as presented in Table 6.7 can be accepted as the optimal model. The F-test of the regression model was statistically significant, indicating that all the coefficient values differed from 0. The residuals were normally distributed, as shown in Figure 6.2.

Figure 6.2: Standardised residuals using the Jarque-Bera test to determine normal distribution



Source: Author's analysis

As explained in Section 5.5.2, the skewness and kurtosis values were used to determine whether the standardised residuals were normally distributed. The standardised residuals as measured with skewness (1.77) and kurtosis (3.31) were within acceptable limits (between -7 and 7) and were normally distributed.

According to H_2 , there are underlying reasons embedded in a firm which can be used to predict goodwill impairment. Possible predictors, as defined in the literature, were investigated and the following inferences were made: a positive prediction was expected between a change in CEO and goodwill impairment, suggesting that a CEO is more likely to impair goodwill in his/her first year of appointment (Kabir & Rahman, 2016). Similarly, positive correlations with CEO tenure were documented by AbuGhazaleh *et al.* (2011) and Masters-Stout *et al.* (2008). It was thus surprising that a negative coefficient was found in the present study, which could imply that longer

CEO tenure was significantly associated with the likelihood of impairing goodwill for this sample and period. However, this negative coefficient between CEO tenure and goodwill impairment was not significant. Therefore, in the present study, no conclusive evidence was found that goodwill impairment can be predicted by whether there was a change in the CEO. This could also imply that South African CEOs do not use the accounting standards opportunistically to manipulate earnings by means of goodwill impairment – avoidance of manipulation of earnings may be related to the efficiency of corporate governance in South African firms.

Corporate governance is associated with an improvement in accounting quality (Lopes, Walker, & da Silva, 2016). Two measures of corporate governance were included in the model of the present study, namely the frequency of board meetings and the independence of the board. For both these variables, there was a significant negative correlation, in contrast to the positive sign prediction. These two corporate governance variables predict that in firms with fewer board meetings, and fewer independent directors on the board of directors, goodwill impairment is likely to increase. Gros and Koch (2015) documented similar findings, suggesting that stronger corporate governance mechanisms are associated with lower goodwill impairment losses. Similarly, AbuGhazaleh *et al.* (2011) and Verriest and Gaeremynck (2009) found that board independence and the regularity of meetings was negatively associated with the likelihood of recording a goodwill impairment loss.

The results of the present study are also consistent with those of Gu and Lev (2011), who hypothesized and confirmed that weak governance is associated with overpayment of target firms, which in turn leads to overstated goodwill. Overpayments then lead to subsequent goodwill write-off. However if goodwill is accurately valued, fewer impairments should occur. The results of the present study indicate that strong corporate governance measures may result in realistic goodwill balances and therefore subsequent impairment is not likely to occur very frequently. The current study's results are consistent with the findings of Chao and Horng (2013) and Gros and Koch (2015) that goodwill write-offs are more pronounced in weakly governed firms, suggesting that a strong governance setting is likely to constrain management's discretionary behaviour.

These results highlight the importance of strong corporate governance arrangements to ensure rigorous implementation of IFRS in general, particularly goodwill. Some firms may incorporate opportunistic behaviour to reach certain earnings targets, underlining the importance of corporate governance mechanisms. Profitability variables were therefore included in the present study to determine whether firms recognised goodwill impairment if there was a decrease in earnings, also referred to as 'income smoothing' (Chao & Horng, 2013). Results from the present study indicated that income smoothing did occur during the study period.

The role of performance and prior profitability, which is represented by the ROA, was highly significant ($p < 0.01$) and negatively correlated with goodwill impairment. This is consistent with the findings of prior studies (Binti Omar *et al.*, 2015; Gonçalves *et al.*, 2019; Kabir & Rahman, 2016) and suggests that goodwill impairment is related to a decrease in profitability. The findings support the claim that lower performance relates to a higher likelihood of goodwill impairment recognition and a higher amount of goodwill impairment recorded. According to Gonçalves *et al.* (2019), this suggests the presence of 'big bath' practices, in that an impairment loss is recorded to shift future losses to an already poor year. In this regard, Jordan *et al.* (2007) investigated potential earnings management during the first year after the adoption of IFRS 3, finding compelling evidence that managers exploited the adoption year to report large impairment losses. The present study's sample period was after the adoption of IFRS 3. The evidence suggests that managers were likely to take discretionary hits to income in a period already experiencing depressed earnings. Therefore, the results suggest that South African firms do use income smoothing practices, and recognise goodwill impairments when there is already a decrease in earnings. While no compelling evidence was found that new CEOs applied opportunistic accounting more frequently, earnings management at the hand of goodwill impairment did seem to be present. As was documented earlier, however, although clearly stronger corporate governance improves the reliability of goodwill balances, it is important to distinguish between firms that are active in merger and acquisition activities and those that are not. The control variable ADD, measuring how active a firm was in merger and acquisition activities, indicates a negative prediction of goodwill impairment. Therefore, an increase in goodwill is associated with a decrease in goodwill impairment.

The findings confirmed that the sample South African firms were conservative in accounting for goodwill. This finding contradicts that of AbuGhazaleh *et al.* (2011), who found that write-off firms had more additions to their goodwill. Bugeja and Loyeung (2015) argue that the allocation of the purchase price to goodwill is opportunistic and does not appear to reflect synergy potential. This argument suggests that if goodwill is overstated, it is likely to result in future impairment. Findings from the present study indicated that goodwill impairment was not associated with increased goodwill. This could imply that South African firms do not over-allocate the purchase price of an acquisition to goodwill. Since it seems that South African firms are conservative in accounting for goodwill, subsequent impairment could arise because of opportunistic behaviour by management, as indicated by the negative coefficient of prior profitability.

It is important to analyse effect of changes in goodwill and earnings management on goodwill impairment simultaneously, as both relate to the measurement of goodwill. The results suggest that the initial recognition of goodwill in this sample was conservative, but that the subsequent recognition implies earnings management. This phenomenon confirms that agency costs are potentially embedded in the recognition of goodwill impairment, and raises the question of whether investors regard goodwill impairment as value relevant or not. (The value relevance of goodwill impairment and its disclosure are discussed further in Chapter 7, where the fourth hypothesis is addressed.)

In the present study, the size of the firm was included as a control variable. Unlike AbuGhazaleh *et al.* (2011), the present study found that the size of the firm was significantly correlated with goodwill impairment, from which it can be concluded that larger firms are more likely to impair goodwill. These findings are consistent with those of Kent and Stewart (2008), who posit that larger firms have an increased awareness of the compliance requirements by IFRS.

6.5.4 Robustness of the regression

In order to assess the robustness of the final regression as presented in Section 6.5.3, a model variation test was conducted by including an instrumental variable, namely board size. To control for unobserved sources of variability, the instrumental variable

technique is the mirror opposite of the propensity score method for controlling observed variables (Winship & Morgan, 1999). Unlike with an observed control variable, an instrumental variable is assumed not to have any direct effect on the dependent variable. In other words, the effect of the instrumental variable on the dependent measure is entirely mediated via its effect on the independent variable(s).

In the present study, board size was likely to have an effect on most of the independent variables, for example, on board independence. Board independence is a measure of the percentage of independent directors in relation to the total number of directors (board size). Because of the significance level at which board independence predicting goodwill impairment was found in previous studies (AbuGhazaleh *et al.*, 2011; Verriest & Gaeremynck, 2009), the present study also included board independence as an independent variable. However, in reviewing the literature, it was noted that board size was not deemed a predictor of goodwill *impairment*, therefore it was not likely to have a direct effect on goodwill impairment in the present study. Board size could thus be considered an instrumental variable because it was correlated with all the explanatory variables at a statistically significant level ($p < 0.05$), except with a change in CEO, but was not correlated with the dependent variable, goodwill impairment.

The results indicated sustainability for three of the four statistically significant variables (frequency of board meetings, additions to goodwill and board independence), except for ROA with board size as the instrumental variable. By contrast, Chalmers *et al.* (2011) found that ROA was a significant predictor of goodwill impairment in Australian firms. The current research study pertains to South African firms that impaired their goodwill over the period from 2006 to 2017. Future research on the role of ROA as a statistically significant predictor of goodwill impairment will be necessary to confirm its robustness in a South African context.

6.6 SUMMARY AND CONCLUSION

This chapter contains the detailed findings regarding the testing of the second hypothesis, which posits that there are identifiable determinants of goodwill impairment decisions. The second objective of this study was identifying the reasons for firms' decision to impair goodwill. The findings from the multivariate regression revealed that the prior profitability, good corporate governance and merger and

acquisition activities were significant predictors of goodwill impairment. Firms that were more active in merger and acquisition activities were less likely to impair their goodwill, and so were firms that had strong corporate governance mechanisms in place. Earnings management did, however, seem to be present for the sample firm years, suggesting that earnings manipulation could be present. The findings thus support H_2 , indicating that goodwill impairment can be predicted based on certain elements within a firm. The findings reported in this chapter were robust to the model specifications.

In Chapter 7, the results of the testing for the third and fourth hypotheses are discussed. H_3 relates to the factors that determine the quality of disclosure of goodwill impairment and H_4 to the effects of goodwill impairment and its disclosure on firm value.

CHAPTER 7: RESEARCH FINDINGS ON THE DETERMINING FACTORS OF THE QUALITY OF DISCLOSURE OF GOODWILL IMPAIRMENT AND FIRM VALUE

7.1 INTRODUCTION

The third hypothesis of this study states: *Certain determinants affect the quality of goodwill impairment disclosure more than others*. Thus H_3 posits that the quality of goodwill impairment disclosure is more affected by some determinants of that quality than by others. In addition, the fourth hypothesis (*Goodwill impairment and its disclosure are value relevant*) argues that goodwill impairment and the test-related disclosure are value relevant. Hence, this chapter reports in detail on the findings on the effects of goodwill impairment and its disclosure on firm value (if any). The discussion is divided into the descriptive statistics, the findings on the correlation analysis, assumption testing, panel regression analysis and robustness testing for H_3 and H_4 . The chapter concludes with a summary of the findings.

The same sample used to test H_2 was also used to test H_3 and H_4 , since only firms with recorded goodwill impairments are relevant to the investigation and testing of these hypotheses. Therefore, the same exclusions documented in Section 6.4.1 for H_2 applied here. For H_4 , some additional exclusions were made, as discussed in Section 7.3.3.1.

7.2 FINDINGS ON THE IDENTIFICATION OF FACTORS THAT DETERMINE THE QUALITY OF DISCLOSURE OF GOODWILL IMPAIRMENT

This section discusses the results of the testing of H_3 , which posits that there are specific factors that determine the quality of goodwill impairment disclosure.

7.2.1 Descriptive statistics for the continuous variables used to identify the factors determining the quality of disclosure of goodwill impairment

The sample used to test for this particular hypothesis included the firms from the original sample that recognised goodwill impairment for one or more years during the sample period. A total of 300 goodwill impairments arose during the sample period of 12 years (2006 to 2017). A content analysis was performed for the 300 company and year combinations with goodwill impairments, based on the annual financial reports.

Where there are missing values, this indicates that the information could not be obtained from the annual financial reports. For most of the variables used to test the third hypothesis, there were 300 observations. Only two variables, namely the expertise of the audit committee (*AUDEXP*) and the independence of the audit committee (*AUDIND*) had fewer observations, at 296 and 298 respectively, because the information relating to the audit committee expertise and audit committee independence were not disclosed in the annual financial reports concerned. The descriptive statistics for *ROA%* and *Size* were included in the model to test H_3 , as already presented and discussed in the descriptive statistics for the findings regarding H_2 in Section 6.2. The descriptive statistics for the sample firm-years for the remainder of the variables are set out in Table 7.1.

Table 7.1: Descriptive statistics for the continuous variables to identify the factors determining the quality of disclosure of goodwill impairment

	N	Mean	Median	Standard deviation	Minimum	Maximum	Skewness	Kurtosis
<i>DISC</i>	300	0.69	0.8	0.26	0	1	-1.09	0.39
<i>LEV</i>	300	0.58	0.59	0.19	0.06	1.13	-0.06	0.22
<i>INTAN ZAR</i> million	300	9	9	10806	0	66772	3.41	11.81
<i>BINDEP</i>	300	0.51	0.50	0.19	0	0.93	-0.01	-0.46
<i>AUDIND</i>	298	0.90	1	0.21	0	1	-2.13	4.03

Key to variables:

DISC Goodwill impairment disclosure index (% expressed as a value between 0 and 1)

LEV Leverage, measured by total liabilities divided by total assets

INTAN Intangible assets, excluding goodwill

BINDEP Percentage of independent directors to the total number of directors (% expressed as a value between 0 and 1)

AUDINDEP Independence of the audit committee (% expressed as a value between 0 and 1)

Source: Author's analysis

The disclosure index (*DISC*) was calculated for each firm-year observation, based on the requirements in *IAS 36* (see Appendix A), and is expressed as a fraction. According to Table 7.1, the highest score was 1, suggesting a full score of 100%, and the minimum score was 0. This seems reasonable because some firms had a high level of quality disclosure, but other firms did not make any of the required disclosures. The mean value of 0.69 suggests that firms scored on average 69% on compliance. This is lower than the mean value of 81.9% found in a study by André *et al.* (2018), who investigated a sample of European firms (their study included only two sample years, whereas the present study included 12 years' data).

LEV is an indicator of the firm's leverage, and a similar mean (0.58) and median value (0.59) were found. The mean value of 0.58 suggests that 58% of the firms' assets were financed with liabilities. The mean and median value were equal, at ZAR 9 million for intangible assets, excluding goodwill. The minimum value of 0 suggests that the intangible assets of some firms in the data sample consisted only of goodwill. The mean value of 0.9 and median of 1 for audit independence (*AUDINDEP*) suggests that most of the audit committee members were independent. Additional analysis (not tabulated here) indicated that, on average, an audit committee consisted of four members, and on average, 90% of the committee were independent.

High levels of skewness and kurtosis were observed for all the variables in the regression. However, linear panel regression modelling only required the residuals to be normally distributed, not the variables in the equation.

A number of binary (categorical) variables were used in the testing of the third hypothesis. For these variables, a 0 or a 1 was assigned. The frequencies of these variables were investigated, and are presented in Table 7.2.

Table 7.2: Frequency of binary variables used in identifying the factors determining the quality of disclosure of goodwill impairment

Binary variable	UGIL	MAT	BIG4	AUD expertise	Categorical variables						
					SECTOR						
					IND	BM	CS	CG	HC	TECH	TELE
0	77%	12.3%	15%	0.3%	59%	84%	78%	96%	97%	90%	97%
1	23%	87.7%	85%	99.7%	41%	16%	22%	4%	3%	10%	3%

Key to variables:

UGIL Understated goodwill impairment

MAT Materiality, measured as goodwill in relation to total assets

BIG4 Variable indicated as 1 if the firm was audited by a Big4 auditing firm, 0 if otherwise

AUD expertise Variable indicated as 1 if there is a member on the audit committee with financial expertise, 0 if otherwise.

IND Industrials

BM Basic materials

CS Consumer services

CG Consumer goods

HC Health care

TECH Technology

TELE Telecommunications

Source: Author's analysis

UGIL, indicating whether goodwill impairment was undervalued, indicated that 77% of the sample firms did not undervalue their goodwill impairment. The remainder of the sample firm-years (23%) did undervalue their goodwill impairment. Based on the frequencies listed above, it seems that, for the majority of the sample firms, goodwill was not understated.

The materiality of goodwill in relation to total assets is presented by *MAT*. If goodwill represented 50% of total assets, a score of 1 was assigned, and a score of 0 was assigned if the goodwill value was less than 50% of total assets. For the sample used to test this hypothesis, only 12.3% of the firm-years did not have a material goodwill balance, whereas 87.7% did. Therefore, it appears that goodwill was material for most of the observations included in the sample.

As Table 7.2 indicates, 85% of firms included in the sample were audited by one of the Big4 auditing firms. Most of the audit committees (99.7% of the sample) had at least one member with financial expertise.

The sample represented seven different industries, namely Industrials, Basic Materials, Technology, Consumer Goods, Consumer Services, Telecommunications and Health Care. A dummy variable with a value of 1 represented a particular industry,

and a value of 0 (otherwise) was constructed for every industry. The frequencies presented in Table 7.2 suggest that Industrials was the sector represented most strongly in the sample, followed by Consumer Services, Basic Materials and Technologies. In this sample, Consumer Goods, Health Care and Telecommunications had a small representation, as only 3% to 4% of the sample were classified as belonging to these sectors.

7.2.2 Pearson correlation analysis of the variables identifying the factors determining the quality of disclosure of goodwill impairment

A Pearson correlation analysis was performed for the sample period for every pair of variables involved in the testing of H_3 . The variables used in this testing are presented in Table 7.3 (overleaf). Correlation between a dummy variable and a continuous variable is called a point biserial correlation, and it is calculated in a similar way to the Pearson correlation. For two binary variables, the Pearson correlation calculation value returned is equal to Phi, the measure of association between two binary variables.

The correlations documented in Table 7.3 indicate that the independent variables were weakly correlated with the dependent variables. Of the independent variables, materiality, size, Big4 auditing firm, board independence and expertise of the audit committee were all statistically significantly correlated with the disclosure index score at the 1% level of significance (using two-tailed significance). The variables intangible assets and independence of the audit committee were statistically significantly correlated with the disclosure index score at the 5% level (using two-tailed significance). The variables that displayed the highest correlations with the disclosure index were materiality of goodwill (0.272) followed by independence of the audit committee (0.238), Big4 auditing firm (0.178), size (0.159) and expertise of the audit committee (0.154). All of these variables displayed a positive correlation with the dependent variable, the disclosure index. These correlations indicated that if the materiality of goodwill, independence of the audit committee, Big4 auditing firm, size and expertise of the audit committee increased, the disclosure index also increased. However, undervalued goodwill impairment, ROA% and leverage were not statistically significantly correlated with the dependent variable. The risk of multicollinearity between independent variables is addressed in Section 7.2.3.5.

Table 7.3: Pearson correlation analysis of variables used to identify the factors determining the quality of disclosure of goodwill impairment

	<i>DISC</i>	<i>UGIMP</i>	<i>MAT</i>	<i>ROA %</i>	<i>lnSIZE_{t-1}</i>	<i>LEV</i>	<i>INTAN</i>	<i>BIG4</i>	<i>BINDEP</i>	<i>AUDEXP</i>	<i>AUDIND</i>
<i>DISC</i>	1										
<i>UGIMP</i>	0.033	1									
<i>MAT</i>	0.272**	-0.132*	1								
<i>ROA %</i>	-0.057	-0.336**	0.204**	1							
<i>lnSIZE_{t-1}</i>	0.159**	-0.054	0.122*	-0.038	1						
<i>LEV</i>	-0.050	-0.136*	0.333**	-0.015	-0.134*	1					
<i>INTAN</i>	0.145*	0.018	0.154**	-0.010	0.605**	-0.065	1				
<i>BIG4</i>	0.178**	0.057	0.065	-0.069	0.277**	-0.104	0.103	1			
<i>BINDEP</i>	0.238**	-0.047	0.095	-0.126*	0.534**	-0.184**	0.343**	0.246**	1		
<i>AUDEXP</i>	0.154**	-0.109	-0.022	0.012	-0.008	-0.088	0.020	0.138*	0.157**	1	
<i>AUDIND</i>	0.131*	-0.035	-0.080	-0.165**	0.268**	-0.247**	0.067	0.254**	0.510**	0.255**	1

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

<i>DISC</i>	Goodwill impairment disclosure index
<i>UGIMP</i>	Understated goodwill impairment
<i>MAT</i>	Materiality, measured as goodwill in relation to total assets
<i>ROA %</i>	Return on assets for the year
<i>lnSIZE_{t-1}</i>	Natural logarithm of previous year's assets
<i>LEV</i>	Leverage, measured by total liabilities divided by total assets
<i>INTAN</i>	Intangible assets, excluding goodwill
<i>BIG4</i>	Variable indicated as 1 if the firm was audited by a Big4 auditing firm, 0 if otherwise
<i>BINDEP</i>	Percentage of independent directors to the total number of directors
<i>AUDEXP</i>	Variable indicated as 1 if an audit committee member has financial expertise, 0 if otherwise
<i>AUDIND</i>	Independence of the audit committee

Source: Author's analysis

7.2.3 Testing of assumptions in the data sample to identify the factors determining the quality of disclosure of goodwill impairment

In this section, the results of the assumption testing are detailed. Certain assumptions have to be met in order to ensure that the regression models are valid. The assumption tests are grouped into subsections according to the fundamentals which they address.

7.2.3.1 Extreme outliers

For the testing of H_2 , H_3 and H_4 , the same sample was used, hence the same exclusions discussed in Section 6.4.1 were also relevant here.

7.2.3.2 Stationarity of variables

Unit root tests were performed to test for the stationarity of the variables. As with H_1 and H_2 , contradictory results were identified using the different tests. This problem with unit root testing is typical for series with a short time span. The outcomes of stationarity tests may be biased with reference to cross-sectional dependence and a short time dimension ($t \leq 12$).

The Phillips-Peron (PP) test, which is regarded as robust against heteroscedasticity in the error term, is based on the individual unit root and is appropriate for a small sample (Zivot, 2006), and was used to test for H_2 . Based on the PP test, only $ROA\%$ and $DISC$ were stationary, except regarding audit independence ($AUDIND$), board independence ($BINEP$), intangible assets ($INTAN$) and leverage (LEV). To account for this, first differences were considered for these variables. The results of the PP–Fisher Chi-square unit root test are presented in Table 7.4, overleaf.

Table 7.4: Fisher Chi-square unit root testing of independent variables to identify the factors determining the quality of disclosure of goodwill impairment

	PP – Fisher Chi-square
Independent variables	
<i>DISC</i>	58.62**
<i>AUDIND</i>	17.80
<i>DAUDIND#</i>	23.97**
<i>BINDEP</i>	28.76
<i>DBINEP#</i>	101.06**
<i>INTAN</i>	20.36
<i>DINTAN#</i>	77.46**
<i>LEV</i>	25.81
<i>DLEV#</i>	74.87**
<i>ROA%</i>	54.59*

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

denotes the first difference variable

Key to variables:

<i>DISC</i>	Goodwill impairment disclosure index
<i>AUDIND</i>	Independence of the audit committee
<i>BINDEP</i>	Percentage of independent directors to the total number of directors
<i>INTAN</i>	Intangible assets, excluding goodwill
<i>LEV</i>	Leverage, measured by total liabilities divided by total assets
<i>ROA%</i>	Return on assets for the year

Source: Author's analysis

The variables presented in Table 7.4 were therefore stationary.

7.2.3.3 Heteroscedasticity

The possible presence of heteroscedasticity was addressed by using the robust White diagonal estimates, which are heteroscedasticity-corrected standard errors (Gujarati & Porter, 2009). Heteroscedasticity was not present, as the residuals were found to be normally distributed – see Figure 7.1.

7.2.3.4 Endogeneity

Endogeneity occurs when an independent variable is correlated with the error term. This can be the result of omitted variables, or unobserved heterogeneity. The present study reduced the risk of endogeneity by incorporating an additional independent variable.

From the descriptive statistics in Section 6.2, it was noted that there was a wide dispersion in terms of firm size. Disclosure quality could therefore be influenced by the size of a firm.

To control for this, firm size was included in the regression as a control variable. The different industries that firms operate in were also controlled for. Heterogeneity was addressed in Section 7.2.3.3.

7.2.3.5 Multicollinearity

In order to ensure that no multicollinear variables were used in the regression analysis, VIFs were observed, and were found to range between 1.18 and 3.17. The VIF values were all below the benchmark value of 10 (Burns & Burns, 2008), which implies that for this analysis, multicollinearity was not a concern.

7.2.4 Multivariate regression findings to identify the factors determining the quality of disclosure of goodwill impairment

Panel least squares regression was performed to identify the determinants of quality of disclosure, testing H_3 .

Regressions on panel data must take into account that the data are a combination of cross-section data and time series, where the same unit cross-section is measured at different times. H_3 was aimed at determining the extent of the relationship between the predictors and high-quality goodwill impairment disclosure. Two regressions were performed and the results are presented below. To control for potential industry effect, the various industries were included as dummy variables, with the Basic Materials industry used as the reference industry.

7.2.4.1 Initial panel least squares regression to identify the factors determining the quality of disclosure of goodwill impairment

The initial panel least squares regression results (without any adjustment to the model) are shown in Table 7.5, overleaf. The predicted sign column indicates the direction of the relationship expected on the basis of the previous literature on which the hypothesis formulation was premised.

Table 7.5: Initial panel least squares regression results to identify the factors determining the quality of disclosure of goodwill impairment using a goodwill impairment disclosure index

$DISC = \alpha_0 + \beta_1UGIL + \beta_2MAT + \beta_3ROA + \beta_4LEV + \beta_5INTAN + \beta_6BIG4 + \beta_7BINDEP + \beta_8AUDEXP + \beta_9AUDIND + \alpha_1lnSIZE_{t-1} + \alpha_2INDUSTRY$ (4.5)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	0.24	-0.68
UGIL	+	0.01	0.26
MAT	+	0.24	4.47**
ROA	+	0.01	-1.98
LEV	+	0.14	-1.41
INTAN	+	6.71	0.36
BIG4	+	0.05	1.09
BINDEP	+	1.08	1.73
AUDIND	+	0.63	-0.20
AUDEXP	+	3.13	2.36
$lnSIZE_{t-1}$	+	0.01	0.14
IND_CG	+	0.19	2.01*
IND_CS	+	0.03	0.65
IND_HC	+	0.04	-0.38
IND_IND	+	0.03	0.59
IND_TECH	+	0.09	1.26
IND_TELE	+	0.11	1.17
R ²	0.18		
Adjusted R ²	0.14		
Durbin-Watson	0.57		
F-statistic	3.93**		

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

UGIL	Understated goodwill impairment
MAT	Materiality, measured as goodwill in relation to total assets
ROA	Return on assets for the year
LEV	Leverage, measured by total liabilities divided by total assets
INTAN	Intangible assets, excluding goodwill
BIG4	Variable indicated as 1 if the firm was audited by a Big4 auditing firm, 0 if otherwise
BINDEP	Percentage of independent directors to the total number of directors
AUDIND	Independence of the audit committee
AUDEXP	Variable indicated as 1 if an audit committee member has financial expertise, 0 if otherwise
$lnSIZE_{t-1}$	Natural logarithm of previous year's assets
IND_CG	Industry: Consumer Goods
IND_CS	Industry: Consumer Services
IND_HC	Industry: Health Care
IND_IND	Industry: Industrials
IND_TECH	Industry: Technologies
IND_TELE	Industry: Telecommunications

Source: Author's analysis

Based on the preliminary investigation, the adjusted R² indicated that the model explained only 14% of the variance in the dependent variable. The F-test of the regression model was statistically significant, indicating that all the coefficient values were statistically significantly

different from 0. Of the independent variables, only materiality of goodwill and ROA were significant predictors of goodwill impairment. The plots of the standardized residuals and the associated tests, with a skewness of -0.66 and kurtosis of 0.14, were within acceptable levels. The Durbin-Watson statistic (0.57) was below the acceptable levels and called for reconsideration of the regression analysis method and model used to address the presence of serial correlation. Subsequently, the incorporation of fixed or random effects in the model was investigated.

The Hausman (1978) test was performed to determine whether a fixed or random effects model should be incorporated into the model (see Table 7.6).

Table 7.6: Hausman test results to determine whether a fixed or random model should be used in identifying the factors determining the quality of disclosure of goodwill impairment

Test summary	Chi-Sq Statistic	Chi-Sq. d.f.	Prob
Cross-section random	52.95	10	0.000**

** denotes significance at <0.01 (two-tailed)

Source: Author's analysis

The statistic did not support the null hypothesis that the random effects model is preferable, and it indicated that a fixed effects model should be considered. However, when the fixed effect model was incorporated, it resulted in an error, namely a singular matrix. This normally occurs when independent variables are multicollinear, even though, according to the results reported in Section 7.2.2, multicollinearity was not a concern. The error can be explained by the fact that there was collinearity between the firm and its industry, because the fixed effects model includes dummy variables per cross-section (firm). The random model was thus reconsidered on the basis of the results of the cross-section random effects test comparisons for each individual independent variable. Given the coefficient estimates from both the random and fixed effects estimators, along with the variance of the difference and associated *p*-values for the hypothesis that there is no statistically significant difference, only board independence (*BINDEP*) was found to differ between both models. In addition, (untabulated) results revealed the cross-section random effect contribution explained 56% of the total variance, thereby supporting the consideration of the random effects model.

It must be noted that the Hausman (1978) test is not an absolute indicator of a fixed or random effect, but only a guideline. Johnston and DiNardo (1997) warn that a simple rule

does not always suffice and, so over-rejection of the null hypothesis has been observed in certain cases if the Hausman (1978) test is performed based on its asymptotical critical values, when Swamy and Arora and Amemiya methods are used for estimating the random effects model (Sheytanova, 2015).

7.2.4.2 Estimated generalised least squares method of estimation with first difference independent variables to identify the factors determining the quality of disclosure of goodwill impairment

As was found in the unit root testing discussed in Section 7.4.2, three of the independent variables (board independence, intangible assets and leverage) were non-stationary. All the variables have to be stationary, because if non-stationary variables are regressed, regression results can be spurious. To adjust for this, first differences transformations were used for these non-stationary independent variables. Applying the first differences, the data series were found to be stationary. The results of this regression are presented in Table 7.7, overleaf.

Table 7.7: Panel EGLS regression results, with first difference transformation on non-stationary independent variables, in identifying the factors determining of the quality of disclosure of goodwill impairment using a goodwill impairment disclosure index

$DISC = \alpha_0 + \beta_1UGIL + \beta_2MAT + \beta_3ROA + \beta_4DLEV + \beta_5DINTAN + \beta_6BIG4 + \beta_7DBINDEP + \beta_8AUDIND + \beta_9AUDEXP + \alpha_1lnSIZE_{t-1} + \alpha_2INDUSTRY$ (4.5)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	-0.63	-1.69
UGIL	+	0.06	1.65
MAT	+	0.24	3.46**
ROA	+	-0.01	-1.82
DLEV	+	-0.05	-0.36
DINTAN	+	-8.86	-0.35
BIG4	+	0.04	0.51
DBINDEP	+	0.11	1.03
AUDIND	+	0.21	2.45*
AUDEXP	+	0.66	3.22**
lnSIZE _{t-1}	+	0.02	1.02
IND_CG	+	0.21	1.25
IND_CS	+	-0.05	-0.52
IND_HC	+	-0.01	-0.08
IND_IND	+	-0.06	-0.69
IND_TECH	+	0.01	0.05
IND_TELE	+	0.04	0.25
R ²	0.24		
Adjusted R ²	0.18		
Durbin-Watson	1.22		
F-statistic	3.89**		

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

UGIL	Understated goodwill impairment
MAT	Materiality, measured as goodwill in relation to total assets
ROA	Return on assets for the year
DLEV	Leverage, measured by total liabilities divided by total assets
DINTAN	Intangible assets, excluding goodwill
BIG4	Variable indicated as 1 if the firm was audited by a Big4 auditing firm, 0 otherwise
DBINDEP	Percentage of independent directors to the total number of directors
AUDIND	Independence of the audit committee
AUDEXP	Variable indicated as 1 if an audit committee member has financial expertise, 0 if otherwise
lnSIZE _{t-1}	Natural logarithm of previous year's assets
IND_CG	Industry: consumer goods
IND_CS	Industry: consumer services
IND_HC	Industry: health care
IND_IND	Industry: Industrials
IND_TECH	Industry: Technologies
IND_TELE	Industry: Telecommunications

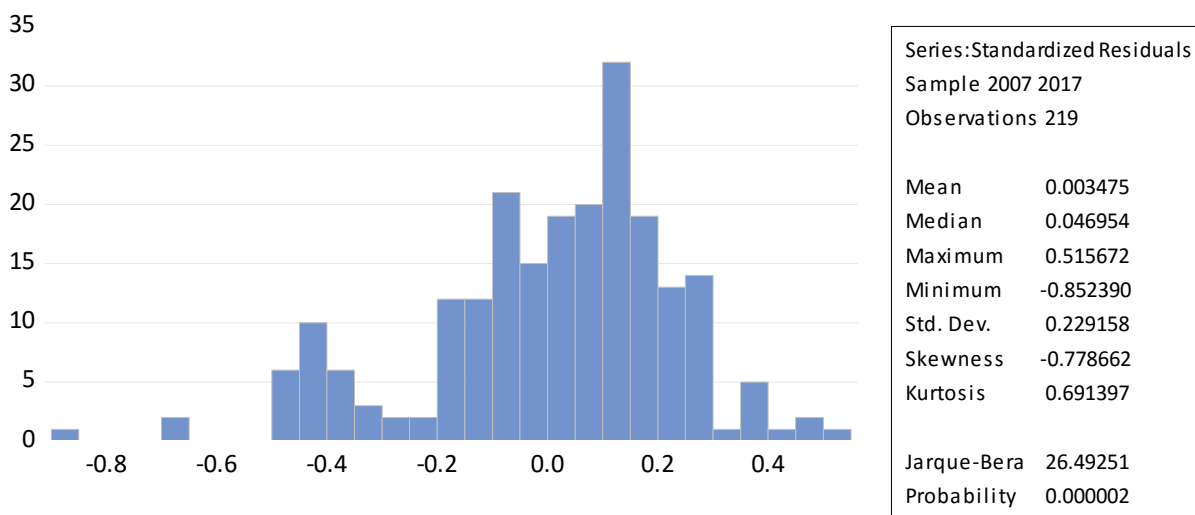
Source: Author's analysis

With the estimated generalised least square model presented above, the adjusted R^2 improved from 14% to 18%, which is still a low value. However, the aim of the analysis was to determine which of the predictors were statistically significant predictors (direction and strength of relationship) of the independent variables, and not to build a predictive model for *DISC*, so the results are still relevant.

Of the independent variables, materiality of goodwill, independence and expertise of the audit committee were statistically significant predictors of the dependent variable, the disclosure index score. Materiality and independence of the audit committee displayed positive coefficients and expertise of the audit committee displayed a negative coefficient. Therefore, an increase in the quality of goodwill impairment disclosure was related to an increase in materiality of goodwill (0.24, $p < 0.01$), audit committee independence (0.21, $p < 0.05$) and the presence of financial expertise in the audit committee (0.66, $p < 0.01$) (compared to no financial expertise in the audit committee).

These findings supported H_3 , that there are certain predictors of the quality of goodwill impairment disclosure. The F-test of the regression model was statistically significant, indicating that all the coefficient values differed from 0. The residuals were approximately normally distributed, as is shown in Figure 7.1.

Figure 7.1: Standardised residuals using the Jarque-Bera test to determine normal distribution



Source: Author's analysis

The standardised residuals were within acceptable terms, with a skewness of -0.77 and kurtosis of 0.69. According to H_3 , there are certain variables that have an effect on the level of the quality of goodwill impairment disclosure. Possible predictors described in the literature were investigated. Based on the findings, it was possible to infer that a firm's goodwill intensity, measured as the ratio of goodwill to total assets (MAT), was positively associated with the quality of goodwill impairment disclosure (0.24, $p < 0.01$). This finding is in line with the argument that firms that have higher goodwill balances (and thus are possibly more involved in merger and acquisition activities) are more accustomed to the disclosure requirements, providing higher quality disclosure. These findings are consistent with the earlier findings of Bepari *et al.* (2014), who suggest that firms with high levels of goodwill intensity have a higher level of high-quality disclosure than firms with low levels of goodwill intensity. Size was thus included as a control variable to ensure that the known effect of size on goodwill intensity was taken into account.

The findings also reveal that good corporate governance mechanisms, as measured by the independence and financial expertise of the audit committee, seem to result in a higher level of quality disclosure. These results are consistent with those of Beekes and Brown (2006), which indicate that better-governed firms make more informative disclosures. This finding should be read in the context of the findings based on H_2 , as documented in Section 6.5.3, which confirmed that strong corporate governance mechanisms result in lower goodwill impairment. Taken together, these findings imply that firms with strong corporate governance are less likely to overpay for target firms and therefore report more conservative goodwill balances. In light of the documented findings based on H_2 and H_3 , it is clear that good corporate governance mechanisms not only result in more realistic goodwill balances, but also improve the quality of goodwill disclosure.

Consistent with the expectation set out in H_3 , understated goodwill impairment was found to have a positive coefficient, but the correlation was not significant. In a related study, Kabir *et al.* (2017) found that firms that understated their goodwill impairment had higher goodwill impairment test-related disclosure. It is worth noting that, according to the results set out in Table 7.7, in the present study, understated goodwill impairment came in just above the level of significance, with a p-value of 0.101, slightly above the 10% level of significance. The difference between the results in the present study and those of Kabir *et al.* (2017) is potentially attributable to the different data sample (Australian firms versus South African

firms) and differences in the economic setting and industries of these countries. Secondly, Kabir *et al.* (2017) used a multiple regression approach where the years were presented by a dummy variable, whereas in the present study a panel data approach was followed.

Bepari *et al.* (2014) have provided evidence that firms' industry categorization is significantly associated with their compliance with the goodwill impairment disclosure requirements. However, in the present study, industry was not a statistically significant predictor of the quality of goodwill impairment disclosure. The final regression including the industry variables resulted in adjusted R^2 of 17.54%. When a hierarchical regression analysis was then performed by repeating the final regression, but without the industry variables, this further analysis resulted in an adjusted R^2 of 18.38%, almost one percentage point higher. This implies that the inclusion of the industry variables did not improve the regression model. It can therefore be concluded that the quality of goodwill impairment disclosure was not influenced by the different industries in which firms operate. However, in future research, goodwill-intensive industries can be identified on which further testing can be performed to confirm these results.

In summary, according to the final regression, presented in Table 7.7, the materiality of goodwill and the independence and expertise of the audit committee were statistically significant predictors of high-quality disclosure of goodwill impairment. Firms that had material goodwill balances tended to have a higher quality of disclosure than firms with less material goodwill balances. None of the industries were significant predictors of goodwill impairment. The fact that the materiality of goodwill was a statistically significant predictor, but that none of the industries were, suggests that there was no industry that was more goodwill-intensive than others. By contrast, the studies performed by Amiraslani *et al.* (2013) of firms in European countries and Bepari *et al.* (2014) of Australian firms, found that goodwill-intensive industries had relatively high levels of compliance with the accounting regime, and thus firms in those industries provided a higher quality of disclosure. The positive statistical prediction of an association between corporate governance and goodwill impairment suggested that firms with sound corporate governance mechanisms in place were associated with more realistic goodwill balances. This would result in the presentation of more relevant and timelier financial information to shareholders. The question of whether goodwill impairment is itself value relevant is explored further in Section 7.3.

The results presented in Table 7.7 support H_3 which states that there are determining factors that could be used to predict the quality of goodwill impairment disclosure.

7.2.5 Robustness of the regression

As in the model variation test performed in Section 6.5.3, board size was included as an instrumental variable. For the purposes of testing H_3 , board size was deemed likely to have an effect on most of the independent variables. However, the literature did not consider board size a predictor of the quality of goodwill impairment disclosure itself, and therefore it was not likely to have a *direct* effect on the quality of disclosure in the present study. Board size could thus be considered an instrumental variable, as it correlated with all the explanatory variables except with the materiality of goodwill and leverage at a statistically significant level ($p < 0.05$), but did not correlate with the dependent variable (quality of goodwill impairment disclosure).

The results indicated sustainability for all the statistically significant variables. Based on these results the final regression model presented in Table 7.7 can be accepted as robust to the model specifications.

7.3 FINDINGS REGARDING THE VALUE RELEVANCE OF GOODWILL IMPAIRMENT AND ITS DISCLOSURE

In this section, the results of the testing for the fourth hypothesis are discussed. H_4 relates to the value relevance of goodwill impairment and its disclosure.

7.3.1 Descriptive statistics of the variables used to determine the value relevance of goodwill impairment and its disclosure

Descriptive statistics were performed for a final sample of 300 firm-year observations, as indicated in Table 7.8, overleaf. For the regression analysis, all the variables were scaled by number of shares outstanding.

Table 7.8: Descriptive statistics for all variables used to determine the value relevance of goodwill impairment and its disclosure

	N	Mean	Median	Standard deviation	Minimum	Maximum	Skewness	Kurtosis
<i>MVEPS</i> ZAR	300	121	42	331	0.1	3948	8.1	77
<i>BVEPS</i> ZAR	300	44.84	20.84	67.97	-26.46	477.47	3.62	16.49
<i>NIPSexGILPS</i> ZAR	300	5.69	2.92	13.11	-57.18	87.24	1.23	13.56
<i>GILPS</i> ZAR	300	0.45	0.09	0.99	0	8.18	4.24	22.35
<i>DISC %</i>	300	0.69	0.8	0.26	0	1	-1.09	0.39
<i>INT_DISC*</i> <i>GILPS</i> ZAR	300	0.19	0	0.84	-0.65	9.11	5.78	50

Key to variables:

MVEPS Market value per share

BVEPS Book value per share

NIPSexGILPS Net income from continuing operations excluding goodwill per share

GILPS Goodwill impairment per share

DISC Goodwill impairment disclosure index (% represented by value between 0 and 1)

*INT_DISC** Interaction variable disclosure index and goodwill impairment per share

GILPS

Source: Author's analysis

The market value per share had a mean value of ZAR 121 and a much lower median value of ZAR 42. Similar to H_1 , H_2 and H_3 , this confirmed that the data were skewed to the right. The minimum value of ZAR 0.1 and the maximum value of ZAR 3948 suggest that there was a large dispersion of firms in terms of size, and that there might be outliers (potential outliers are investigated in Section 7.3.3.1).

Similarly, the market value of equity and the book value of equity indicated the potential risk of outliers, with a mean value of ZAR 44.84 and a median value of ZAR 20.84 respectively. The minimum value of book value of equity at -ZAR 26.46 indicated that for some firms total liabilities exceeded total assets, which gave rise to a negative book value (as addressed in Section 7.3.3.1 under potential outliers).

Net income per share, excluding goodwill impairment per share, had a mean value of ZAR 5.69 and a median of ZAR 2.92. The minimum value of -ZAR 57.18 appeared reasonable,

as it represented the net loss during a particular period. However, the more extreme values were also investigated further as part of the assumption testing in Section 7.3.3.1.

Goodwill impairment per share with a mean value of ZAR 0.45 and a median value of ZAR 0.09 confirmed the dispersion of firms in terms of size. The minimum value of goodwill impairment per share of ZAR 0 arose because of rounding.

The disclosure index had a mean value of 0.69 and a median value 0.8. The minimum value of 0 indicated that some firms scored 0 for their level of quality disclosure. The maximum value of 1 indicated that some firms obtained a perfect score. This seems reasonable, as some firms had a high level of quality disclosure, whereas other firms did not make any of the required disclosures, and therefore a 0 score was allocated.

High levels of skewness and kurtosis were observed for all the variables in the regression. However, linear panel regression modelling only requires the residuals to be normally distributed, not the variables in the equation. Nevertheless, outliers were investigated and removed to ensure that the model represented the majority of observations and did not influence the regression model fitted.

In the next section, the degree of a linear relationship between each pair of variables is investigated.

7.3.2 Pearson correlation analysis to determine the value relevance of goodwill impairment and its disclosure

In Table 7.9, overleaf, the correlations for the variables to determine the value relevance of goodwill impairment and its disclosure are presented.

Table 7.9: Pearson correlation analysis of variables to determine the value relevance of goodwill impairment and its disclosure

	<i>MVEPS</i>	<i>BVEPS</i>	<i>NIPSexGILPS</i>	<i>GILPS</i>	<i>DISC</i>	<i>INT_DISC*GILPS</i>
<i>MVEPS</i>	1					
<i>BVEPS</i>	0.635**	1				
<i>NIPSexGILPS</i>	0.516**	0.515**	1			
<i>GILPS</i>	0.226**	0.301**	0.145*	1		
<i>DISC</i>	0.098	0.123*	0.008	0.194**	1	
<i>INT_DISC*GILPS</i>	0.101	0.115*	0.750**	0.022	-0.192**	1

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

MVEPS Market value per share

BVEPS Book value per share

NIPSexGILPS Net income per share excluding goodwill impairment per share

GILPS Goodwill impairment per share

DISC Goodwill impairment disclosure index (% represented by value between 0 and 1)

*INT_DISC*GILPS* Interaction between goodwill impairment and disclosure score

Source: Author's analysis

As documented in Table 7.9, strong positive correlations ($p > 0.01$) were observed between the market value per share, book value per share, net income per share (excluding goodwill impairment per share) and goodwill impairment per share. A moderate positive correlation ($p > 0.05$) was observed between goodwill impairment per share and book value per share. All other pairs of correlations were weakly positively correlated, except for a weak negative relationship between the interaction term of goodwill impairment disclosure and disclosure with the disclosure index. Multicollinearity is discussed in Section 7.3.3.4.

7.3.3 Testing of assumptions in the data sample

7.3.3.1 Extreme outliers

The same data sample was used to test H_2 , H_3 , H_4 and H_5 , hence the same exclusions (discussed in Section 6.4.1) applied to the testing of H_3 and H_4 . However, upon further investigation, additional exclusions were made in testing for H_4 . As explained in Section 5.4.1, the financial data for company Lonmin contained extreme values because of events that occurred in 2012. For this reason, the observations for this company contained extreme outliers and all the observations from this company were excluded from the sample used to test for H_4 . Furthermore, closer inspection showed that the book value for Sun International in 2017 was an extreme outlier with a negative book value per share of -ZAR 26. The

company's annual financial statements for this particular sample year were scrutinized, and it was found that the negative equity value for that year was the result of the value of treasury shares in that year. The value of treasury shares and share options was so high that total equity was in debit. This extreme outlier was therefore also excluded from the sample.

7.3.3.2 Stationarity of data

For the variables market value and book value per share, the natural logarithm (ln) transformation was used to address non-stationarity. The natural logarithm (ln) transformation on the non-stationary variables (book value and market value per share) detrended the data and resulted in a series that was stationary. The results are presented in Table 7.10.

Table 7.10: Fisher Chi-square unit root testing of independent variables to determine the value relevance of goodwill impairment and its disclosure

	PP – Fisher Chi-square
Independent variables	
<i>BVEPS</i>	26.63
<i>lnBVEPS</i>	61.31**
<i>NIPSexGILPS</i>	42.16**
<i>GILPS</i>	54.32**
<i>INT_DISC*GILPS</i>	52.36**

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

<i>BVEPS</i>	Book value per share
<i>lnBVEPS</i>	Natural logarithm of book value per share
<i>NIPSexGILPS</i>	Net income per share excluding goodwill impairment per share
<i>GILPS</i>	Goodwill impairment per share
<i>INT_DISC*GILPS</i>	Interaction between goodwill impairment and disclosure score

Source: Author's analysis

Based on the results presented in Table 7.10, the independent variables were all stationary.

7.3.3.3 Heteroscedasticity

The Breusch-Pagan test for heteroscedasticity could not be performed, because some of the standardised residuals were zero. For this reason, the possible presence of heteroscedasticity was controlled for by applying the Panel Corrected standard error estimation in the final regression. The application of robust standard errors did not change

the statistically significant variables in the final regression; thus no heteroscedasticity was present.

7.3.3.4 Endogeneity

To address potential endogeneity, the use of an instrumental variable was considered. However, an instrumental variable could not be identified to test H_4 because the dependent variable used in this model, namely market value per share, was influenced by a number of external factors and variables. Unobserved heteroscedasticity was addressed as already documented in Section 7.3.3.3, and none was found.

7.3.3.5 Multicollinearity

In order to ensure that there was no multicollinearity in the regression analysis, VIFs were observed. They ranged between 1.44 and 3.46. All the VIF values were below the benchmark value of 10 (Burns & Burns, 2008), which implies that for this analysis multicollinearity was not a concern.

7.3.4 Multivariate regression findings to determine value relevance of goodwill impairment and its disclosure

This analysis was aimed at determining the value relevance of goodwill impairment and its disclosure. A panel least squares regression analysis was performed to test H_4 . Two panel least squared regressions were performed, the first regression with no modifications, and the second incorporating fixed effects. The results are presented below.

7.3.4.1 Initial panel least squares regression to determine the value relevance of goodwill impairment and its disclosure

A panel least squares regression was performed to test H_4 and the results are presented in Table 7.11, overleaf. To transform the data into stationary variables, logarithms were used, namely the natural logarithm (ln) of market value and book value. The predicted sign column indicates the direction of the relationship expected (based on the literature and reflected in the hypothesis formulation).

Table 7.11: Initial ordinary least squares regression results to determine the value relevance of goodwill impairment and its disclosure

$\ln MVEPS = \alpha_0 + \beta_1 \ln BVEPS + \beta_2 NIPSexGILPS + \beta_3 DISC + \beta_4 GILPS + \beta_5 INT_DISC * GILPS$ (4.6)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	5.14	26.54**
<i>lnBVEPS</i>	+	0.99	24.18**
<i>NIPSexGILPS</i>	+	0.01	2.57*
<i>DISC</i>	+	0.21	0.92
<i>GILPS</i>	+	-0.33	-3.39**
<i>INT_DISC * GILPS</i>	+	0.41	3.74**
R ²	0.73		
Adjusted R ²	0.73		
Durbin-Watson	0.27		
F-statistic	159.28**		

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

<i>lnBVEPS</i>	Natural logarithm of book value per share
<i>NIPSexGILPS</i>	Net income per share excluding goodwill impairment per share
<i>DISC</i>	Goodwill impairment disclosure index (% represented by value between 0 and 1)
<i>GILPS</i>	Goodwill impairment per share
<i>INT_DISC * GILPS</i>	Interaction between goodwill impairment and disclosure score

Source: Author's analysis

Based on preliminary investigation, the adjusted R² indicated that the model explained 73% of the variance in the dependent variable and the F-test of the regression model was statistically significant, indicating that all the coefficient values differed from 0. Of the independent variables, only book value per share (0.99) and net income excluding goodwill impairment (0.01) were significant (at the 1% significance level).

The Durbin-Watson statistic (0.27) was not within acceptable levels and the plots of the standardised residuals, with a skewness value of 3.62 and kurtosis of 37.23, indicated the need to reconsider the regression analysis method and the model used. Consequently, the incorporation of fixed or random effects into the model was investigated. The Hausman (1978) test was performed to determine whether a fixed or random effects model should be incorporated into the model, and the results are presented in Table 7.12, overleaf.

Table 7.12: Hausman’s test results to determine whether a fixed or random effects model should be incorporated to determine the value relevance of goodwill impairment and its disclosure

Test summary	Chi-Sq Statistic	Chi-Sq. d.f.	Prob
Cross-section random	74.08	5	0.000**

** denotes significance at <0.01 (two-tailed)

Source: Author’s analysis

Based on these results, the null hypothesis of a random effect model could be rejected, and therefore the fixed effects model was employed.

7.3.4.2 Panel least squares regression with fixed effects to determine the value relevance of goodwill impairment and its disclosure

Table 7.13 presents the results of the panel least squares regression with fixed effects.

Table 7.13: Panel least squares regression with fixed effects to determine the value relevance of goodwill impairment and its disclosure

$\ln MVEPS = \alpha_0 + \beta_1 \ln BVEPS + \beta_2 NIPSexGILPS + \beta_3 DISC + \beta_4 GILPS + \beta_5 INT_DISC * GILPS$ (4.6)			
Variable	Predicted sign	Coefficient	t-Statistic
C	+/-	6.53	33.93**
$\ln BVEPS$	+	0.66	10.65**
$NIPSexGILPS$	+	0.01	3.55**
$DISC$	+	-0.45	-2.48**
$GILPS$	+	-0.08	-1.18
$INT_DISC * GILPS$	+	0.17	2.21*
R ²	0.94		
Adjusted R ²	0.92		
Durbin-Watson	1.49		
F-statistic	44.21**		

** and * denote significance at <0.01 and <0.05 (two-tailed), respectively

Key to variables:

- $\ln BVEPS$ Natural logarithm of book value per share
- $NIPSexGILPS$ Net income per share excluding goodwill impairment per share
- $DISC$ Goodwill impairment disclosure index (% represented by value between 0 and 1)
- $GILPS$ Goodwill impairment per share
- $INT_DISC * GILPS$ Interaction between goodwill impairment and disclosure score

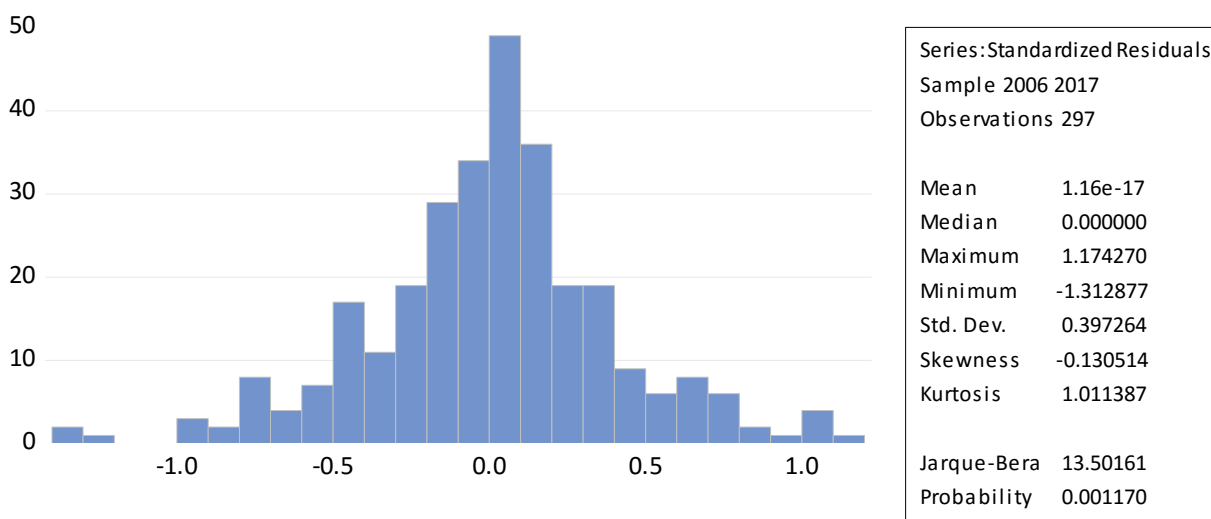
Source: Author’s analysis

The results presented above indicate that book value per share (0.65, $p < 0.01$), net income per share excluding goodwill impairment (0.01, $p < 0.01$) and the interaction between goodwill impairment and disclosure quality (0.17, $p < 0.05$) are statistically significant predictors of the

dependent variable with positive coefficients. The coefficient for the disclosure score was negative and statistically significant (-0.45, $p < 0.01$). The adjusted R^2 suggests that 92% of the variance in market value per share was explained by the independent variables, taking into account the dummy variables created in the fixed effect model. The F-test of the regression model was statistically significant.

The standardised residuals were approximately normally distributed, as is shown in Figure 7.2.

Figure 7.2: Standardised residuals using the Jarque-Bera test to determine normal distribution



Source: Author's analysis

As explained in Section 5.5.2 the skewness and kurtosis values were used to determine whether the standardised residuals were normally distributed. The standardised residuals were within acceptable limits, with a skewness of -0.13 and kurtosis of 1.01. According to H_4 , the market value of a firm is positively related to goodwill impairment and its disclosure.

As expected, using the Ohlson (1995) model, book value per share and net income per share were statistically significant predictors of the market value of the firm. This finding is consistent with the findings of Kabir *et al.* (2017) and Xu *et al.* (2011). The results listed in Table 7.13 suggest that there was a positive linear relationship between the ln of the book value and the ln of the market value of a firm. Therefore, a one unit increase in book value per share of the firm should lead to an increase of 0.66 units in the market value per share. Because an ln transformation was applied to the dependent variables, a one unit increase

in net income excluding goodwill impairment, as well as a compliance, resulted in an exponential increase of $e^{0.01}$ and $e^{0.17}$ in the market value of a firm. Therefore, a one unit increase in net income per share (excluding goodwill per share) would lead to an increase in the market value per share of 1. Similarly, a one unit increase in the interaction term between goodwill impairment and disclosure compliance would result in an increase of 19% in the market value per share. Furthermore, a one unit increase in the disclosure compliance score would result in an exponential decrease of $e^{-0.45}$ in the market value (a decrease of 36.2% per share).

A similar model was applied in the study by Kabir *et al.* (2017), but they could not provide evidence that the interaction term or disclosure compliance were statistically significant predictors of market value. Kabir *et al.* (2017) did find goodwill impairment to be a significant predictor of a firm's market value, whereas in the present study goodwill impairment did not appear to be a significant predictor. The differences between the findings of the present study and that by Kabir *et al.* (2017) may be ascribed to the different sample periods and the firms sampled; the present study investigated South African firms over a 12-year period (2006 to 2017), whereas Kabir *et al.* (2017) used Australian firms over a 6-year period (2007 to 2012). In another study contradicting Kabir *et al.*'s (2017) findings, Xu *et al.* (2011) found that goodwill impairment had a negative effect on the market value of a sample of US firms between 2003 and 2006.

Based on the results presented in Table 7.13, it seems that South African investors do not regard goodwill impairment as value relevant, similar to findings presented by Hamberg and Beisland (2014) in their study on European firms. In an interview-based study performed by KPMG (2014), interviewees noted that any value relevance associated with goodwill impairment lies in its confirmatory rather than its predictive value.

In the present study, the value relevance of goodwill impairment was measured in terms of the share value of the firm three months after the year end, because Li and Sloan (2015) found that goodwill impairments generally lag behind true economic impairment. This could imply that the market anticipates impairments before they are recognised in the financial statements. Therefore, it may be argued that the fact that the present study could not provide evidence that goodwill impairment was value relevant may indicate that deteriorating operating performance lags goodwill impairments.

The present study did, however, find that the disclosure of goodwill impairment was significant, but with a negative coefficient, opposite to the positive relationship hypothesized. H_4 implies that all the independent variables should have a positive relationship with market value, but evidence was only found for some of the independent variables. Therefore H_4 was not supported. Goodwill impairment was not found to be significant to firm value, although the interaction between goodwill impairment and its disclosure compliance was significant. These results suggest that even if the market price is negatively associated with the coefficient of goodwill impairment disclosure compliance, the coefficient of goodwill impairment disclosure compliance does depend on the goodwill impairment of a firm.

The findings imply that investors do not deem goodwill impairment value relevant, but that they do take it into account in assessing the disclosure of goodwill impairment. While a positive relationship was expected between market value and the disclosure of goodwill impairment, it seems that investors regard the disclosure of goodwill impairments in a negative light. However, the negative sign regarding disclosure does not necessarily indicate that investors view the *quality* of disclosure of goodwill impairment in a negative manner, but potentially regard the goodwill *impairment* underlying the disclosure as negative.

The disclosure of goodwill, its impairment, impairment-related tests and the assumptions used in the calculations, represent management's use of its discretion in determining the goodwill impairment. The negative correlation could confirm agency theory, suggesting that investors are not comfortable with the management discretion embedded in goodwill impairment. Alternatively, it could suggest that the disclosure index does not add any value: it is merely a 'box-ticking exercise' of complying with *IAS 36* (Amiraslani *et al.*, 2013).

The interaction term and its positive statistical relationship with market value indicates a strong connection between goodwill impairment disclosure compliance index and goodwill impairment. This result indicates that if the interaction between the two variables is considered, the disclosure index and goodwill impairment do have a statistically significant positive effect on market value. This confirms the notion that investors could potentially view the disclosure of goodwill impairment in a negative manner, however, when the value of goodwill impairment is included in their assessment, the overall effect on the market value may be positive.

Results presented in Section 6.5.3 show that earnings management, with specific reference to goodwill impairment, was found in the present study. Such earnings management could be evident from a firm's disclosure of goodwill impairment, or the lack of such disclosure, as confirmed by the negative coefficient found in this regression to test H_4 , for the disclosure index. The results reported in Chapter 6, which looked at the identification of reasons for goodwill impairment, suggest that the firms in this sample tended to account for goodwill in a conservative manner, but that subsequent impairment of goodwill could be a result of opportunistic behaviour. Results from the regression model to test for H_4 indicated that goodwill impairment did not have a statistically significant relationship with market value. Therefore, management discretion and potential earning management in respect of goodwill impairment could be why investors do not regard goodwill impairment as value relevant. Hamberg and Beisland (2014) argue that market participants are not sure of whether managerial discretion can be relied upon. Hence, the results of the regression model conducted to test for H_4 suggesting that goodwill impairment was disregarded when market value was determined appears reasonable.

However, once goodwill impairment and its disclosure are considered simultaneously, the relationship is statistically significant. This implies that goodwill impairment is not fully disregarded by investors, but could be value relevant if it is accompanied by impairment test-related disclosure. Individually, neither goodwill impairment nor its disclosure is a positive predictor of market value. However, assessed together, they could potentially be value relevant for investors. This confirms the importance of firms' disclosure of goodwill impairments, as it could assist users of the financial statement to understand goodwill and its impairment better. Firms should improve their disclosure by providing more depth and content on goodwill impairment. Every year, or as soon as there is an indication of goodwill impairment, the impairment tests need to be performed. These tests, together with the assumptions used, need to be disclosed in the financial statements. Management is also required to give a description of goodwill impairment and what led to the impairment. This description, or reason, for goodwill impairment is explored further in Chapter 8.

7.3.5 Robustness of the regression

To determine whether the final regression (as presented in Section 7.3.4.2) was robust, random permutation tests were performed. For the purposes of this study, ten random samples were created in SPSS with approximately 50% of the total sample. This resulted in

sample sizes of approximately 150 data points, which is a fairly small sample. For each of the ten random samples, the final regression was repeated. Inconsistent results were found regarding the statistically significant predictors of the dependent variable. Results were also inconsistent using other robustness testing approaches, such as structural permutation. The structural permutation entailed the final regression, repeated seven times with the exclusion of a different industry per regression. As this study was not able to prove the robustness of these particular statistical results, future research on the role of goodwill impairment as a statistically significant predictor of market value will be necessary to confirm the robustness of such conclusions in the South African context.

7.4 SUMMARY AND CONCLUSION

This chapter contained the detailed findings on the third and fourth hypotheses, and considered the determinants of the quality of the disclosure of goodwill impairments, and the value relevance of goodwill impairment and its disclosure. The findings from the multivariate regression for testing H_3 show that materiality of goodwill, the expertise and independence of the audit committee are all statistically significant predictors of the quality of goodwill impairment disclosure, and therefore H_3 is supported. H_4 was not supported. In the testing of H_4 , the book value and net income were found to be statistically significant predictors of market value, in line with some prior studies (Kabir *et al.*, 2017; Ohlson, 1995; Xu *et al.*, 2011). However, goodwill impairment was not a statistically significant predictor of market value, and the disclosure of goodwill impairment displayed a negative relationship with the market value of the firm. Nevertheless, the interaction term between goodwill impairment and its disclosure was found to be a statistically significant predictor of market value, indicating that market participants do value these variables when they are considered together. This confirms the claim made by KPMG (2014) that market reaction is signalled by the disclosure of the assumptions used in the impairment testing, and not by the asset itself.

Chapter 8 reports on a cluster analysis considering the quality of goodwill impairment disclosure and the reasons provided by management for impairing goodwill. The cluster analysis results are discussed looking at potential differences between the ways reasons are provided by management, as well as the industry of operation.

CHAPTER 8:

CLUSTER ANALYSIS: QUALITY OF GOODWILL IMPAIRMENT DISCLOSURE

8.1 INTRODUCTION

The impairment of goodwill relates to a management decision, and this implies that there is some pressure on management to provide a reasonable explanation of the reasons for making the decision to impair goodwill. Sandell and Svensson (2017) point out that there is an element of authorship involved in financial communication, for example, in the way goodwill impairment is explained to stakeholders. The ways in which management provides reasons for impairing goodwill should, however, move the users of the financial statements' understanding beyond the question of whether goodwill impairment was explained to whether the explanation strategy and the reasons given enhance understanding of the textual disclosures in the report.

Research Objective 4 of the present study is analysing the explanations of the reasons provided by management and the disclosure quality of goodwill impairment between the different industries. For this purpose, H_5 was formulated as follows: *The quality of goodwill impairment disclosure differs, based on the various reasons provided by management for impairing goodwill, and the quality of goodwill impairment disclosure differs amongst industries.* The testing of the hypothesis considers differences in the quality of disclosure between industries and the different ways in which reasons are reported for firms' impairment of goodwill. Building on the content analysis performed to test H_2 and H_3 , a cluster analysis was applied to identify the different categories of industries, firm size, reasons given for goodwill impairment and the disclosure quality of goodwill impairments.

Thus cluster analysis was employed to address H_5 by detecting similarities within and differences between groupings, and deriving typologies. These groupings can give insight into the explanation strategies used by management to provide reasons for goodwill impairment, in conjunction with a firm's level of quality disclosure, the size of a firm and industry of operations. The discussion in the rest of the chapter is divided into the data sample description, the two-step cluster analysis findings and a summary of the overall findings relating to H_5 .

8.2 DATA USED TO PERFORM THE CLUSTER ANALYSIS

The sample used to test H_5 is the same as that used for H_2 and H_3 (see Section 6.4.1). For the sample period 2006 to 2017, there were 300 goodwill impairment data points. For each of these, a disclosure index was calculated, and the data were used as input for the cluster analysis. As part of the content analysis, the reported reason for each goodwill impairment in the sample period was identified and the form of the explanation (the explanation strategy) was classified into one of seven different categories: excuse, justification, refocusing, concession, mystification, wordification and silence (see Table 8.1).

Table 8.1: Taxonomy of explanation strategies to provide reasons for goodwill impairments

Account	Definition
Excuse	Admits that the event or act is 'bad, wrong or inappropriate', but also denies responsibility (Scott & Lyman, 1968), e.g. appeals to external circumstances, accidents or the shortcomings of others (Sandell & Svensson, 2017).
Justification	Accepts responsibility for an event or act, but denies the negative qualities associated with it (Scott & Lyman, 1968), e.g. denial or minimizing the damage, appealing to positive intentions (Sandell & Svensson, 2017).
Refocusing	Redirects the reader's attention away from the event to a different issue or shifts focus (Sandell & Svensson, 2017).
Concession	Acknowledges guilt and takes responsibility for the event.
Mystification	Admits that expectations have not been met but offers no reasons (Sandell & Svensson, 2017). The language used makes it difficult for the reader to interpret.
Wordification	Gives a response that is merely a translation of numbers into words, a repetition of the accounting language (numbers) in natural language (words) (Sandell & Svensson, 2017).
Silence	Gives no account because there is nothing to be gained by giving an explicit account or comments are deemed unnecessary (Sandell & Svensson, 2017).

Source: Author's analysis

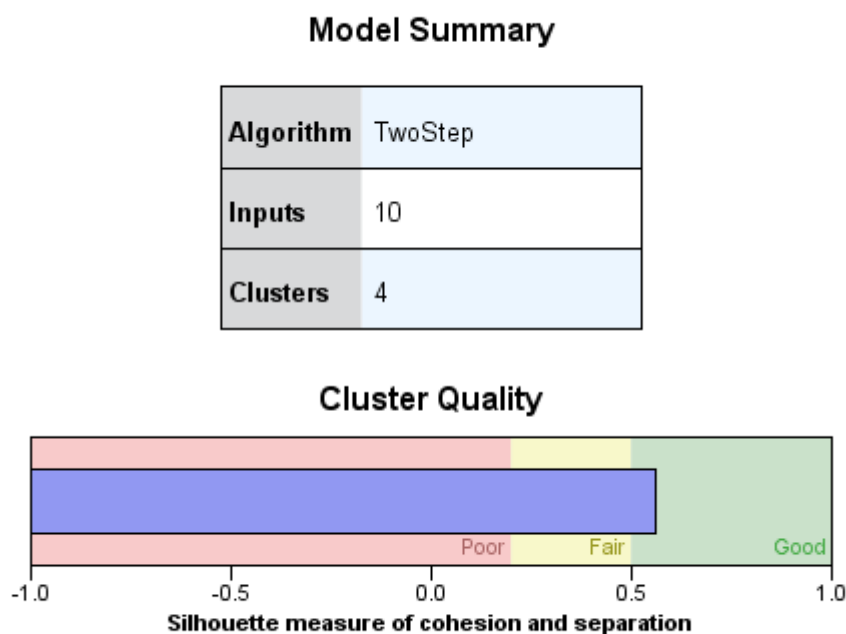
For each sample year, the explanation strategies management used to provide reasons for impairment were classified in one of the seven categories. These explanation strategies, together with the disclosure quality of goodwill impairment, the size of a firm and the industry, were used as inputs for the two-step cluster analysis.

8.3 GOODWILL IMPAIRMENT DISCLOSURE: TWO-STEP CLUSTER ANALYSIS

Two-step cluster analysis mechanically selects the number of clusters from a data sample. The disclosure index score of goodwill impairment, the size of a firm, the industry and the categories of explanation strategies for the reported reasons for goodwill impairment were used to identify potential clusters in the cluster analysis. In this case, a total of 300 firms

were used to investigate in an explorative manner whether there were clusters of organisations based on how the reasons were provided for goodwill impairment, the size of the organisation and the disclosure quality. The two-step cluster analysis was applied to the variables leading to the formation of four clusters. The cluster quality was indicated by the silhouette measure of cohesion and separation, with a value of 0.6, which is a value above 0.0 and thus suggests that the within-cluster distance and the between-cluster distance were valid (Norusis, 2012). The cluster solution is presented in Figure 8.1.

Figure 8.1: Two-step cluster solution



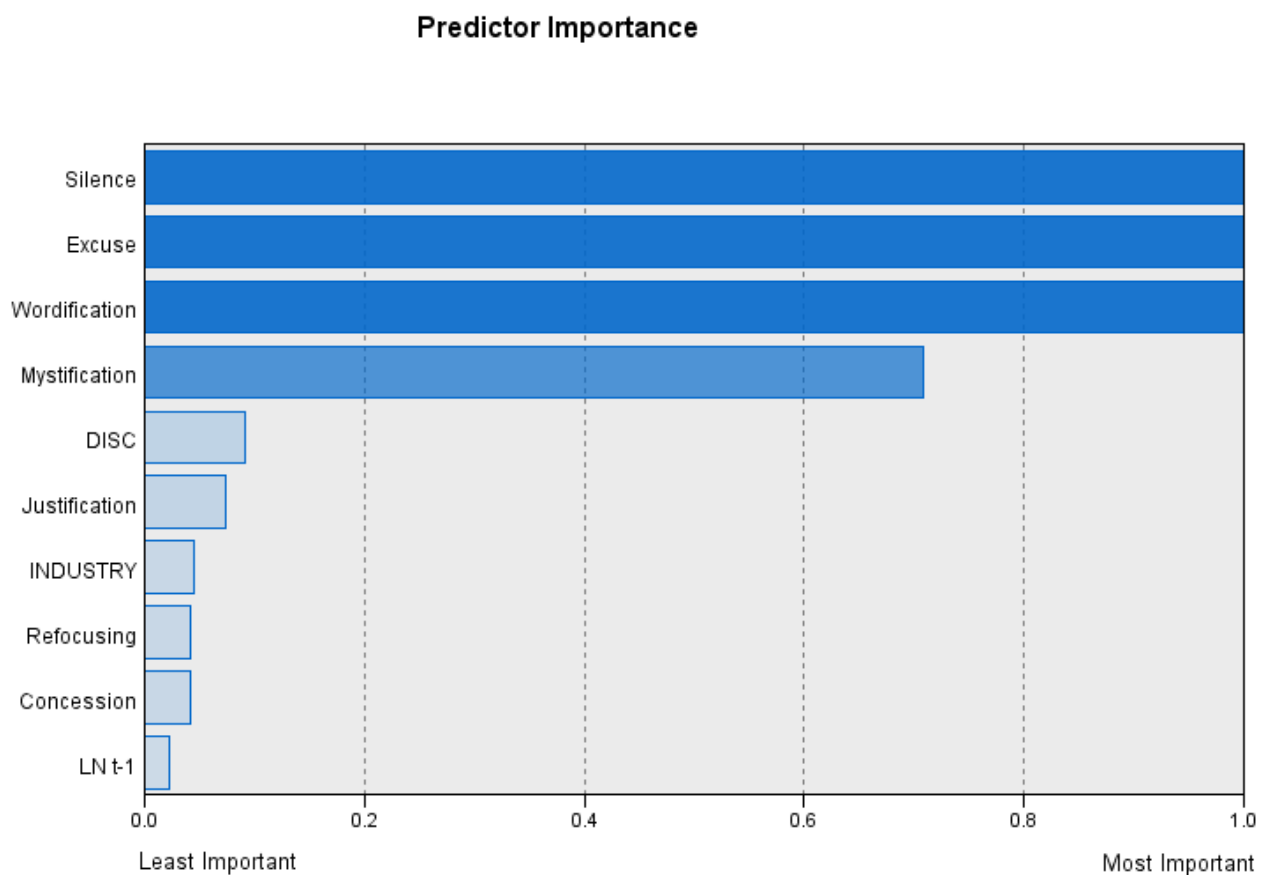
Source: Author's analysis

The ten inputs in the model were represented by the disclosure score of goodwill impairment, the size of a firm, the industry and seven different categories of how reasons were reported by management. These cluster results can be used to distinguish groups based on how they provided reasons for goodwill impairment, disclosure indices, size of firm and the industry they operate in.

8.4 GOODWILL IMPAIRMENT DISCLOSURE: TWO-STEP CLUSTER ANALYSIS RESULTS

The inputs were investigated to determine the predictor importance. The predictor importance indicates the relative importance of each predictor in estimating the clusters. Because the values were relative, the sum of all the values for all predictors equalled 1. The predictor importance chart is presented in Figure 8.2.

Figure 8.2: Cluster output: predictor importance



Source: Author's analysis

Four predictors, namely 'silence', 'excuse', 'wordification' and 'mystification', were identified as much stronger predictors in each of the clusters. 'Silence' had the most prominent influence on the cluster output, followed by 'excuse', and then in third and fourth place by 'wordification' and 'mystification', whereas 'refocusing', 'concession' and the size of a firm having the least importance. Upon further investigation, it was found that of the 300 observations, the reason provided for impairing goodwill was presented in a 'concession' and by 'refocusing' only three times respectively. These explanation strategies thus

appeared very seldom, and had no influence on the cluster. The predictors with the highest importance are likely to form the different clusters in the present study.

Once the inputs were entered into the model, the two-step cluster formed four different clusters (groups).

Based on the cluster output, four groups were formed. Group 1 was represented by 73 observations, Group 2 by 52, Group 3 by 79 and Group 4 by 96 data observations. For each of the sample firms, a value of 1 was assigned for the explanation strategy employed by management, and a 0 for the other reasons that were not applicable. For all the firms grouped into Group 1, management did not give any reasons for goodwill impairment and so the explanation strategy was classified as 'silence'. The majority (75%) of firms clustered in Group 2 used 'mystification' to obscure the reasons for their goodwill impairment. All the firms in Group 3 used an 'excuse' – they admitted the impairment, but also denied full responsibility (Scott & Lyman, 1968). Firms in Group 4 used 'wordification' to obscure the negative event.

The disclosure index is expressed as a percentage, 0 indicating non-compliance and 1 full compliance. For the four groups, the average disclosure index ranged from 0.60 to 0.81. Not surprisingly, the lowest disclosure index of 0.60 was the average for Group 1 (which used 'silence' as a strategy) and the highest disclosure index was found for Group 3 (which admitted the impairment, but with an 'excuse').

'Predominant industry' is an indicator of the industry which was most strongly represented per group. For all groups other than Group 3, industrials were the most prominent industry. In Group 3, the firms were mostly in the consumer services industry. However, as seen in Figure 8.2 the predictor importance of the variable 'industry' was low.

These results are illustrated in Table 8.2.

Table 8.2: Two-step cluster output of groups according to the explanation strategies management used to provide reasons and the quality of disclosure

Group	1	2	3	4
N	73	52	79	96
% of total	24.30%	17.30%	26.40%	32%
Inputs	Excuse	Excuse	Excuse	Excuse
Reason categories	0 (100%)	0 (100%)	1 (100%)	0 (100%)
	Silence	Silence	Silence	Silence
	1 (100%)	0 (100%)	0 (100%)	0 (100%)
	Wordification	Wordification	Wordification	Wordification
	0 (100%)	0 (100%)	0 (100%)	1 (100%)
	Mystification	Mystification	Mystification	Mystification
	0 (100%)	1 (75%)	0 (100%)	0 (100%)
	Justification	Justification	Justification	Justification
	0 (100%)	0 (90.4%)	0 (100%)	0 (100%)
	Concession	Concession	Concession	Concession
	0 (100%)	0 (94.2%)	0 (100%)	0 (100%)
	Refocusing	Refocusing	Refocusing	Refocusing
	0 (100%)	0 (94.2%)	0 (100%)	0 (100%)
DISC (mean)	0.60	0.63	0.81	0.71
Predominant Industry	Industrials (45.20%)	Industrials (50%)	Consumer services (29.10%)	Industrials (43.80%)
Size (mean)	15.86	16.35	16.67	16.23

Source: Author's analysis

Size represents the size of the firm, which was calculated by the natural logarithm of the previous year's assets. The size of a firm did not appear to play a significant role in determining the clusters, as can be seen in the predictor importance findings presented in Figure 8.2. For each of the four clusters, the value of size was very similar and ranged between 16.03 and 16.78. The values in Table 8.2 (above) are the average per group.

The frequency of the explanation strategies used by management to provide reasons for goodwill impairment was categorised in the four different groups as shown in Table 8.3.

Table 8.3: Explanation strategies to provide reasons for goodwill impairment per group

Reasons	N	Group 1	Group 2	Group 3	Group 4
Wordification	96				96
Excuse	79			79	
Silence	73	73			
Justification	5		5		
Mystification	39		39		
Concession	3		3		
Refocusing	3		3		
Missing data			2		
	300	73	50	79	96

Source: Author's analysis

In the next section, the four groups formed in the two-step cluster analysis are discussed in more detail.

8.4.1 Group 1: Silence

Group 1, the third largest group, consisted of 73 observations, representing 24.30% of the total sample. The firms included in this group did not provide any reasons for their goodwill impairment at all, and their explanation strategy was therefore categorised as 'silence'. According to Sandell and Svensson (2017), the explanation strategy should be classified as 'silence' when no comments are provided in natural language.

The group was mainly made up of firms in the industrials sector (45.20%), followed by consumer services (19.18%) and basic materials (16.44%). This group also had the lowest average disclosure index score of 0.60.

The firms were mostly the smallest firms, which is evident from the fact that this group had the lowest size variable, at 15.86, of the four groups. This indicates that the smaller firms in this sample tended to have a lower quality of goodwill impairment disclosure, and did not give any reason for their goodwill impairment. The findings from the testing of H_2 documented in Section 6.5.3 indicated that larger firms were more likely to recognise goodwill impairment. Smaller firms were less likely to impair goodwill, but when they did, the quality of their disclosure was lower than that of larger firms. A reason for this could be that smaller firms do not have the necessary expertise to comply with IFRS.

According to Amiraslani *et al.* (2013), there tend to be low levels of compliance in areas requiring managerial effort to satisfy reporting requirements, such as providing a reason for the impairment, especially if firms merely use the disclosure requirements as a box-ticking exercise. The cluster formation of Group 1 showed that firms with a lower quality of disclosure also did not give any reason(s) for their goodwill impairment. It seems that the firms included in Group 1 did not provide detailed disclosure of the nature of and reasoning underpinning their judgements, and this was indicated by the average of 60% in their compliance score. This could be an indication that these firms were using a box-ticking strategy to comply with the rules prescribed in IAS 36, and this could have negative consequences. Andreicovici *et al.* (2020) have shown that such an inconsistent application of the disclosure requirements could create high uncertainty among economic agents in capital markets.

8.4.2 Group 2: Mystification

Group 2 was the smallest group, with 52 sample firm years, which represented 17.40% of the total sample. Most of these firms (75%) used ‘mystification’ as their explanation strategy to give reasons for impairing goodwill, see Table 8.2. The other strategies included (untabulated) in this group were justification at 10% and concession and refocusing at 7.5% respectively.

In terms of firm size, this group was made up of the second largest group of firms (see Table 8.2). Half of this group was made up of companies in the industrials sector (50%), almost a quarter (21.15%) was made up of companies in the consumer services industry, and 15.38% of the companies belonged to the basic materials sector (not included in the table). Of the four groups, these firms had the second lowest average disclosure index score, at 0.63 (close to the index score of 0.60 of Group 1).

From the results it can be deduced that the firms using ‘mystification’ as their explanation strategy to provide reasons for goodwill impairment were mostly from the industrials sector, with the second lowest disclosure index score out of the four groups. It can therefore be concluded that firms with low levels of quality disclosure (but slightly higher than firms that provided no reason at all (those that maintained ‘silence’) for their goodwill impairment tended to use ‘mystification’. ‘Mystification’ per definition gives no further insight into the actual reason(s) for the impairment of goodwill, because the ‘reason’ provided by

management is unclear and vague. It seems that the disclosure on judgements by these firms is uninformative.

Disclosures on judgements are intended to assist users in understanding the measures used in the financial statements (Amiraslani *et al.*, 2013), and these firms fail to offer information that will help users to understand these measures better. In these cases, estimates are based on management's private information, but analysts can only verify estimates if the underlying judgements are disclosed in a clear and transparent manner. If the explanation strategy used to provide reasons for goodwill impairment is classified as 'mystification', it suggests that the information communicated through disclosure is unlikely to be informative and may be based on inappropriate calculations. This kind of opportunistic goodwill impairment disclosure increases the noise in the information communicated through disclosure and may hamper the usefulness of the information to analysts (Andreicovici *et al.*, 2020).

The central attribute that observed from Group 2 is that if the explanation strategy regarding the reasons for goodwill impairment is classified as 'mystification', the overall disclosure is low. Similarly, with Group 1, where the strategy was categorised as 'silence', the overall disclosure score was low. The results documented in Section 7.2.4 indicated that firms with a well-functioning audit committee (assumed on the basis of the expertise and independence of the committee) will provide higher quality disclosure. Therefore, if a firm has a low quality of disclosure and no reason is provided for an impairment ('silence'), or the reason given is very vague ('mystification'), it may also suggest that the firm's audit committee is not effective.

8.4.3 Group 3: Excuse

Providing an 'excuse' was a strategy pursued by all 79 companies included in Group 3, which represented 26.30% of the total sample (the second largest group). The industries of firms in this group were the consumer service sector at 29.10%, followed by the industrials sector at 26.58%.

Of the four groups, this group contained the largest firms in terms of size, as indicated by the size variable (16.67) (see Table 8.2). Therefore, large firms appear to have the highest quality of disclosure, in contrast to smaller firms, which often had lower quality of disclosure,

as documented for Group 1. With a disclosure score of 0.81, it was the group with the highest overall disclosure index score.

It thus also seems that firms with the highest quality of disclosure tend to disclose goodwill impairment, but offer an excuse as their reason for impairing goodwill. An 'excuse' is when a firm admits that an event resulted in a goodwill impairment, but blames the impairment on external circumstances, such as the market. Therefore, this group does admit to the adverse event resulting in goodwill impairment, but does not take full responsibility for it.

This was the only group which was not predominantly made up of firms from the industrials sector, and in which most firms were in the consumer services sector. In their study, Bepari *et al.* (2014) investigated firms' goodwill impairment disclosure quality and controlled for industry effects. Similar to the results from the present study, they found a positive association between the commerce industry and compliance levels. Similarly, Amiraslani *et al.* (2013) found that high goodwill-intensive industries, such as consumer services, had relatively high levels of compliance. Moreover, an earlier study by Al Jifri and Citron (2009) presented evidence that for goodwill-intensive firms, both their recognised goodwill and associated disclosures were value relevant.

Although an 'excuse' is not an acknowledgement of guilt, it can be defined as an admission that an event was bad or inappropriate. This form of disclosure is already better than providing no reason at all ('silence'), or providing a reason which is difficult to interpret ('mystification'). The firms in the sample that provided an 'excuse' had the highest quality of disclosure, suggesting that if firms provide a valid reason for impairment, even if they do not claim responsibility for it, they are also likely to provide better overall disclosure.

8.4.4 Group 4: Wordification

This was the largest group, represented by 96 sample firm years, or 32% of the total group. 'Wordification' is not providing any additional information, other than presenting the actual ZAR amount of the impairment, typed out in words, as part of the goodwill impairment note. 'Wordification' was used by all the firm years included in the group as the strategy to 'explain' goodwill impairment.

The group was mainly made up of firms in the industrials sector (43.75%), followed by firms in consumer services (19.79%) and in the technology sector (13.54%).

This group had the second highest average disclosure index score at 0.71. The group contained the second smallest size firms of the four groups, with an average size variable at 16.23. These results suggest that firms with a disclosure score of 0.71 (which is the second highest of the four groups) used ‘wordification’ to ‘explain’ their reason for impairing goodwill.

It is of particular interest that most South African firms did not provide any information content on why goodwill was impaired, other than a translation of the numbers into words. Even though this group had the second highest average disclosure index score of 71%, and thus exhibited relatively high reporting quality, management was not providing depth of disclosure.

8.4.5 Summary of groups

The aim of the cluster analysis was to determine whether a particular company profile emerged when taking into account the industry they operated in, the quality of goodwill impairment disclosure, the size of the firm and how reasons were provided for impairments. The cluster output was made up of four distinct groups. From the summary in Table 8.2, it is clear that Group 3, firms with a higher disclosure index score tended to use an ‘excuse’ when they explained the reasons for impairing their goodwill and most of these cases were in the consumer services sector. Firms with the second highest disclosure score, as represented in Group 4, used ‘wordification’ instead of a real ‘reason’ for their goodwill impairment. Firms with the second lowest disclosure index, as indicated by Group 2, used ‘mystification’ instead of a real reason for their goodwill impairment. The firms with the lowest disclosure index score, Group 1, were likely to give no reason for their goodwill impairment at all (their explanation strategy was ‘silence’), and most of these firms were small and in the industrials sector.

It was therefore important to investigate the explanations given of the reasons for goodwill impairment by management, as the strategy used could indicate the level of the disclosure quality.

8.5 SUMMARY AND FINDINGS

The results from the two-step cluster analysis gave insight into how management provided reasons for goodwill impairment, in conjunction with a firm’s quality of disclosure, the size of

the firm and industry of operations. Three out of the four groups were dominated by firms from the industrials sector – in all three, disclosure quality was lower and no clear explanations were offered of reasons for impairment, if any explanations were offered at all. Consumer services was the dominant industry for the fourth group, where disclosure quality was highest, and often an ‘excuse’ was offered to explain the reasons for impairment, but industrials came a close second.

Firms admitting to the negative implications of goodwill impairment (their explanation was framed as an ‘excuse’) had the highest overall disclosure quality. Firms that provided no reason for the impairment (their strategy was ‘silence’) displayed the lowest disclosure quality. Results from the cluster analysis suggest that how the reasons are provided by management for impairing goodwill differed depending on firms’ level of high-quality disclosure. The findings thus support H_5 , indicating that the quality of disclosure differs, based on the various reasons provided by management for impairing goodwill. Results further indicated that industry has low predictor importance and could not support the notion that the quality of disclosure differs amongst industries. *IAS 36* requires firms to provide disclosures on the judgements made in applying the accounting policy, which is intended to assist users in better understanding the measurements used to determine goodwill impairments. The results from the present study show that there was a noticeable difference between firms’ compliance with *IAS 36*.

CHAPTER 9: CONCLUSION

9.1 INTRODUCTION

Goodwill acquired as part of a business combination is recorded as an asset on the acquisition date, and it is subject to annual impairment testing as prescribed by *IFRS 3* (IASB, 2004a). The intention is that shareholders should be able to use the impairment testing information and other relevant disclosures presented in the financial statements to evaluate the entity's investment decision, and ultimately use this information to determine a value for the firm.

Standard-setting bodies such as the IASB aim to ensure that information (including information on goodwill and goodwill impairment) is presented in the annual financial report in a way that is relevant and reliable. In March 2004 the latest amendment to goodwill accounting was made when *IFRS 3* was introduced. From this date, firms were required to test annually, or more frequently if there were indicators of impairment, whether goodwill was impaired as prescribed in *IAS 36*. The intention was that with an impairment expense, more useful information would be conveyed to users of an entity's financial statements than under the previously used amortisation approach. The question of whether the value relevance of goodwill has indeed been improved by the change from the amortisation regime to the impairment-only regime is an ongoing debate, and the IASB is continuously performing post-implementation reviews of the business combination accounting framework.

The present study provides insight into the effectiveness of annual impairment testing in terms of *IFRS 3*, taking into account the literature on the topic. Previous researchers have explored whether *IFRS 3* has resulted in more value relevant information by comparing data from the period prior to and after the adoption of *IFRS 3* (Bepari & Mollik, 2017; Bugeja & Gallery, 2006; Chalmers *et al.*, 2008). Although all the results were not entirely similar, it does seem that the majority of studies found that the IASB did manage to improve the reliability of goodwill accounting by issuing *IFRS 3*. The present study focused on a post-adoption setting, when firms were already (or should be) accustomed to the changes in accounting regulations prescribed by *IFRS 3*.

Goodwill impairment charges under the impairment model are associated with economic reductions in market value, suggesting that impairment charges may reflect changes to the underlying goodwill asset better than the amortisation charge (KPMG, 2014). The discounted future cash flows and assumptions used in goodwill impairment testing are therefore likely to provide more value relevant information than the asset itself.

The aim of the present study was to determine whether goodwill, goodwill impairment and its disclosure of subsequent impairments of JSE-listed South African firms was value relevant from 2006 to 2017. The findings provide insight into whether goodwill in an impairment regime provides value relevant information. The study also gives insight into the determinants of high-quality goodwill impairment disclosure, which could enable entities to enhance the quality of their disclosure. The study considered whether the quality of such disclosure was dependent on the industry that the firm operates in, and on how the reason for goodwill impairment was disclosed by management. The results of the present study can be used by the IASB in assessing the effectiveness of the current accounting standard governing goodwill and in determining whether it improves the reliability and relevance of goodwill. The findings of the present study can contribute to the debate on whether an impairment regime provides more value relevant information than the old amortisation regime. The findings can further assist managers to comprehend the value of disclosing goodwill, subsequent impairments, and test-related disclosures in a comprehensive manner in the annual financial reports.

The present study thus investigated the value relevance of goodwill and goodwill impairments. It also explored why firms impair their goodwill and the indicators of high-quality goodwill impairment disclosures. Lastly, it analysed the different explanation strategies applied by management to provide reasons for impairing their goodwill, with reference to the quality of disclosure and the industry of operation.

9.2 SUMMARY OF MAIN FINDINGS

The summary of the main findings is presented below with reference to each of the five hypotheses.

9.2.1 The value relevance of goodwill

The first hypothesis posited that *goodwill, as accounted for in accordance with IFRS 3, is value relevant*. The findings of this study revealed that goodwill was indeed value relevant for the JSE-listed firms in the period 2006 to 2017, which is after the adoption of *IFRS 3*. By applying the Ohlson (1995) valuation technique, it was found that investors use goodwill, together with the book value of equity and net income, to determine a firm's fair value. This finding confirms the claim that the impairment regime has made goodwill more value relevant than when it was amortised annually.

The requirement of annual impairment testing requires management to determine the fair value of goodwill annually. This calculation is based on future cash flows and growth rates deemed appropriate by management. Because of the nature of goodwill and the management discretion surrounding its valuation, it might be argued that investors disregard it for decision-making. However, results from the present study suggest that investors do in fact regard goodwill as value relevant and incorporate goodwill in their assessment of firm value. Therefore, it seems that the IASB's decision to replace systematic amortisation with annual impairment testing was correct.

9.2.2 The underlying reasons for and determinants of goodwill impairment decisions

The study further investigates why South African firms might impair their goodwill. Goodwill is impaired if there are indicators of impairment at any given time, or when annual impairment testing is performed. The second hypothesis therefore posited that *there are statistically significant determinants of goodwill impairment decisions*.

The findings of the present study reveal that prior profitability, weak corporate governance, and merger and acquisition activities are significant predictors of goodwill impairment. However, firms actively involved in merger and acquisition activities are less likely to impair their goodwill. Therefore, it seems that South African firms are conservative when accounting for goodwill, and are less likely to have overstated goodwill balances. Subsequent impairment could also occur because of opportunistic behaviour by management, as predicted by prior profitability.

Corporate governance variables were found to be a predictor, because in companies with fewer board meetings, and fewer independent directors on the board of directors, goodwill

impairment was likely to increase. This finding suggests that weak corporate governance is associated with overpayment of target firms, which could result in overstated goodwill. Overstated goodwill will in turn result in subsequent impairments.

The negative prediction that prior profitability may influence goodwill impairment suggests that earnings management may be present in the companies concerned. In such an event, goodwill is then impaired where earnings are already low, which could suggest that managerial discretion is used manipulatively. Therefore, although it seems that South African firms are generally conservative when accounting for goodwill, subsequent impairments could occur because of manipulative discretion used by management. This finding highlights the importance of understanding how management determines the impairment of goodwill, which can be determined by the quality of the disclosure on the impairment testing in the financial statements.

9.2.3 The determinants of the quality of disclosure of goodwill impairment

The study identified the determinants of the quality of disclosure of goodwill impairment – the third hypothesis proposes that *certain determinants affect the quality of goodwill impairment disclosure more than others*. The findings revealed that firms with material goodwill balances are associated with higher quality goodwill impairment disclosure. Moreover, firms with an independent audit committee and at least one audit committee member with financial expertise are associated with higher quality goodwill impairment disclosure.

The findings relating to the determinants of goodwill impairment (see Section 9.2.2) suggest that firms with higher initial goodwill balances are less likely to impair goodwill subsequently. However, when firms with material goodwill balances do impair goodwill, this event is likely to be accompanied by higher quality disclosure of that impairment. High-quality disclosure of goodwill impairment should assist users of financial statements to comprehend reported goodwill and impairments better, and to understand the estimates used by management to determine the value of goodwill and impairments.

From the presents study's results, it seems that firms with larger (material) goodwill balances are more accustomed to the requirements prescribed by *IFRS 3*, and this is evident from the higher quality disclosure these firms provided of goodwill impairment. However, high-

quality disclosure in respect of goodwill and its impairment should not be limited to firms with large goodwill balances.

The results also suggest that if a firm has a well-functioning audit committee, it could lead to higher quality disclosure of goodwill impairment, but the results did not indicate any industry effect on the quality of goodwill impairment disclosure.

9.2.4 The value relevance of goodwill impairment and its disclosure

The fourth hypothesis was that *goodwill impairment and its disclosure are value relevant*. This hypothesis could not be supported as the findings presented evidence that goodwill impairment is not value relevant. Furthermore, goodwill impairment disclosure had a negative association with firm value.

Nevertheless, there was evidence that when goodwill impairment and its disclosure are considered *together*, that does have a positive impact on firm value. Therefore, if investors assess goodwill impairment in isolation, they do not seem to use it to determine fair value. However, if firms provide investors with impairment test-related disclosure regarding goodwill impairment, it will have a positive effect on their decision-making. This confirms the notion that goodwill impairments are associated with possible earnings management as a result of managerial discretion, and investors may be cautious when they analyse goodwill impairments. The finding that the test-related disclosure of goodwill impairment can change the way investors view goodwill impairment should encourage management to ensure that it provides high-quality disclosure of goodwill impairment.

9.2.5 The association between the quality of goodwill impairment disclosure, how management provides reasons for impairment, and industry of operation

The final hypothesis was aimed at providing insight into how management provides ways in which reasons are provided for goodwill impairment, in conjunction with the level of a firm's quality of disclosure, the size of a firm and industry of operations. The fifth hypothesis stated that *the quality of goodwill impairment disclosure differs, based on the various ways in which reasons are provided by management for impairing goodwill, and the quality of goodwill impairment disclosure differs amongst industries*.

It was found that the firms with the highest quality of disclosure were in the consumer services sector, while the rest with fair disclosure quality were predominantly in the industrials industry. The firms that admitted to the negative implications of goodwill impairment (the ones that made an effort to provide an excuse) had the highest overall disclosure quality. The firms that provided no reason for the impairment (the ones that employed silence as a strategy instead of actually explaining the event) also displayed the lowest disclosure quality. Therefore, the ways in which reasons are provided by management for impairing goodwill do indeed differ for firms, depending on the level of the quality of their disclosure. This finding suggests that there is a correlation between the type of explanation of the reason provided by management (management's explanation strategy) and the quality of disclosure.

9.3 CONCLUSION AND SUMMARY OF THE FINDINGS

The study investigated several aspects regarding goodwill and goodwill impairments in a setting after the adoption of *IFRS 3*, focusing on JSE-listed firms between 2006 and 2017. Although goodwill was found to be value relevant, it seems that the impairment charge in itself did not have an influence on firm value. However, when goodwill impairment was accompanied by goodwill impairment test-related disclosure, investors did seem to take impairment into account in valuing a firm. The size of a firm did not seem to have a statistically significant impact on the quality of disclosure, but the size of a firm's goodwill *balance* did. Firms in the sample that were more actively involved in merger and acquisition activities were likely to incur less goodwill impairment, but when they did, the event tended to be accompanied by higher quality disclosure of the event. These findings suggest that irrespective of the size of a firm, if the goodwill balance is material and the firm is active in merger and acquisition activities, the firm is more likely to comply with *IFRS 3*. The higher quality of disclosure on goodwill impairment provided by these firms could indicate that they are more accustomed to the accounting standards requirements.

The study found that for this sample of South African firms, goodwill impairment was associated with a decrease in profitability, which could suggest the presence of earnings management. The literature suggests that firms with declining profits are more likely to take discretionary hits to already low profits. The present study's finding that goodwill impairment, as long as it was accompanied by goodwill impairment test-related disclosure, was positively associated with firm value, could suggest that when firms provide high-quality disclosure,

they reduce the risk of suspicion of potential earnings management. The requirement for high-quality disclosure is an incentive to firms to provide detailed information on the estimates and assumptions used in determining the fair value of goodwill. Because investors appear to use goodwill impairment *together* with goodwill impairment test-related disclosure in their decision-making, it can be concluded that investors perceive firms with high-quality disclosure to present truthful results, without manipulating earnings. A lack of goodwill impairment test-related disclosure could, however, indicate that earnings management is present, which could in turn result in investors' not regarding goodwill impairment as value relevant.

The presence of strong corporate governance mechanisms is associated with lower goodwill impairments, which implies that a strong ethical environment in a firm discourages overpayment for target firms. The presence in a firm of an audit committee made up of a majority of independent members, and at least one committee member with financial expertise, is associated with higher quality disclosure. It is therefore important for a firm to ensure that its audit committee is independent and that the committee includes members with the necessary financial expertise.

Firms are not required to give explicit reasons for the impairment of goodwill, but are likely to do so to ensure completeness of the financial statements. The explanation strategy used by management provide reasons can be used to predict the quality of disclosure. Firms that provide an excuse for impairing goodwill are likely to have higher quality disclosure, whereas firms providing no reason for their goodwill impairment are likely to have lower quality disclosure.

9.4 LIMITATIONS OF THE STUDY

A general limitation of the present study was that it worked with an unbalanced data panel. However, the randomness of which values were missing mitigates potential bias. Nevertheless, it is acknowledged that the results from the sample should not be generalized.

9.5 REFLECTION ON CONTRIBUTIONS, AND RECOMMENDATIONS

The results of the present study indicates that investors deem goodwill value relevant in a setting after the adoption of *IFRS 3*. The study period was specifically selected to ensure that the firms included in the sample were already (or should be) accustomed to the

requirements of the standard. It can therefore be concluded that the standard setters did manage to improve the reliability and relevance of goodwill, and that it was the correct decision to replace systematic amortisation with annual impairment of goodwill.

A key contribution of the study is evidence on the importance of goodwill impairment test-related disclosure. Firstly, the study has confirmed that there are specific determinants of high-quality disclosure regarding impairment. Secondly, the study has shown that investors deem goodwill impairment when they assess it *together* with test-related disclosure. Therefore, the study makes a contribution to insight into the worth of the provision goodwill impairment test-related disclosure by managers and preparers of financial statements. The cost of complying with the disclosure requirements is high and the volume of disclosure may seem excessive. However, an improvement to the value relevance of goodwill disclosure will not necessarily be accomplished by increasing the volume of required disclosure – disclosure would instead be enhanced if goodwill impairment disclosure were consistent amongst entities, which can be achieved by more detailed guidelines in the relevant accounting standards. It could also be useful to investors to be given more insight into the financial statements that show the status of acquired businesses and the goodwill that is recognised, even if no impairment is recognised. This could enable investors to review the subsequent performance of an investment in a pro-active manner. If detailed disclosure is only presented once goodwill has been impaired, that could keep information on poor performance by investments from investors. However, if firms are required to provide more detailed information on goodwill on an ongoing basis, potential agency costs could be reduced, as investors will be able to anticipate an impairment, and the risk of earnings management embedded in goodwill impairments could be mitigated.

This study has also provided evidence that South African firms with good corporate governance mechanisms in place are less likely to impair goodwill. This could indicate that strong corporate governance discourages firms from overpaying for target firms in the first place and this in turn results in fewer impairment charges. In the present study, indicators of corporate governance (such as the independence of board members and the frequency of board meetings) were also indicators of less goodwill impairment. Board independence and the frequency of board meetings are some of the mandatory requirements set out in the King report, and these requirements are intended to ensure that timely and understandable information is presented in the financial reports. The findings of the present study indicate

that the recognition of goodwill was done in an appropriate manner by the sample firms, as investors viewed goodwill as value relevant, suggesting that overpayment was not likely to occur at acquisition. Goodwill impairment testing and related disclosure was an indication of the status of the acquired assets and was a direct result of the purchase price at acquisition date.

Another contribution of the present study is to demonstrate the importance of a well-functioning audit committee, which in turn could improve the quality of disclosure. The study presented evidence that if goodwill impairment is accompanied by goodwill impairment test-related disclosure, investors use the information in their decision-making. The results showed that if a firm's audit committee consisted of independent members, and at least one of the members had financial expertise, the quality of disclosure was better. This could indicate that an independent audit committee could help to improve the quality of disclosure of impairment presented by a firm's management, which could in turn improve the overall quality of financial information presented by a firm.

The final contribution of the study is to shed light on the explanation strategies used by management in providing reasons for impairing goodwill. The findings revealed that firms that chose to keep silent and not provide any reason for impairing goodwill also tend to have low levels of goodwill impairment disclosure. These firms were predominantly from the industrials sector. By contrast, the firms with the highest average regarding high-quality goodwill impairment disclosure were in the consumer services industry, and they provided an excuse for impairing goodwill. Although these firms were not taking responsibility for impairing goodwill, they did at least provide more insight into the reasons for the goodwill impairment. And as mentioned earlier, goodwill impairment accompanied with test-related disclosure is regarded as value relevant by investors.

9.6 SUGGESTIONS FOR FUTURE RESEARCH

The study has presented evidence that firms with material goodwill balances have higher quality disclosure of goodwill impairment, but no industry effect was identified. The results did, however, indicate that firms from the consumer services industry were likely to provide higher quality disclosure. Future research should explore whether industries which are goodwill-intensive provide higher quality disclosure and whether their goodwill is more value relevant than industries which are not as goodwill intensive.

The underlying theory in the present study was the agency theory. The results suggest that the risk of earnings management was mitigated by strong corporate governance mechanisms. The quality of disclosure testing can be adjusted in future research to confirm that agency costs are not a concern. Future research should aim to check that firms are not preparing financial statements and disclosing information merely by box-ticking the requirements in the accounting standard, but truly add value to financial reports. This can be done by applying a similar disclosure index, but determining whether the disclosed information changes between reporting periods, or whether the information is simply duplicated.

The assumptions used for goodwill impairment testing, such as the growth rate of future cash flows and the discount rate, can be analysed in future research to determine the validity and truthfulness of goodwill impairments. The value relevance of goodwill impairment is a direct result of the inputs used, which implies that a detailed scrutiny of these variables is warranted. This could elucidate further the present study's finding suggesting that goodwill impairment is not value relevant if the impairment is viewed in isolation.

9.7 CONCLUDING REMARK

The present study has enhanced insight into the value relevance of goodwill and its subsequent impairments, and into the quality of goodwill impairment disclosure. Understanding goodwill can assist investors to analyse the success of an acquisition and get better insight into the future performance of an organisation. The findings of the present study provide evidence that aids understanding of goodwill impairments and the quality of its disclosures, thereby enhancing knowledge of the effectiveness of the implementation of *IFRS 3*.

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APPENDIX A: DISCLOSURE REQUIREMENTS UNDER IAS 36

IAS 36 requires the disclosure of estimates and judgements used in estimating goodwill impairment losses in the notes to the financial statements (IASB, 2004b). This appendix sets out the detailed disclosure requirements contained in IAS 36 §134 to §135.

Common disclosure for each CGU for which goodwill is allocated:

- a) the carrying amount of goodwill allocated
- b) the basis of recoverable amount (value in use or fair value less cost of disposal).

Disclosures required if the recoverable amount is based on the value in use:

- a) the key assumptions on which management has based its cash flow projections
- b) a description of management's approach to determining the value(s) assigned to each key assumption
- c) the period over which management has projected the cash flows, and if a period longer than five years was used, justification of the longer period
- d) the growth rate used to extrapolate cash flow projections beyond the period covered in the projections
- e) the discount rate(s) used to the cash flow projections

Disclosures required if the recoverable amount is based on fair value less cost of disposal:

- a) the valuation technique used to measure fair value less cost of disposal

Disclosures when fair value is not based on a quoted price for an identical unit

- a) each key assumption on which management has based its determination of fair value less cost of disposal
- b) a description of management's approach to determining the value(s) assigned to each key assumption
- c) the level of the fair value hierarchy
- d) if there is a change in the valuation technique, the change and the reason(s) for making it

If fair value less costs of disposal is measured using the discounted cash flow projections

- e) the period over which management has projected cash flows

- f) the growth rate used to determine cash flow projections
- g) the discount rate(s) applied to the cash flow projections

If a reasonable possible change in a key assumption of the unit's recoverable amount would cause the unit's carrying amount to exceed its recoverable amount

- a) the amount by which the unit's (group of units') recoverable amount exceeds its carrying amount
- b) the value assigned to the key assumption
- c) the amount by which the value assigned to the key assumption must change in order for the unit's (group of units') recoverable amount to be equal to its carrying amount

If the carrying amount of goodwill allocated to each CGU is not significant, that fact must be disclosed. Furthermore, the aggregate carrying amount of goodwill allocated to those units must be disclosed. In addition, if the recoverable amounts of any of those units are based on the same key assumption(s) and the aggregate carrying amount of goodwill allocated to them is significant, that fact should be disclosed. The following should also be disclosed:

- a) the aggregate carrying amount of goodwill allocated to those units
- b) a description of the key assumption(s)
- c) management's approach to determining the value(s) assigned to the key assumption(s)
- d) whether a reasonable possible change in the key assumption(s) would cause the aggregate of the units' carrying amounts to exceed the aggregate of their recoverable amounts, and
- e) whether the amount by which the aggregate of the units' recoverable amounts exceeds the aggregate of their carrying amounts.

APPENDIX B: PROOF OF EDITING

10 October 2020

TO WHOM IT MAY CONCERN

I confirm that I have edited the language in the thesis entitled The value relevance of goodwill and its disclosure for companies listed on the JSE by Elmarie Louw.

The editing was done electronically, using Track Changes, to enable the candidate to accept or reject the suggested changes, thus retaining her authorial discretion and right to assert authorship. The editing included checking the format of the referencing and general formatting in line with the guidelines of the University of Pretoria supplied to me by the candidate.

I assert that I am qualified to do such editing, as I have a DLitt in English, have lectured English at the University of Pretoria since 1985, and have been a freelance editor since 1990. I have also offered courses in Editing: Principles and Practice at the undergraduate and graduate levels for more than 22 years.

I declare that I undertake editing in my private capacity, with the permission of my employer. My employer takes no responsibility whatsoever for the editorial suggestions made in the course of this work.

Yours faithfully



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