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A review of research performed on the approach to the subsequent measurement of goodwill

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Orientation: By taking stock of goodwill accounting literature, the article identifies key themes and highlights the lack of innovation in goodwill and intangibles' accounting evolution.

Research purpose: This article suggests pure grounded theory research is required to develop a novel perspective on goodwill accounting.

Motivation for the study: Little progress has been made to overcome the dated issues related to goodwill impairment necessitating a genuinely fresh approach.

Research approach/design and method: A search was performed on the Scopus Database and all sources containing a combination of 'goodwill' and 'impairment', 'amortisation' or 'depreciation' in the title, abstract or keywords were extracted. A total of 231 sources from 1990 to 2022 are analysed. These are coded with the support of a content analysis and a bibliometric analysis.

Main findings: This research identifies the dominance of positivist quantitative research and financial economics as a key issue that may be holding back progress on the subsequent treatment of goodwill. The research iterates three core issues, namely: (1) that the impairment-only approach allows too much managerial discretion, (2) an inability to reasonably estimate the useful life of goodwill deters many from supporting goodwill amortisation and (3) sometimes goodwill may be a wasting asset while others may genuinely have an indefinite useful life.

Practical/managerial implications: This research may be relevant for standard setters when considering goodwill accounting methods.

Contribution/value-add: The research provides insights into existing literature and highlights areas for future accounting research.

Keywords: agency theory; amortisation; depreciation; goodwill; impairment; value relevance.

Introduction

Globally, goodwill is a key asset in many companies' statement of financial position (Lev 2018a, 2018b). In 2020, goodwill of over $8 trillion was recognised, representing approximately 18% of total equity (International Financial Reporting Standards [IFRS] 2023). Given the significance of this asset class, it is surprising that the International Accounting Standards Board (IASB) has not overhauled International Accounting Standard 38 – Intangible Assets (IAS 38) since its development in 1998. While many researchers argue that the standard needs to relax the stringent requirements to recognise and revalue intangible assets (Maroun et al. 2022), this is not the focus of this article but rather, the IASB's subsequent measurement agenda item (IFRS 2023).

While the IASB has tentatively decided against reintroducing goodwill amortisation (IFRS 2023), there are still many that support amortisation as seen by the feedback received on their Discussion Paper (IFRS Foundation 2020). Typical systematic amortisation approaches have their place but may be inappropriate for some types of modern intangible assets. The usefulness of testing goodwill for impairment annually has attracted much debate. On the one hand, goodwill is not viewed as an asset that depreciates systematically. On the other hand, impairment losses are argued to be recognised too late to provide useful information (Duangploy, Shelton & Omer 2005; Eloff & de Villiers 2015).

Although the IASB has tentatively disregarded reinstituting goodwill amortisation, the goodwill accounting is still on the agenda (IFRS 2023). This article explores the academic research on goodwill accounting to identify trends which may provide insights into the evolution of goodwill

Note: The numbers in square brackets are references to the notes at the end of the article under 'Notes' on page 13 of 15.

accounting. A content and bibliometric analysis is used to assess 231 academic sources included in the Scopus Database from 1990 to 2022 dealing with topics related to the amortisation or depreciation and impairment of goodwill. The article provides a useful reference point for practitioners and academics interested in the debate concerning goodwill accounting and how this is viewed in different jurisdictions.

By *taking stock* of the goodwill accounting literature, the article identifies key themes and that a lack of innovation has shaped the evolution of goodwill and other intangibles' accounting. The dominance of research from developed countries with sophisticated information technology systems and financial modelling provides useful insights into goodwill's development in line with financialisation arguments summarised by Zhang and Andrew (2014).

The remainder of this article is structured as follows: The section 'Brief overview of goodwill' provides a brief overview of goodwill. The subsequent section details the search protocol established to obtain the academic sources and the methodology applied to assess the publications and the following section provides the thematic analysis developed from the bibliometric analysis. The section thereafter presents an overview of the development of goodwill accounting while the succeeding section deals with the volume of goodwill research and the jurisdictional analysis. The accompanying section discusses the focus of research, epistemological perspectives and methodologies used in goodwill research. The final section presents the conclusions and future areas for research.

Brief overview of goodwill

Goodwill is an intangible asset that arises in a business combination where the aggregate of the consideration paid and the value of non-controlling interests exceed the fair value of the net assets of the acquiree (IASB 2021). Goodwill represents 'the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognised' (IASB 2021). Accountants generally agree that goodwill has a finite life but that is impractical to estimate its useful life. Consequently, it is classified as an indefinite (not infinite) useful life asset that must be tested for impairment annually (IASB 2021).

The test for impairment is inherently complex and requires significant managerial judgement and the use of estimates cannot be verified (Ferramosca & Allegrini 2021). The significant managerial discretion raises questions about the relevance and faithful representation of current goodwill reporting practices and whether they accurately reflect the true economic phenomena. The concerns surrounding goodwill impairment are not new and the numerous changes made to the accounting standards are evidence of this fact (Eloff & de Villiers 2015). In 2009, the IASB reintroduced the amortisation of goodwill for small and medium enterprises. The United States' Financial Accounting Standards Board (FASB) followed suit and modified its standards in 2018 to allow private entities increased discretion in accounting for goodwill by way of an election between amortisation and impairment approaches. This has allowed entities, particularly those with less resources, to be able to account for goodwill without incurring excessive costs associated with impairment estimates (Martínez, Rubio & Morales 2023). This adoption does, however, impact the comparability of financial information (Kaipova, Assanova & Serikbayeva 2022).

Current IFRS outline the application of an impairment-based approach which has led to an increase in the complexity and subjectivity of accounting for goodwill in comparison to prior practice that encompassed a basis of systematically amortising goodwill over time (Duangploy et al. 2005). The impairment of goodwill, in contrast to an amortisation method, allows managers to utilise discretion in determining a more accurate representation of the economic reality of an entity based on their deeper understanding of the business (Hamberg & Beisland 2014). This increased managerial discretion, however, allows for more opportunistic accounting and can be used to manipulate financial results as goodwill impairment decisions may be influenced largely by managerial incentives (Choi & Nam 2020). The question of whether IFRS 3 [1], issued by the IASB in replacement of IAS 22 [2], has increased the reliability and relevance of the information presented and disclosed on goodwill impairment remains unanswered (Eloff & de Villiers 2015).

The recent rise in corporate failures and scandals has led to a lack of confidence in not only the audit process but also in the ability of financial reporting to provide useful information (Bhaskar & Flower 2019). In particular, goodwill, that is not subsequently reassessed *appropriately* for impairment, may be used to inflate the asset balance and influence investment decisions and the evaluation of the success of mergers and acquisitions (Styan 2018). The managerial discretion of goodwill impairment often leads to opportunistic motivations such as delaying the impairment of goodwill and the complexities of the impairment model make it difficult to validate and audit the estimates (Filip, Jeanjean & Paugam 2021; Han & Tang 2020; Knauer & Wöhrmann 2016; Li & Sloan 2017). The amortisation model, in contrast, is found to display an inversely proportional relationship with this excess goodwill. This raises the question of whether the amortisation model has the potential to minimise the manipulation of goodwill accounting in preventing fraudulent accounting (Wang et al. 2021).

In November 2022, the IASB voted to retain the impairment-only approach to account for goodwill and proposed enhanced disclosure requirements on the subsequent performance of an acquisition (IFRS 2023). This tentative decision culminates in an evaluation of the accounting standard that began in February 2015. The IASB noted that there was not a 'compelling case' to change the current method of accounting for goodwill but suggested that there

may still be improvements and simplifications to the impairment test before the final exposure draft is published (IFRS 2023).

While the IASB's decision to retain the impairment-only approach for goodwill accounting resonates with proponents [3] of providing more relevant and useful information, there is still room to assess how the academic literature has responded to proposed changes to goodwill accounting.

Research design

This study assesses the trends in goodwill accounting research in relation to impairment, amortisation and depreciation. This forms the basis of the research question which explores a thematic analysis of goodwill accounting, an overview of the history of goodwill accounting, the quantum and location of research, the research methods used and the epistemology, and focus of research. To do so, prior literature on goodwill accounting is analysed and coded with the support of a content analysis and a bibliometric analysis.

Search protocol

The Scopus Database was used to obtain academic sources because of the quality of its filtering criteria (Dumay et al., 2016; Rinaldi, Unerman & De Villiers 2018) and the fact that it includes journals of good standing with robust peer-review processes in place (Ecim & Maroun 2023). Combinations of 'goodwill', 'depreciation', 'amortisation', 'amortization' and 'impairment' were used to search articles' titles, keywords and abstracts for relevant studies. The subjects were filtered and limited to incorporate business, management and accounting articles. All document types were assessed and included 'final' and 'in press' publications. The start date for the search was 1990 being the earliest available study on the Scopus Database until 2022 at the time of data collection resulting in 397 publications. Two of the authors reviewed the abstracts of all articles individually as a type of 'blind peer review' to eliminate publications that, despite their keywords, did not relate to goodwill in the context of business, management and accounting. This involved analysing the purpose and findings of the articles to determine their relevance and suitability for the current study in the context of accounting for the subsequent measurement of goodwill. Articles that did not fit with the scope of the study were removed. For example, certain articles included the relevant keywords but were related to social studies of 'goodwill' or impairments related to other assets. Additionally, some articles were duplicated as a result of containing multiple keywords and the duplications were removed. The third author reviewed both the final list of publications as well as those that were eliminated to confirm the accuracy and completeness of both the initial search and the subsequent removal of articles. Table 1 summarises the documents assessed [4].

This article assumes that researchers flag the key themes of their studies in the titles, keywords and abstracts appropriately but there is a risk that some relevant studies have been excluded because of the absence of our search words in their titles, keywords or abstracts. These should be exceptions and are considered unlikely to materially impact the results of this article. Similarly, by only using the Scopus Database, other relevant articles from other databases would not form part of the dataset. This should not materially impact the results which highlight key trends and does not aim to provide an absolute account of every publication. Instead, a broad sense of the literature used by academics is achieved by way of the analysis of 231 documents and is in line with prior studies of a similar nature (Dumay et al. 2016; Ecim & Maroun 2023; Rinaldi et al. 2018).

Content and bibliometric analysis

Each publication included in the sample was classified according to research objectives, methodology, focus of enquiry and epistemology (see Table 2) (adapted from Dumay et al., 2016; Rinaldi et al. 2018). Broad categories are used to get a sense of the literature which limits subjectivity and is a common approach in bibliometric analyses (Lopes & Penela 2021; Qu & Dumay 2011; Rinaldi et al. 2018).

The bibliometric analysis is used to provide an overview of the relationships, volume and impact of research through citations, co-citations, bibliographic-coupling and keyword co-occurrence analyses (Lopes & Penela 2021). A thematic analysis diagram identifies research themes and explores future avenues for goodwill accounting research. This is done using a keyword co-occurrence analysis which maps

TABLE 1: Publications assessed.

Keywords applied	Initial number of documents	Number of irrelevant or duplicate publications [5]	Final number of publications
'Goodwill' and 'depreciation [6]'	29	- 20	9
'Goodwill' and 'impairment'	272	- 68	204
'Goodwill' and 'amortisation [7]'	96	- 31	65
Duplicate publications	–	- 47	- 47
Total	**397**	**- 166**	**231**

Note: The numbers in square brackets are references to the notes at the end of the article under 'Notes' on page 13 of 15.

TABLE 2: Collection of data for analysis.

Focus	Details
Publication details	• Title; Year of publication; Author(s); Number of citations; Affiliations; Jurisdiction; Keywords; Publishing body/journal
Methodology [8]	• Quantitative • Qualitative • Mixed
Research paradigm	• Positivism – encompasses objectivity and factual data to explain relationships • Interpretivism – is based on a subjective analysis and understanding of phenomena from an individual's perspective • Critical – involves an element of interpretivism but is more interrogative in nature and judgement of reality
Level of research – focus of enquiry	• Conceptual – publications which analyse goodwill at a conceptual level such as theoretical studies • Mix of empirical and theory – publications which deal with goodwill within certain industries or organisations, such as research using multi-company case studies • Empirical only – focus on the application of goodwill on specific subject matters, such as single-company case studies

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the frequency of articles with the same keywords. This is indicative of articles which have connected themes (Caputo et al. 2021). VOSviewer software is used to generate textual and graphic representations of the results (Lopes & Penela 2021; Myeza, Ecim & Maroun 2023; Van Eck & Waltman 2017). In addition, descriptive and inferential statistics is used to analyse the data.

Thematic analysis of goodwill accounting

The keyword co-occurrence analysis of the 231 publications resulted in five clusters of themes that were used as open codes to create a 'data mind map' (adapted from: Holland 1998). The results are presented in Figure 1.

The process of identifying key themes allows for analytical reflexivity and the incorporation of the researchers' judgement, experience and professional expertise as an integral part of evaluating how goodwill accounting has developed over time. The themes are analysed in Table 3.

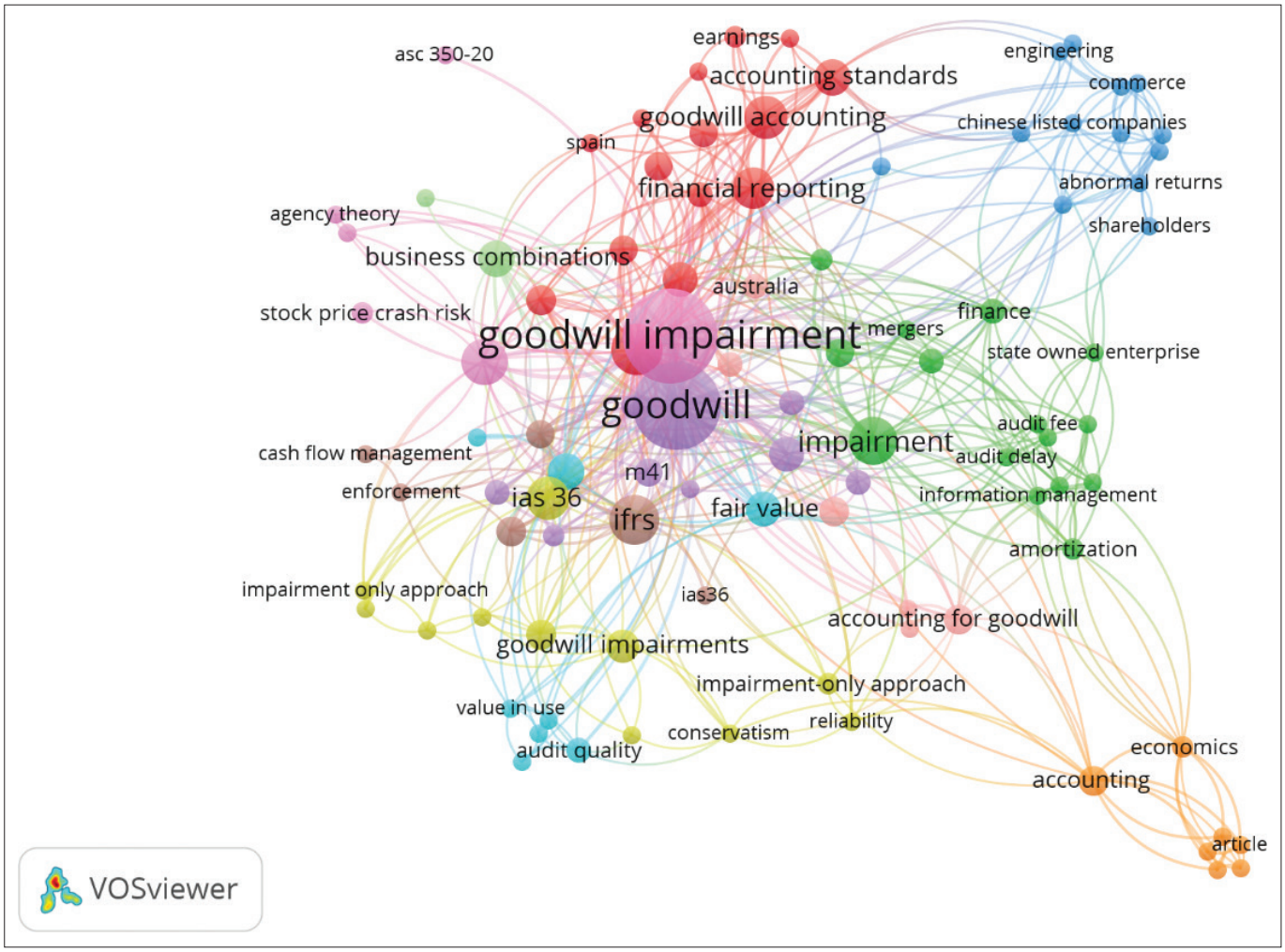
Theme 1 encompasses subsequent measurement of goodwill and agency theory. This theme involves an analysis of the development of the accounting standards and practices that have been used to measure goodwill. It links developments to agency theory where financial reporting is a key mechanism to reduce agency costs and allow users to hold management accountable (Bricket & Chandar 1998; Ramanna & Watts 2012; Watts & Zimmerman 1983).

This finding identifies that one key issue is whether or not the current impairment-only approach provides sufficient information to reduce agency costs. If managers have too much discretion over impairment calculations, it may

TABLE 3: Core themes identified based on the co-occurrence analysis.

Theme number and title	Cluster colours	Examples of core ideas
1 Goodwill subsequent measurement	Pink and purple	Goodwill write-offs, agency theory and managerial discretion
2 Technical requirements	Red and yellow	IFRS 3, IAS 36, asset valuation, disclosure quality, conservatism and reliability
3 Balancing compliance with earnings management	Green	Write-downs, information management, business combinations, identified intangible assets and audit delays
4 Market reactions	Dark blue	Abnormal returns, stock price, profitability and shareholders
5 Other	Light blue	Cultural context, fair value, audit quality and value-in-use

IFRS, International Financial Reporting Standards; IAS, International Accounting Standard.



ifrs, International Financial Reporting Standards; ias, International Accounting Standard.

FIGURE 1: Data mind map cluster analysis.

increase agency costs as users need to find alternate means to deal with goodwill and whether or not its stated value can be trusted to represent the genuine aggregate of economic benefits stemming from unidentifiable assets the group controls. For example, users may need to evaluate whether they think the group's performance and position reflected in the financial statements indicate that there is a significant risk that management was incentivised to use goodwill impairment testing to manipulate the financials (Choi & Nam 2020). Goodwill impairment recognition can be accelerated, timely or delayed which may be driven by managerial incentives such as meeting analyst targets, share price manipulation, signalling and legitimacy considerations (Van Zijl, Wöstmann & Maroun 2017), income smoothing, avoidance of reporting on losses in the current year or reporting on larger losses in the current year to make future results appear better (Choi & Nam 2020).

As a result, the discretion over goodwill recognition and the subsequent measurement, including the related accounting, calculations, market perceptions and management incentives is an important area for consideration. This should include a multi-jurisdictional analysis of not only the goodwill impairment recognised by organisations but also the additional facts and circumstances surrounding the context of the impairment and timing of recognition.

Theme 2 covers the technical debates about the theoretical and practical arguments affecting goodwill's subsequent accounting. The idea that goodwill has an indefinite useful life is an example. Another is the argument that too often goodwill impairments are recognised after it was already obvious to users that goodwill was likely impaired. In this case, studies question whether the impairment-only approach is adding value (e.g. Golden, Sun & Zhang 2018). As with current IASB focal areas, disclosure of goodwill and impairment tests are also considered.

Theme 3 deals with other practical elements of the goodwill impairment debate. For example, how goodwill impairment testing is mobilised to engage in earnings management and how the information required to perform impairment tests is gathered and processed (Li, Shroff & Venkataraman 2005). The impact of annual goodwill impairment tests on the time required to audit large companies and associated fees are also discussed. Specifically, whether the costs of annual tests and their audit exceed the value of holding the asset and the recognition of impairments (especially if delayed) (Tsakumis 2007).

Theme 4 looks at the impact of goodwill and goodwill impairments on share prices. This kind of value-relevance research is important for understanding and contributing to the consideration of whether the cost of the impairment-only approach warrants its continued use. Implications for profit are contrasted between amortisation and impairment-only models (Ferramosca & Allegrini 2021; Jennings, LeClere & Thompson 2001; Linsmeier & Wheeler 2021). The market reaction to goodwill impairments is more erratic and unpredictable compared with a systematic amortisation approach. Market participants react negatively to goodwill impairments, although there has usually already been a decline in the company's share price or profitability before the announcement of the impairment (Li et al. 2005).

Theme 5 houses the other minor aspects that are still commonly found in the literature. For example, the impact of the impairment-only approach on audit quality (Albersmann & Quick 2020). As the impairment test requires the company to estimate the fair value for highly complex and multifaceted businesses, the audit of those impairments is often a key audit matter for audit teams (Ecim, Maroun & Duboisee de Ricquebourg 2023). Often, auditors are reliant on non-accounting experts to form an opinion on the impairment tests. Even with experts, it is difficult to substantively justify why an audit client's goodwill impairment test is deficient save for obvious mathematical and financial modelling errors (Pandya, Van Zijl & Maroun 2021). The traditional 'Big 4' audit firms would likely be better equipped to deal with issues relating to impairment (Nguyen & Kend 2021).

Other aspects of Theme 5 include the reaction of market participants being influenced by the level of managerial discretion and legal regulations within the country, the amount of the losses as well as whether the factors contributing to the impairment are internal or external in nature (Li et al. 2005). In addition, the value relevance of goodwill accounting and current practice is determined by its application within specific contexts. For example, culture may play an important role in the extent to which managerial discretion reduces the usefulness and timeliness of goodwill impairments (Tsakumis 2007). Historical and cultural practices are intrinsic factors that impact corporate culture as well as accounting practices and this cannot be disregarded by standard setters (Tsakumis 2007; Van Zijl & Maroun 2017).

To provide context, cultural considerations are prevalent in Japan and can be examined by contrasting corporate group associations between Japan and Anglo-American nations (Kobori 2020). Japan's culture of interrelatedness is reflected in their close business relationships and can be seen in the prominent smaller shareholding and decentralised cross holding share ownership patterns. As a result, Anglo-American consolidation practices are not necessarily an appropriate reflection of the actual nature of Japanese corporations. Japan's decision to maintain the amortisation approach instead of the newer impairment model is a result of the historical mandatory implementation of market valuation of listed entities during the 1990s to 2000s (Kobori 2020). The Japanese stock market became overvalued following increases in the Bank of Japan's discount rate in the 1980s and their extension of credit to several firms as part of an aggressive fiscal strategy to improve economic growth. Stock prices were influenced by land values, but the decision to strengthen lending costs in 1989, and a decrease in land prices led to the fall of the stock market in the 1990s (Patrick 1998). To prevent the economic hardships experienced during this time, Japanese standard setters follow a more conservative accounting framework, including the amortisation approach of goodwill along with impairment (Kobori 2020).

Information conveyed by Japanese consolidated statements should be interpreted differently from Anglo-American firms as the corporate group nature and structures need to be understood. The rationale for the formation and adoption of accounting standards by different countries needs to be understood in examining the feasibility and desirability of the harmonisation of accounting standards and practices (McKinnon 1984). This indicates that the harmonisation of standards is not always practical given the country-specific influences which impact accounting developments but this may also hinder the comparability of financial statements across countries (Tsakumis 2007). These inherent cultural factors ultimately impact the implementation of a universal standard by different jurisdictions which may also extend to the varying cultures and practices within organisations in the same jurisdiction as well (Petersen & Plenborg 2010). Resistance to changes in accounting standards by preparers of financial statements may also hinder the adoption of innovative and new standards (Maroun & Van Zijl 2015 2022) and include the perceptions of stakeholders (De Freitas et al. 2024) and legitimacy of financial reporting standards (Van Zijl & Maroun 2017).

Related to culture is the impact of audit quality. Put differently, higher quality audits may mitigate the extent to which impairment recognition is delayed. In addition, the implementation of good corporate social responsibility practices reduces management's motives to manipulate goodwill and the underreporting of impairment losses (Golden et al. 2018).

The findings that culture, jurisdictional enforcement of regulations and audit quality impacts the goodwill subsequent accounting debate suggest that subsequent measurement decisions are not a simple case of a 'one size fits all' approach and research on jurisdictional context and application needs to be prioritised (Golden et al. 2018). As the IASB caters to over 166 countries that include a wide variety of different cultures and degrees of regulation enforcement, the IASB must take culture and jurisdictional context into account. If an approach offers too much discretion to engage in prudent or aggressive accounting while another does not, this should be an important factor in deciding which approach the IASB should favour. That, or they should at least implement some mechanism to ensure companies are not unfairly prejudiced. The 'Overview of goodwill accounting based on the academic literature assessed' will explore the history of goodwill accounting based on the review of the academic literature.

Overview of goodwill accounting based on the academic literature assessed

The earliest descriptions of goodwill date back to 1571, and the oldest known definition was made in 1882. The definition is found in Bithell's 'A Counting House Dictionary' as cited by Ratiu and Tudor (2012):

> The advantage connected with an established business of good repute. A well-established business presents an expectation of profits to anyone entering upon it and is worth paying for. Anyone having such a business and who is willing to relinquish the expectation of the business by transferring it for consideration to someone else can do so by what is technically called selling the Goodwill of that business. (p. 56)

The sentiments outlined in this definition, although rudimentary, are echoed in the current understanding of goodwill, with particular reference to goodwill as beneficial and creating the expectation of profits in the future (Ratiu & Tudor 2012).

Before the implementation of goodwill standards, there were three schools of thought when accounting for goodwill. The first consisted of the complete write-off of goodwill at acquisition with a corresponding entry in the equity section of the financial statements. The second school of thought, contrary to this, advocated for neither the write-off nor the accounting for depreciation of goodwill in the operating expense account of the entity unless there was sufficient and strong evidence to support the decrease in asset – similar to an indicator of impairment. The last encompassed the systematic amortisation of goodwill (Seetharaman, Balachandran & Saravanan 2004).

To understand which method may be the most appropriate, it may be necessary to understand the role played by decision-useful accounting information in reducing agency costs by allowing for the monitoring of the relationship between the principal and the agent, in line with the stewardship concept (Bricket & Chandar 1998). Agency theory highlights the importance of financial reporting in communicating information which is useful to principals to reduce the risk posed by agency costs and allow for sound decisions to be made by principals (Antwi 2021). This decision-usefulness concept results in tension with the stewardship principles as not all information may be useful, whereas, the neoliberal paradigm is more closely related to meeting this need (Murphy & O'Connell 2013; Van Zijl & Maroun 2024). Both of these paradigms influence the setting of accounting standards as well as the choice of accounting method and policy differently. Regardless of which paradigm is focused on, the agency theory has a profound effect on accounting and can be applied to goodwill accounting (Murphy & O'Connell 2013).

Agency theory addresses the importance of accounting for goodwill as a means of minimising agency costs. The recognition of goodwill at the acquisition of a business combination illustrates synergistic benefits which management paid for. Consequently, management must be held accountable for either realising this value or squandering it. To do this, goodwill must be kept as an asset and reduced only where there is evidence of its consumption or impairment and in the period of that consumption or impairment. Most accountants agree the useful life of goodwill cannot be reliably estimated, making the recognition of goodwill's consumption impractical

(Boennen & Glaum 2014; Huikku, Mouritsen & Silvola 2017; Li & Sloan 2017; Wines, Dagwell & Windsor 2007). Amortisation is disputed on this basis. Goodwill can be tested for impairment and by testing for impairment annually, this should, theoretically, identify and record any decreases in value in the year in which the decrease arises. Whether the decrease is because of an initial overestimate of the synergies by management, or the realisation of those synergies overtime, cannot be differentiated. But the latter still ensures users can hold management accountable for their acquisitions and the subsequent management thereof (Linsmeier & Wheeler 2021; Wines et al. 2007).

Some accountants and users argue that, despite the inability to estimate goodwill's useful life, it should nevertheless be amortised over a reasonable period for one of two reasons. Firstly, the impairment test cannot differentiate between the original goodwill and new internally generated goodwill that is a 'replacement' of the consumption or impairment of the original goodwill balance. Secondly, when impairments are recognised, they are recognised too late to provide useful information and so the impairment model is expensive without sufficient benefits to warrant the approach (Duangploy et al. 2005; Ferramosca & Allegrini 2021; Linsmeier & Wheeler 2021). This is because managers are incentivised to use any discretionary options available to them to manipulate the business for their own private gains (Choi & Nam 2020; Filip et al. 2021). Goodwill impairment is a very effective tool to achieve this because the judgements required to test for impairment are so subjective and difficult to dispute objectively (Ramanna & Watts 2012). Moreover, because users have become sceptical of goodwill, goodwill may be disregarded to avoid the issue altogether. If this is the case, goodwill might as well be amortised over a reasonable period (Lev 2018b).

The history of goodwill accounting under the International Accounting Standards Committee

The first set of standards which outlined the concept and accounting for goodwill from business acquisitions were issued by the Accounting Principles Board (APB) in 1970 as APB 17 and the IASC in 1983 as IAS 22: *Accounting for Business Combinations*. Entities could *choose* to either use the pooling of interests method for mergers of equal entities or the purchase method that could result in goodwill. Goodwill could either be written off immediately to equity or capitalised and subsequently amortised (Dunne & Rollins 1992). Most jurisdictions capitalised goodwill (Amel-Zadeh, Glaum & Sellhorn 2021) and wrote it off over 20 (IASC) or 40 (APB) years (AICPA 1970).

The choice in the method of accounting for goodwill led to the pooling method often being utilised for many different types of business combinations while it was only supposed to be adopted for combinations or mergers of equal entities. Organisations would use this method under specific circumstances related to business combinations that met certain criteria such as, for example, the condition that the business combination was achieved without the transfer of consideration between the companies involved (Massoud & Raiborn 2003). The pooling method allowed the combining entities to consolidate their financial statements as if they had always been a single entity and avoided recognising assets and liabilities at their fair values meaning that no goodwill is recognised. This results in potentially smoother financial reporting and fewer adjustments to historical financial statements. This adversely impacts comparability, transparency and the faithful representation of the economic substance of business combinations (Massoud & Raiborn 2003). This catalysed the deliberation to consider the elimination of this method completely (Amel-Zadeh et al. 2021). In 1993, the standard was revised by the IASC as part of the 'Comparability of Financial Statements' project and again in October 1998. International Accounting Standard 22 was subsequently adopted by the IASB in 2001 (Deloitte 2022; IASB 2021). Accounting Principles Board 17 was similarly replaced by the issue of SFAS 141 and 142 by the FASB in 2001 (Amel-Zadeh et al. 2021).

International Accounting Standard 22 stipulates that goodwill recognised as an asset should be amortised on a straight-line basis over its useful life. This useful life was limited to 20 years unless it could be proven that the goodwill would reasonably provide benefits over a longer period. In addition to this amortisation, goodwill was also subject to impairment as required by IAS 36. If the useful life of goodwill was determined to be greater than 20 years, the asset would have to be tested for impairment annually (Deloitte 2022).

The history of goodwill under the International Accounting Standards Board

In 2001, the IASB adopted the IASC's standards (Zeff 2012). The IASB decided to consider the revision of IAS 22 in an effort towards the improvement of the quality in accounting for business combinations. The project was to take place over two phases.

Phase 1

On 05 December 2002, the IASB published an Exposure Draft (ED 3) which included the proposal to replace IAS 22 with IFRS 3. Exposure Draft 3 proposed three options for improving the accounting for goodwill:

1. Amortisation of goodwill with impairment tests whenever there is an indication of impairment (in line with IAS 22)
2. No amortisation of goodwill, only annual impairment testing
3. A choice between both options (one and two).

Comments received in response to ED 3 opposed option 3 as the comparability and reliability of financial statements would be compromised. After much deliberation, the IASB decided to adopt option 2. The IASB disclosed in their Basis for Conclusions (2004) that the reasons to forgo the previous method of accounting included the argument that the decline

of goodwill is not always predictable and, therefore, the pattern of amortisation is inappropriate as it does not provide useful information. Furthermore, the prediction of useful life for goodwill is unreliable to the detriment of the usefulness of the information. The decision to adopt an impairment-only approach is also in line with the accounting of intangible assets and is conceptually justified. Impairment, like amortisation of goodwill, ensures the write-down of goodwill and the same outcome as with IAS 22 is reached, despite the change in subsequent accounting for goodwill.

Another change made was the recognition and presentation of 'negative goodwill', in other words, a bargain purchase gain. It was proposed that it would no longer be recognised as a decrease in assets, but rather directly in the statement of profit and loss. Following the collaboration and debate, the first stage of the project was concluded in March 2004, and IFRS 3 was issued (IASB 2021; Johansson, Hjelström & Hellman 2016).

Phase 2

The second ED was published in June 2005. The changes made with regard to goodwill further clarified that intangible assets that meet the definition as per IAS 38 and are identifiable (separable or arise from contractual rights) can be recognised separately from goodwill. This is in contrast to the 2004's IFRS 3 which only allowed for the intangible asset to be recognised separately if they met the definition per IAS 38 *and* could be reliably measured. These amendments were implemented in January 2008. Minor changes were made to IFRS 3 in 2013, 2017, 2018 and 2020 but the alterations have not resulted in drastic implications on the accounting for goodwill (IASB 2021).

Research on goodwill's implementation

Following the replacement of goodwill amortisation with goodwill impairment, research found that goodwill amortisation did not enhance the usefulness of earnings data and the new impairment-only approach potentially provided more useful information to users (Jennings et al. 2001). The shift in approach also led to higher profits being reported by entities.

IFRS 1 required all prior goodwill amortisations be reversed for first time adopters who elect to retrospectively adopt IFRS 3 (Hamberg, Paananen & Novak 2011). The IASB recognised that the cost of recalculating goodwill may outweigh the benefits and provided alternative methods for first-time IFRS adopters. When recognising past business combinations, the IASB established that goodwill and intangible assets are closely related and it would only be necessary to restate goodwill under two circumstances. Goodwill would need to be restated when items which were classified as intangible assets under Generally Accepted Accounting Principles (GAAP) were no longer classified as such under IFRS. Goodwill would also need to be restated when an intangible asset was included as part of goodwill under GAAP. To prevent double counting for intangible assets as part of goodwill, all first-time adopters are required to test goodwill for impairment (IFRS 2008).

Goodwill impairment encounters several difficulties in its accounting as the asset itself is not separable and differentiable but relates to future earnings (Huikku et al. 2017). A study of US firms from 2003 to 2011 found that entities that prevented or limited the recognition of impairment losses had much higher discretionary cash flows (Filip et al. 2015). Companies which are audited by the Big 4 tend to provide more timely impairments, but their timeliness worsens as auditor tenure increases or more non-audit services are provided to the company (Albersmann & Quick 2020). Market reactions to goodwill impairments are worse where there is greater managerial discretion and where the country has lower levels of legal protection (Knauer & Wöhrmann 2016). These reactions may negatively impact company share prices (Li et al. 2005).

During the post-implementation period of IFRS 3, many concerns regarding accounting for goodwill came to light. Feedback from professionals indicated that the impairment of goodwill is not sufficient to allow users to assess acquisition success timeously. Feedback provided reiterated the repetitive concerns already well known, such as the complexity and time required to perform impairment calculations as well as how timely impairment recognition is (IFRS & FASB 2022).

The post-implementation review led to an investigation into improving the effectiveness of impairment tests in recognising losses on a timely basis. The re-introduction of amortisation along with impairment testing was prioritised over the other topics and included as part of the agenda item (IFRS 2023). The preliminary view in the Discussion Paper was to retain an impairment-only approach despite many stakeholders advocating for goodwill amortisation. Users' views remain mixed where some believe goodwill is a wasting asset while others believe that it has an indefinite useful life that reduces primarily because of specific events or situations (IFRS 2023). Ultimately, reconciliation between the two views may be unlikely because goodwill is specific to each case where it may sometimes be a wasting asset and other times have an indefinite life (IFRS 2023).

The decision by the IASB to follow the FASB in replacing the amortisation model with an impairment-only approach was made in an attempt to increase the comparability of financial statements among differing jurisdictions and better improve the transparency of accounting for business combinations. This decision may have been premature and made solely to ensure convergence, without fully considering the usefulness of information portrayed by the impairment-only model. Goodwill impairment allows for managerial discretion which can lead to delays in the recognition of the loss which impacts its usefulness. Following the adoption by the IASB, Japanese standard setters expressed their view that the IASB was hasty in their decision to follow the United States (US) and should have performed due diligence and acted with caution to

ensure the validity of the impairment-only approach. Japan remains the only jurisdiction where entities can still adopt the amortisation model for subsequent accounting of goodwill as a result of the choice of accounting standard implementation and Japanese accounting standards retaining the amortisation approach of goodwill (Kobori 2020).

Since September 2021, the IASB in collaboration with the FASB appealed for increased feedback on the reintroduction of goodwill amortisation. Specific reference was made to the possibility of accurately determining the useful life of goodwill because this was one reason amortisations were excluded from the standard originally (IFRS & FASB 2022). Following the Discussion Paper, a decision was made not to focus on the re-implementation of goodwill amortisation but rather to assess whether the evidence suggests that, since the issue of IFRS 3, there is a need for change. As part of the consideration, the first objective explored requiring enhanced information about business combinations and expected synergistic benefits.

The second objective focused on reducing the costs associated with impairment testing. An amortisation and impairment model also generated mixed views but was tentatively also rejected in favour of the current impairment-only approach because there was not sufficient evidence to suggest a compelling case for change that would improve the relevance and faithful representation of goodwill (IFRS 2023). Ten out of eleven IASB members agreed with the decision, but some noted that they would have preferred the combined amortisation and impairment model. The project has been moved from the research to the standard-setting phase (IFRS 2023). It seems the focus will be on simplifying the impairment testing and providing enhanced disclosure regarding acquisitions and goodwill (IFRS 2023).

The debate over the methods warrants further academic research including an assessment of the trends in research with regards to jurisdictional analysis, methodologies, research paradigms and the focus of enquiry. In doing so, the research highlights potential biases that are impacting goodwill discussions and may prove useful in finding better methods to account for goodwill.

Quantum and location of research dealing with goodwill accounting

The quantum of research dealing with goodwill impairment, depreciation and amortisation has steadily increased since 1990 but has fluctuated at key milestones as illustrated in Figure 2.

During 2010, 2016 and 2021, there were large increases in research relating to goodwill accounting, specifically with regard to impairment, depreciation and amortisation. Much of the research published in 2010 discusses the opportunistic nature of goodwill impairment accounting and the need for more rigorous auditing and regulation to ensure compliance with IFRS (see Themes 3 and 5 of the section 'Thematic analysis of goodwill accounting'). The impairment-only approach is criticised as allowing too much managerial manipulation of intangible assets as reflected in the financial statements (see e.g. Carlin & Finch 2010; Lhaopadchan 2010; Petersen & Plenborg 2010).

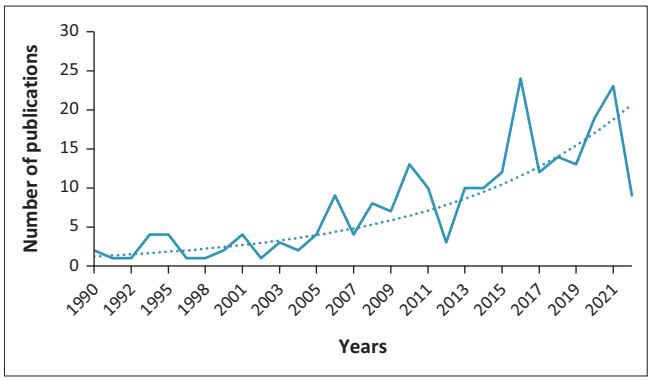


FIGURE 2: The number of publications over time.

The increased research on the ability to manipulate intangible asset valuations would be expected following the financial crash that took place between 2007 and 2009 which led to much consideration by accounting standard setters on their role of ensuring the standards encourage and advocate for greater transparency. The role of financial reporting by banks was established to have contributed less to the crisis which resulted in a subsequent decrease in research in 2012 (Barth & Landsman 2010).

The increase in 2016 follows the discussion and decision by the IASB to reconsider the accounting for the subsequent measurement of goodwill in September 2015. The focus of the research is on evaluating the market reactions to impairments, the decision-usefulness of impairment information and a critical analysis of the accounting standards (see e.g. Al-Hiyari, Latif & Amran 2016; Johansson et al. 2016; Knauer & Wöhrmann 2016; Schatt et al. 2016; Wen & Moehrle 2016). The decrease in research between 2017 and 2019 follows a decline in interest as the standards became more commonplace and institutionalised but then increased again as new exposure drafts and comments in 2020 began to emerge. The IASB received feedback on its goodwill Discussion Paper in March 2020 prompting more research evaluating how to account for goodwill as the debate over different methods grew (see e.g. Amel-Zadeh et al. 2021; Ferramosca & Allegrini 2021; Filip, Lobo & Paugam 2021; Linsmeier & Wheeler 2021; Marques, Maroun & Garnet 2020; Wang et al. 2021).

Figure 3 shows that the majority of publications on goodwill impairment, amortisation or depreciation emanate from the US (56) followed by multi-jurisdictional authored studies (40). On the one hand, the US represents a major global economy with its own standard setter, is ranked first globally in producing scientific publications, third in terms of financial systems and is in the top 20 countries globally for the strength of auditing and accounting standards (WEF 2019). These factors may explain their dominance. On the other

hand, the US is often associated with a preoccupation with neoclassical financial econometrics that has infiltrated accounting to the point that Ravenscroft and Williams (2009) argue 'accounting [*is*] a servant of the imaginary world of neoclassical economics' (p. 770). Ravenscroft and Williams (2009) conclude that the validity of the impairment-only approach is confirmed simply because it uses financial mathematics with the perception of being scientific and robust.

Much of the research published out of the US and Australia focus on whether the usefulness of goodwill accounting has improved or deteriorated following the adoption of an impairment-only approach (Boennen & Glaum 2014). Goodwill impairments are found to provide useful information in reflecting on the performance of investments (Xu, Anandarajan & Curatola 2011).

A number of publications reveal that goodwill impairments are viewed negatively by investors in the short term but these write-offs are found to be positive in the long term because of decreased non-recurring charges (Cheng, Peterson & Sherrill 2017). The impairment-only model is identified as more value relevant than the amortisation approach which is described as detracting from the usefulness of earnings (Jennings et al. 2001).

The majority of multi-jurisdiction authored publications are by individuals from developed countries (73%). Developed countries often have more developed markets where determining the fair value of cash-generating units may be easier and less costly in comparison to developing countries, especially with regard to non-financial assets (Lev 2018a; Negash, Lemma & Samkin 2019; Ramanna & Watts 2012; Van Zijl & Hewlett 2022). In addition, developed economies have more skilled valuation experts that may be more capable of performing these complex calculations accurately (Kok & Maroun 2021). That much of the research stems from developed countries may undermine arguments about the inherent complexity and subjectivity of goodwill impairment calculations being sufficient to warrant an amortisation method that may be less conceptually grounded.

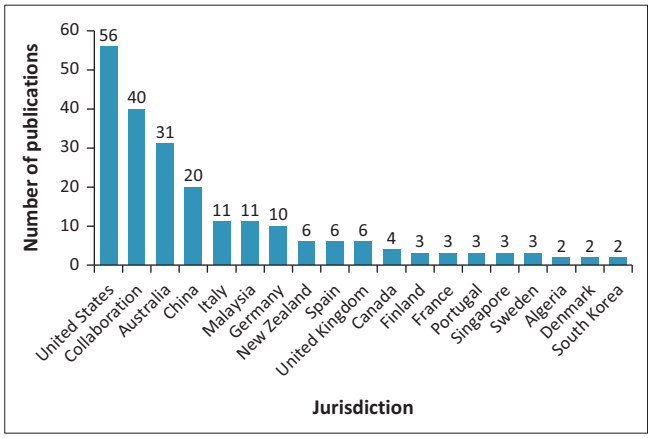


FIGURE 3: Number of publications per jurisdiction.

China published the fourth most studies. Publications in China focus on improving goodwill accounting within the impairment model and not simply on the re-introduction of goodwill amortisation. The suggestions and propositions include better governance, increased disclosure and simplifying the impairment approach (Wang et al. 2021). Consistent with other global studies, firms are pressurised by analysts to use managerial discretion to manage earnings and prefer delayed goodwill impairment over real earnings management (Han & Tang 2020; Wang et al. 2021). Despite China's different socio-political environment, they also experience the same concerns over delayed goodwill impairment recognition reaffirms how widespread delayed impairment recognition is globally.

The current IASB's agenda to simplify impairment tests (IFRS 2023) may assist developing nations in implementing goodwill impairment via reduced complexity, but whether that will result in more discretion to use goodwill impairments to manage earnings is yet to be answered. Insights from academics will be vital in providing feedback in this area.

More detailed and focused research may be required to identify the value relevance of the amortisation approach in accounting for goodwill. The adoption of the amortisation model in Japan can be analysed to provide objective analyses and interpretations to assist the IASB in making a decision on accounting for goodwill. This research can also extend to entities which adopt IFRS for Small and Medium-Sized Entities (SMEs). Research in this regard can contribute to the IASB's decision on the agenda item relating to goodwill accounting.

The research methods used, epistemology and focus of the research

Figure 4 and Figure 5 align with the heavy financial economics focus discussed earlier where positivist (77%) and quantitative (66%) methods are most frequent. No new methods for the subsequent treatment of non-current assets have been developed since depreciation and impairment first arose. Arguably, fair value is one alternate method but even it is over a century old and suffers from the same weaknesses associated with the impairment-only approach to goodwill

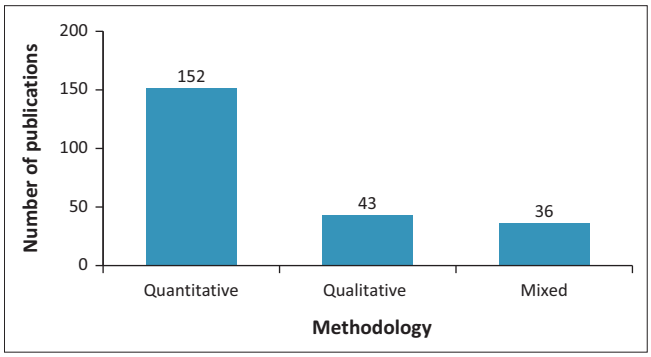


FIGURE 4: Research methodologies adopted.

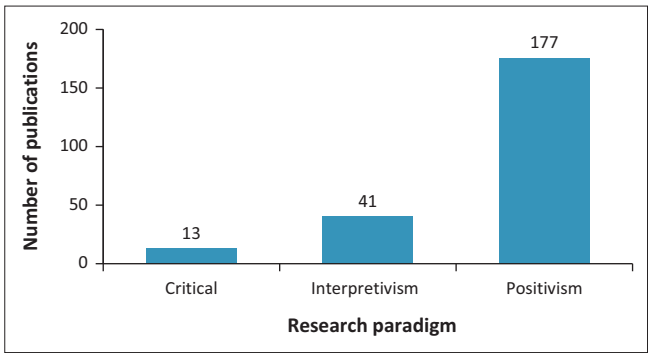


FIGURE 5: Epistemological paradigms.

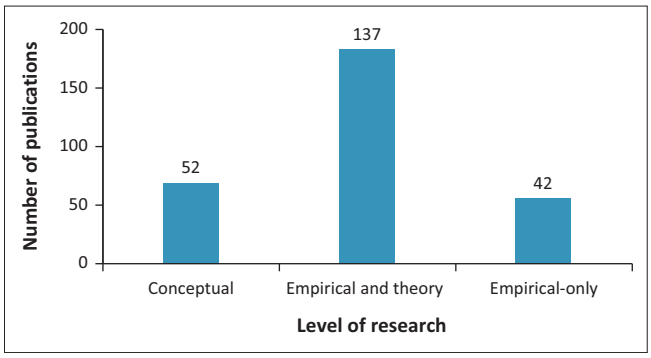


FIGURE 6: Focus of enquiry.

(see Walker 2006). The findings indicate it may be worth investing more time in qualitative studies that seek new, unique approaches to the subsequent treatment of non-current assets that align with modern business practices (see Johansson et al. 2016; Linsmeier & Wheeler 2021).

Research has also revealed a divide between standard setters and users of financial statements. Standard setters advocate for transparency and accountability but the chosen methods of accounting differ from this and stewardship principles. This is apparent in goodwill accounting where the impairment model was adopted which, in theory, advocates for transparency and accountability, but its implementation allows for a great amount of managerial discretion (Durocher & Georgiou, 2022). Standard setters face the challenge of developing accounting practices which promote both reliability and relevance. There is often a compromise between the two, particularly in relation to fair value valuations and goodwill is an example of this. The adoption of the impairment approach in accounting for goodwill provides more relevant information, but the reliability surrounding this is more difficult to ascertain (Bens, Heltzer & Segal 2011). Managerial discretion has the potential to allow for more reliable information by reducing the bias associated with an amortisation approach, but this is under the assumption that managers do not withhold information and their interests align with those of the shareholders (Escaffre & Sefsaf 2010).

A popular topic for positivist studies is the link between earnings management and goodwill. Goodwill impairment has been associated with a decrease in share price and market reaction (Escaffre & Sefsaf 2010, Knauer & Wöhrmann 2016). This incentivises management to delay impairments in preventing this from occurring which is a potential flaw in current goodwill accounting practices. The managerial discretion associated with the valuation of the impairment loss allows for earnings management to become a cause for concern in relation to goodwill and the IASB should consider how to overcome this (Knauer & Wöhrmann 2016). The amortisation approach has not been without criticism, but its simple calculation and limited judgement or management involvement have made it an appealing option.

Figure 6 reflects that the majority (59%) of publications contain a mix of empirical research with some level of theory to support its findings. These studies apply theoretical concepts to a number of jurisdictions or topics as part of a case study. The research often identifies areas for further study and encourages standard setters to consider institutional contexts when making decisions regarding goodwill accounting (Schatt et al. 2016). They also help to consolidate empirical-only studies to identify theoretical issues within goodwill accounting practices in finding solutions to problems (Filip et al. 2021).

Empirical-only studies (18%) apply goodwill accounting to single jurisdiction case studies or topics. The impairment of goodwill and its impact on the equity value of the entity was researched to establish whether goodwill impairment is relevant. These studies contribute by looking at issues in a practical setting (Shahwan & Roudaki 2016). For example, research performed with a focus on German-listed firms confirmed that goodwill impairments are not recognised in a timely manner by management owing to their discretion. This contributes to identifying trends within jurisdictions which can prompt similar research in other jurisdictions (Albersmann & Quick 2020). Another study found that new CEOs are associated with large goodwill impairments (Al-Hiyari et al. 2016).

Theory and conceptual-only research (23%) includes theoretical studies which look at accounting standards and critically evaluate and examine the accounting of goodwill (Li & Sloan 2017). This research also considers the movements from the previous amortisation-only approach to an impairment-only approach (Chen, Kohlbeck & Warfield 2008). This research is important in identifying theoretical issues relating to goodwill accounting which can then be examined and considered by standard setters as well as allow for future researchers to test the theories.

Techniques to measure goodwill impairment losses have become more sophisticated by leveraging cash flow analyses, market-based approaches and quantitative risk assessments, which provide more accurate and timely impairment decisions (Martínez et al. 2023; Seetharaman et al. 2004). Advanced measurement methodologies better reflect the current economic landscape and allow for more informed strategic decisions for organisations. Measurement techniques are supported by advancements in data analytics and artificial intelligence, which streamline the process, provide timely

information, include predictive considerations, support a more holistic assessment and enhance the efficiency of the financial reporting process (Kuzmina & Kozlovska 2012; Taipaleenmäki & Ikäheimo 2013). These innovations ultimately benefit stakeholders by providing more transparent and reliable financial reporting. Put differently, an integrated thinking logic is being applied not only to non-financial considerations such as human and natural capital but also to financial capital considerations (Ecim 2024; Herath, Senaratne & Gunarathne 2021). How this integrated approach is applied to financial reporting considerations specifically has yet to be explored in depth. Similarly, research that practically addresses innovations in measurement bases in a current and multi-jurisdictional setting is not prevalent. Research often lacks the direct assessment of the interconnections and interdependencies of various accounting standards, laws and regulations and organisation-specific requirements that contribute to the decision-making process of both the organisation and stakeholders regarding impairment assessments.

Conclusion and areas for future research

This article contributes to the growing insights on goodwill accounting by providing a content analysis of what research has been performed and areas for future research. It has also allowed for the categorisation of research studies published within the Scopus database and drawn on these publications to contribute to standard-setters understanding of trends in research and areas which require attention.

This research identifies the dominance of positivist quantitative research and financial economics as a key issue that may be holding back progress on the subsequent treatment of goodwill (and other intangible assets). The prior research overwhelmingly reiterates and repeats the same three issues, namely: (1) that the impairment-only approach allows too much managerial discretion, (2) an inability to reasonably estimate the useful life of goodwill deters many from supporting goodwill amortisation and that (3) sometimes goodwill may be a wasting asset while others may genuinely have an indefinite useful life. In addition, developing countries may be at a greater disadvantage in comparison to developed economies in terms of sufficiently developed markets and availability of data and expertise to adequately perform goodwill impairment calculations (see also Hopper, Lassou & Soobaroyen 2017; Van Zijl & Hewlett 2022).

Little progress has been made to overcome the dated issues related to goodwill impairment and are likely to continue unless a genuinely fresh method is discovered. This article suggests pure grounded theory research is required to develop a novel perspective on goodwill accounting (see Charmaz & Belgrave 2007) using a ground-up approach. This endeavour will take time but is expected to result in advancements not only for goodwill and other indefinite useful life intangible assets but more generally too. It may also hold the key to creating a truly comprehensive corporate report that does not ignore most non-financial aspects of a company's impact and performance. Cross-disciplinary research drawing on ecology, anthropology and other disciplines may provide the key to emancipate accounting (Atkins & Maroun 2018; Hassan, Roberts & Atkins 2020; Maroun & Atkins 2018). This is a radical proposal, but one that is now more important than ever to pursue.

As a start, qualitative research aimed at understanding how to balance increased business combination (and goodwill) disclosure with boilerplate or generic and unhelpful disclosure is required. This is because this is easiest for the IASB to implement in the short-term and is being considered by the IASB's current project. Such research can focus on the types of information (both qualitative and quantitative) that would be useful as well as how to ensure its credibility and relevance to financial statement users. In particular, critical researchers may even wish to reevaluate the concept of goodwill as a catch-all for 'unidentifiable assets' acquired in business combinations. Perhaps with all the technological advances and Big Data, more can be separately identified and measured to reduce the significance of goodwill. Goodwill can be sub-categorised into different components, some of which are more easily measurable to ensure timely recognition of changes in value. Another possibility may be that the continued divergence between a company's book and market value can be addressed while researchers reimagine business combination and goodwill accounting (see Lev 2018a, 2018b).

Lev (2018a) suggests that the increasing divergence between a company's book and market value is a cause for concern. Researchers are encouraged to consider whether reimagining goodwill accounting can also propose solutions to these types of criticism. Researchers are encouraged to dare to suggest what many in our community may deem radical in order to bring us closer to a solution. The rise in entities adopting a sustainability and integrated thinking logic in their financial reporting (see Maroun, Ecim & Cerbone 2023; Myeza et al. 2023) may also impact goodwill recognition and subsequent measurement. This iterates the need for increased innovation to be incorporated into the evolution of financial reporting, which includes, for example, an integrated approach to managing financial and non-financial capitals; adopting sophisticated management control systems to collect, analyse and use data related to impairment and goodwill; using advanced technologies and artificial intelligence to support decision-making and incorporating goodwill considerations into strategy, risk assessments and operational decisions.

Goodwill may already incorporate non-financial factors but there has been little research performed in this regard. There is scope for future research relating to goodwill and the level of integrated thinking measured by a merger and acquisition, particularly in light of the formation of the International Sustainability Standards Board (ISSB) and the introduction of the sustainability standards which could help to quantify

synergistic benefits. Subsequently, the decline in this sustainability performance and the link to how this impacts goodwill will need to be assessed further.

Notes:

1. IFRS 3 – Business Combinations
2. IAS 22 – Business Combinations (superseded)
3. There has also been significant commentary received on the benefits and challenges of different accounting approaches to goodwill measurement (IFRS 2023).
4. A list of the articles used in the manuscript is available on request.
5. Irrelevant publications relate to those which discuss goodwill accounting, amortisation, impairment, or depreciation not in terms of financial accounting.
6. Given that amortisation and depreciation have the same meaning in a professional sense, this was included to ensure that applicable publications were included in the scope of the search.
7. Both the American and United Kingdom spelling of amortisation were utilised to ensure all relevant publications from different jurisdictions are considered.
8. A higher-level split has been adopted for the content analysis as this will allow for more distinct categories and a more accurate content analysis to be performed to limit subjectivity.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

H.J. was responsible for the data collection, formal analysis, investigation and writing the first draft of the article. D.E. was responsible for the implementation of the methodology, supervision and writing the second draft of the article. W.v.Z. was responsible for the project conceptualisation, supervision and review of the article.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of the Witwatersrand, Johannesburg, Human Research Ethics committee (reference no.: WSOA-2023-01-01W).

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Data availability

The data that support the findings of this study are available from the corresponding author, D.E., upon reasonable request.

Disclaimer

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