

Accounting for goodwill: A literature review**Araceli Amorós Martínez^{a*}, José Antonio Caveró Rubio^a and Mónica Gonzáles Morales^a**^aUniversity of Miguel Hernández, Spain**CHRONICLE***Article history:*

Received June 30, 2022

Received in revised format July 28 2022

Accepted September 15 2022

Available online

September, 15 2022

*Keywords:**Goodwill**Impairment test**Systematic amortisation**intangible assets**International accounting***ABSTRACT**

This paper critically reviews the main empirical research on goodwill accounting with the purpose of informing and contributing to current debates: the application of a systematic amortisation plus an impairment when required (amortisation model) or an annual impairment-only test (impairment model). Using the main databases (ABI inform, ProQuest Central, Emerald, Science Direct, Scopus and Google Scholar), this critical review highlights the difficulty to resolve doubts at this stage. Arguments for and against the amortisation and impairment models are found. Nevertheless, going back to a systematic amortisation does not seem to be the solution but the impairment test model is eliminated. We also note that there is more room for improvement of the impairment model. Thus, we provide some guidelines and recommendations to improve it. Finally, we find that further investigation can be carried out to fill the gaps identified in the literature and we make recommendations for future research projects.

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1. Introduction

Whether goodwill should be amortized or impaired has been a question to which an answer is still being sought. The debates continue to revolve around this question and the regulators do not seem to reach a satisfactory solution. After the international convergence signed by the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB), systematic goodwill amortisation plus an impairment when required (amortisation model) was substituted for the annual goodwill impairment-only test (impairment model). This change in the accounting for goodwill has been widely discussed by specialists worldwide, and the FASB and the IASB have recently re-opened their deliberations on this subject. Nevertheless, although they have asked for comments on goodwill accounting, the two traditional models coexist in the current Accounting standards.

Last August 2018, Hans Hoogervorst (the Chairman of the IASB) declared that “*a better awareness of the possible pitfalls of current accounting for goodwill would in itself be a positive development*”. A literature review offers the possibility of analysing the strengths and weaknesses of different accounting approaches for goodwill from different perspectives, creating a global and integral view of the issue. Given the state of the matter and the large number of studies carried out, we conduct an exhaustive review of the results presented in the literature that has been dedicated to this subject for decades with the purpose of gaining a better understanding of it.

Although several authors have provided literature reviews, some of them are limited entirely to aspects related to goodwill impairment approach (Amel-Zadeh, *et al.*, 2021; Boennen & Glaum, 2014; Carvalho, *et al.*, 2016a; D’Arcy & Tarca, 2018; Schatt, *et al.*, 2016), others are only developed within the scope of the International Financial Reporting Standards (IFRS) (ICAEW, 2015; Piombino & Tarca, 2014) or focus on a particular dimension of goodwill accounting investigation

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(Cañibano *et al.*, 2000; Wen & Moehrle, 2016). Unlike these reviews, this paper carries out a deeper, more exhaustive and updated review that tries to integrate different relevant dimensions of goodwill accounting regardless of accounting regime. Furthermore, the main purpose of this review is to analyse and compare the results of the studies regarding the two main models in which the regulating bodies are debated: the application of a systematic amortisation plus an impairment when required (amortisation model) or an annual impairment-only test (impairment model).

In particular, we follow a rigorous process based on a review that includes studies within the scope of both the IFRS and the Statement of Financial Accounting Standards (SFAS), and a wider range of countries. We encompass a high number of refereed papers from academic journals and we cover a longer period of revision that includes aspects related to the accounting treatment of goodwill to date. The review focuses on positive goodwill arising from an acquisition and the two main models that are the attention of current debates: amortisation and impairment models. In addition, it makes a critical analysis and discussion of the results and methodology designs. This allows us to make recommendations about goodwill accounting guidelines and support the development of future research projects. Hence, this study aims to inform the current debate about its subsequent recognition and valuation and to guide standard setters and regulators in future decisions. Likewise, this review is useful for preparers, researchers, professionals as well as all users of financial statements who need to get a better understanding of the different dimensions and consequences of the implementation of a particular accounting practice. It is also interesting for academics as it allows them to identify future research opportunities on certain aspects not analysed to date and to roll out new research designs.

The remainder of the paper is organised as follows: Section 2 presents the background of goodwill accounting; Section 3 describes the research methodology used for the review; Section 4 presents the results of the literature review related to the main goodwill accounting practices; and finally, Section 5 illustrates our discussions and concluding remarks.

2. Background: Goodwill Accounting

2.1 Prior Goodwill Accounting

Given that goodwill is strongly related to the accounting of business combinations, since it arises from these kinds of operations, their accounting has been considered simultaneously. Prior to the convergence period, the Accounting Principles Board (APB) 16 *Business Combinations* and 17 *Intangible Assets* issued in 1970 and the International Accounting Standards (IAS) 22 *Business Combinations* of 1983 tried to regularise these two areas of accounting. In these standards, two methods for recording business combinations were established: the pooling of interests method and the purchase method. In the first one, it was not mandatory to recognise goodwill, since it was associated with cooperation between two firms with common interests. However, in the second one, it was considered that an imposition existed from one company (the acquirer) over the other (the acquiree) and goodwill arose because of the excess of the price paid by the acquirer over the fair value of the net identifiable assets acquired. Therefore, goodwill could only be recognised when it had arisen as a consequence of the acquisition of a business and its initial value was determined residually. In these cases, the policies and practices applicable to goodwill were very diverse.

The most prominent accounting treatments of goodwill were its immediate cancellation against reserves or its capitalisation and subsequent systematic amortisation plus an impairment when required. The first treatment stemmed from the idea that goodwill belongs to shareholders and is therefore part of equity (see Chambers, 1966, p. 211). Nevertheless, the IAS 22 does not consider this possibility, while APB 17 argues that deducting the cost of an asset against reserves prevents the correlation between income and expenses. Conversely, in the EU, following the approval of the Seventh Directive 83/349/EEC in 1983, firms in the United Kingdom (UK) popularly adopted this behaviour. They treated it like an advance payment by shareholders who anticipated greater future earnings. However, the application of this approach meant that the information generated differed significantly from other firms that did not apply it (Alexander & Archer, 1996; Choi & Lee, 1991; Grinyer, *et al.*, 1991; Lee & Choi, 1992).

In the second treatment, the amortisation period was also diverse, ranging from a maximum of 20 years, as in the case of the majority of EU countries, to 40 years, as in the case of the US. In these cases, additional amortisation under the purchase method usually generated lower earnings than those reported under the pooling of interests method (Giner & Pardo, 2004). Consequently, there was an abusive choice of the pooling of interests method for the recognition of business combinations (Choi & Lee, 1991; Johnson & Petrone, 1998; Lee & Choi, 1992).

This whole situation coincided with a time when there was a growing complexity and internationalisation of business relations, which increased the importance of goodwill in balance sheets and the need to facilitate greater comparability of financial information (IMAA, 2015; Wen & Moehrle, 2016). Under these circumstances, the main international standard setters initiated a convergence process in order to establish a common accounting regulation adapted to the new needs for higher quality information. As a result of this initiative, in 2001, the APB 16 and APB 17 were superseded by the SFAS 141 *Business Combinations* and 142 *Goodwill and Other Intangible Assets*. Later, in 2004, the IAS 22 was superseded by the IFRS 3 *Business Combinations* and the IAS 36 *Impairment of Assets* and 38 *Intangible Assets* (hereinafter, IFRS). They eliminated the pooling of interests method and the amortisation model was substituted by the recognition of an annual impairment test or in a shorter period if the circumstances so required (impairment model). Although the amortisation model is simpler to implement, it was abolished due to its arbitrary estimation of useful life and the lack of relevance and timeliness for users of financial information (FASB, 2001; IASB, 2004c).

However, accounting convergence seems to be breaking down. Criticisms towards the impairment model have not stopped, even questioning the reasons why this decision was made. In previous research, it has been pointed out that that decision responded to the political pressure exerted by US firms in favour of the pooling of interests method. They saw its abolition as a threat to their accounts and they only accepted prohibition of this method if goodwill would no longer be amortised (Ramanna, 2008). Consequently, the FASB decided to adopt the impairment test and subsequently the IASB followed their steps to achieve convergence and because it would be difficult to maintain an accounting model which could lead to higher goodwill expenses and lower profits.

Other criticisms point to the costly and complex procedures involved in the impairment test, which generate a certain subjectivity and discretion in decision making (AbuGhazaleh, *et al.*, 2011; Beatty & Weber, 2006). Furthermore, criticism has been made regarding the lack of timeliness and information provided (Camodeca, *et al.*, 2013; Carvalho, *et al.*, 2016b; Hamberg & Beisland, 2014; Li, *et al.*, 2011), which also contributes to making it hard to verify and audit (Ramanna & Watts, 2012). Conceptually, the goodwill impairment test gives managers more room for discretion than amortising it over a certain number of years (Boennen & Glaum, 2014). Nevertheless, if the impairment test is properly implemented, this discretion allows managers to signal private information and thereby improve the usefulness of accounting information for efficient decision making. Hence, standard setters are faced with the decision of moving towards more relevant as well as more reliable financial statements.

2.1 Current Goodwill Accounting

In recent years, after the feedback received from firms, investors and other users, there has been a reintroduction of the amortisation model (FASB, 2017; IASB, 2009). Regular amortisation of goodwill is understood to be a good solution to prevent accounting arbitrage and to mitigate the cost of the implementation of a goodwill impairment test for certain firms with fewer resources. However, this action has not been implemented for all types of firms nor uniquely in the different accounting standards, which jeopardises the accounting regulators' unification aims.

At an international level, the first step towards the reintroduction of amortisation was made by the IASB through the IFRS for Small and Medium-sized entities (SMEs) in 2009. It allowed SMEs alone to apply systematic amortisation to palliate the cost that applying an impairment test would involve (IASB, 2009). In the same line, the FASB modified the SFAS, now encoded as Accounting Standards Codification (ASC) 805 and ASC 350, and since 2018, US private firms have been able to apply amortisation or continue under the impairment model (FASB, 2014). This generalised change is also visible in the EU through the Directive 2013/34/EU, which forced all member States to reintroduce amortisation in their regulations. In general, in these latest modifications, goodwill is being reconsidered as an identifiable useful life asset, which must be amortised over its useful life, with the limited to a maximum of 10 years when that useful life is not defined. However, the introduction of these recent accounting standards where both models coexist generates a mixed accounting regulation, which, in accordance with Callao *et al.* (2007), Amorós and Caveró (2018) and Caveró *et al.* (2021), can jeopardise the comparability of accounting data and does not resolve the drawbacks previously found in each of the two models.

Currently, subsequent accounting for goodwill is still on the agenda of the regulating bodies. The IASB also considered whether to reintroduce amortisation of goodwill. However, the IASB's preliminary view is that it should retain the existing approach, which relies only on an impairment test of businesses containing goodwill and does not amortise goodwill. The IASB believes that its preliminary views would, if implemented, provide the best way to hold a company's management to account for its acquisition decisions. The IASB is now using the *Discussion Paper Business Combinations-Disclosures, Goodwill and Impairment*, published in March 2020 (DP 2020/1), to seek feedback on its preliminary views (IASB, 2021). In the EU context, the European Financial Reporting Advisory Group (EFRAG), a private association responsible for advising the European Commission, joined these actions. In 2017, they presented a discussion paper to explore possible ways of improving the goodwill impairment test and to help the IASB in its future regulatory decisions. In the 22 letters received, many members expressed the view that the goodwill impairment test could be improved in certain areas, but no decision was taken (EFRAG, 2018). Recently, in response to the IASB's DP 2020/1, the EFRAG has published its final comment letter and suggests the IASB further explore improvements to existing impairment test and any cost and consequences of reintroducing amortisation (EFRAG, 2021). For their part, the FASB has made amendments to improve the goodwill impairment test. They introduced step 0 – a first qualitative assessment to determine whether an impairment test is required (FASB, 2011) – and they eliminated step 2 from goodwill impairment (FASB, 2017). Nevertheless, the FASB has an active project where the subsequent accounting for goodwill is revisited broadly for all entities and where again the amortisation and the impairment models are discussed, reconsidering to implement the amortisation model for public companies (FASB, 2021). Definitely, the controversial nature of the question of whether applying the impairment model or the amortisation model is still on the actual debates.

3. Methodology

This paper provides a rigorous review of the relevant academic literature of goodwill accounting. Firstly, we carried out an exhaustive search of the studies about goodwill in different databases up until 2021. They include: ABI inform, ProQuest Central, Emerald, Science Direct, Scopus and Google Scholar. The computer search was made for papers containing the following keywords entered in the search engines of the abovementioned databases: goodwill, amortisation, write-downs, impairment, intangible assets, business combinations, acquisitions combined with an < OR > syntax. Secondly, we

eliminated theoretical papers and those based on anecdotal evidence or case studies. Thirdly, we assessed the quality of the studies, including only refereed papers from academic journals of recognised prestige (indexed journals in the listings provided by the Journal Citation Reports and Scopus). Finally, in order to complete the bibliographic analysis, we also reviewed the list of references given in seminal papers. This was done to also include other studies that have received recognition and relevance in academic literature, based on the subject matter and number of citations reached. This bibliographic search resulted in a total of 136 studies that have been classified into six research lines.

Contrast of the application of different goodwill accounting practices	Relevance and timeliness of goodwill numbers	Ability of goodwill numbers to make predictions	Determinant of goodwill impairment	Disclosure in the notes about goodwill and goodwill impairment test	Goodwill initial recognition and purchase price allocation	Other studies regarding goodwill practices and preferences
<ul style="list-style-type: none"> Colley and Volkan (1988) Emmynoum and Gray (1992) Lee and Choi (1992) Wines and Ferguson (1993) Archeil et al. (1995) Alexander and Archer (1996) Gabis et al. (1999) Larrin et al. (2000) Giner and Pardo (2004) Navarro (2004) Caliso et al. (2007) Hung and Subramanyam (2007) Chalmers et al. (2011) Audifé et al. (2016) Li and Sloan (2017) Cheng et al. (2018) Hong et al. (2018) Cavero et al. (2021) Johnson et al. (2021) 	<ul style="list-style-type: none"> McCarthy and Schneider (1995) Jennings et al. (1996) Henning et al. (2000) Jennings et al. (2001) Moshrie et al. (2001) Hirschey and Richardson (2002) Cheryk and Cheung (2003) Bugeja and Gallary (2006) Giner and Pardo (2007) Lapointe-Antunes et al. (2009) Horton and Serafeim (2010) Oliveira et al. (2010) Beni et al. (2011) Li et al. (2011) Sabat et al. (2011) Van Hultzen et al. (2011) Xu et al. (2011) AbuGhazaleh et al. (2012) Leghi et al. (2013) Baboukardos and Rimmel (2014) Hamberg and Beisland (2014) Ji and Lu (2014) Eloff and Villiers (2015) Al-Hiyari and Latif (2016) Knauser and Wolfrum (2016) Shahwan and Roudaki (2016) Bepari and Mellik (2017) Cheng et al. (2017) Alshelabi et al. (2021) Burger and Wen (2021) 	<ul style="list-style-type: none"> Jarva (2009) Lee (2011) Jennings et al. (2012) Jarva and Laatto (2012) Lee and Yoon (2012) Jarva (2014) Chan et al. (2015) Al-Hiyari et al. (2016a) Bostwick et al. (2016) Mason (2017) Yehuda et al. (2017) Ansróe and Cavero (2018) Xue and Xu (2021) 	<ul style="list-style-type: none"> Zucca and Campbell (1992) Francis et al. (1996) Rees et al. (1996) Beatty and Weber (2006) Hayn and Hughes (2006) Masters-Stout et al. (2008) Zang (2008) Godfrey and Koh (2009) Verriest and Gieremynck (2009) Carlin and Finch (2010) AbuGhazaleh et al. (2011) Gu and Ley (2011) Hamberg et al. (2011) Detzen and Zühd (2012) Ramanna and Watts (2012) Swanson et al. (2013) Isaiah and Seuffelner (2014) Abdul (2015) Avallone and Quagli (2015) Filip et al. (2015) Giner and Pardo (2015) Al-Hiyari et al. (2016b) Banker et al. (2016) Kabir and Rahman (2016) Korosec et al. (2016) Saastamoinen and Pajunen (2016) Sapkautkiene et al. (2016) Sun (2016) Vogt et al. (2016) Abdul (2017) Ferramosca et al. (2017) Kim and Bay (2017) Chen et al. (2018) Ghanm et al. (2018) Gres and Koch (2019) 	<ul style="list-style-type: none"> Sevin et al. (2007) Shalev (2009) Carlin and Finch (2011) Biancone (2012) Camodeca et al. (2013) D'Astous (2013) Ghanm et al. (2013) Guthrie and Pang (2013) Izzo et al. (2013) Khairi et al. (2013) Bepari et al. (2014) Gu and Ley (2014) Marino (2015) Carvalho et al. (2016b) Mazzi et al. (2017) Mazzi et al. (2018) Chen et al. (2019) Kabir et al. (2020) 	<ul style="list-style-type: none"> Grayer et al. (1991) Gore et al. (2000) Bloom (2009) Comiskey et al. (2010) Giuliani and Brinström (2011) King et al. (2013) Shalev et al. (2013) Zhang (2013) Bugeja and Loyeung (2015) Pagan et al. (2015) Su and Wells (2015) Xiao and Lin (2016) Zhang and Zhang (2017) Frii and Hamberg (2021) 	<ul style="list-style-type: none"> Carlin and Finch (2009) Petersen and Plenborg (2010) Ji (2013) Pajunen and Saastamoinen (2013) Viviantha (2017) Ferramosca and Allegrini (2021)

Fig. 1. Classification of empirical studies

The delimitation of the different research lines has been carried out according to the main objective of the study and following other classifications made by Amel-Zadeh *et al.* (2021), Schatt *et al.* (2016), Wen and Moehrl (2016), Piombino and Tarca (2014) and Carvalho *et al.* (2016a). When studies consider goodwill and other accounting items, only the results related to goodwill accounting are discussed and classified in line with the topic analysed. Fig. 1 shows an overview of the studies classified in the different lines identified: the contrast different goodwill accounting practices (19 studies), the value relevance and timeliness of goodwill (30 studies), the ability of goodwill numbers to make predictions (13 studies), the determinants of goodwill impairments (35 studies), the disclosures in the notes about goodwill and the goodwill impairment test (19 studies), goodwill initial recognition and purchase price allocation (14 studies) and other relevant studies regarding goodwill accounting practices and preferences (6 studies). As space limitations do not allow us to present a detailed discussion of all the studies in this review, we highlight the characteristics and results of those studies that are most relevant to respond to our main research objective: to compare the amortisation and impairment models of goodwill. Nevertheless, in the appendix we present the tabulated summaries of each study (research objective, sample, period, variables analysed, main analysis and major findings) grouped into lines of research. Additionally, Table 1 provides the main results of the collected studies classified by research lines and contexts.

Table 1

Result of empirical studies.

Research lines	Number of studies (Column A)	Context (Column B)			Results ^a (Column C)				
		EU	US	Other	Amortisation		Impairment		
					PA	NA	PI	NI	Other
1. Contrast of the application of different goodwill accounting practices.	19 13.97%	10 52.63%	6 31.58%	3 15.79%			3 15.79%	1 5.26%	15 78.95%
2. Relevance and timeliness of goodwill numbers	30 22.06%	9 30.00%	12 40.00%	9 30.00%	3 10.00%	3 10.00%	11 36.67%	2 6.67%	11 36.67%
3. Ability of goodwill numbers to make predictions.	13 9.56%	2 15.38%	7 53.85%	4 30.77%			8 61.54%	2 15.38%	3 23.08%
4. Determinants of goodwill impairment.	35 25.74%	10 28.57%	16 45.71%	9 25.71%				2 62.86%	13 37.14%
5. Disclosures in the notes about goodwill and goodwill impairment test.	19 13.97%	9 47.37%	3 15.79%	7 36.84%			1 5.26%	13 68.42%	5 26.32%
6. Goodwill initial recognition and purchase price allocation	14 10.29%	4 28.57%	4 28.57%	6 42.86%				2 14.29%	12 85.71%
7. Other studies regarding goodwill practices and preferences	6 4.41%	2 33.33%	1 16.67%	3 50.00%			1 16.67%	1 16.67%	4 66.67%
Total	136 100.00%	46 33.82%	49 36.03%	41 30.15%	3 2.21%	3 2.21%	24 17.65%	43 31.62%	63 46.32%

^aWhere: PA = positive attribute towards systematic amortisation; NA = negative attribute towards systematic amortisation; PI = positive attribute towards impairment test; NI = negative attribute towards impairment test.

Even though Table 1 (Column A) shows a great diversity in the issues analysed, most of the studies focus on the impairment test. In addition, a considerable proportion of them are oriented towards the determinants and the discretion inherent in the impairment test of goodwill impairment (25.74%, line 4). Another frequently analysed issue corresponds to the studies that focus on the capital market (22.06%, line 2) and the most analysed issue in this line of research is the value relevance and timing of goodwill and its impairment compared to its amortisation. Additionally, Column B shows that not all contexts have been analysed homogeneously, the most abundant being those developed in the EU and in the US (46 and 49 respectively), two more studies that jointly analyse both contexts and three are worldwide. Other contexts such as Australia and Asia follow, thus IFRS are more common in the literature.

Results are diverse and complex, but if we simplify them into those that highlight a positive or negative attribute for the amortisation or impairment model, in Column C, we find that: only six of them indicate either a positive or negative attribute for the amortisation model (2.21% in both cases); 24 do indicate a positive attribute for the impairment model (17.65%); and 43 a negative attribute (31.62%). Regarding the impairment and looking at the lines of research, we note that most of the studies that highlight a positive attribute are from lines 2 and 3, which express value relevance, timeliness and the ability of goodwill numbers to make predictions. However, line 2, which is related to market perceptions, is one that presents more mixed results. The ones that highlight a negative attribute are those from lines 4 and 5. They comprise a vast majority of the studies classified in those lines and they relate the negative attributes to questions of its recognition (discretion incentives) and the disclosure in the notes (low level of disclosure). The rest of the studies (46.32%) indicate other types of results that will be discussed in the following section.

4. Results

4.1 Research Line 1: Contrast of the Application of Different Goodwill Accounting Practices

While the accounting rules for goodwill have been developing, a series of studies that seek to analyse the effects of the implementation of the different accounting practices have emerged. Overall, the results indicate the existence of differences in accounting figures and financial ratios as a result of the application of different methods for the recognition and measurement of goodwill (appendix Table A summarises studies of this research line).

Research also recognizes the influence of firm factors (firm characteristics and managerial incentives) and country factors (institutional and economic conditions) on accounting policy choice incentives (Alexander & Archer, 1996; Cavero, *et al.*, 2021; Hong, *et al.*, 2018; Wines & Ferguson, 1993). More specifically, Wines and Ferguson (1993) find that Australian listed firms show a preference for the capitalisation of identifiable intangibles in order to reduce the impact of goodwill amortisation on operating profit. Emenyounu and Gray (1992) illustrate that while the majority of German and UK firms prefer to write off goodwill against reserves, most French firms capitalised and amortised it. From another point of view, Lee and Choi (1992) find that the higher premiums by U.K. firms compared to US firms are associated with differences in goodwill accounting treatments. Meanwhile, Larrán *et al.* (2000) identify some firm factors, indicating that if goodwill is immediately written off against reserves, the debt ratio will be higher and the ROA and ROE ratios lower than if it is considered as an asset and amortises it systematically. In turn, authors such as Giner and Pardo (2004) and Gabás *et al.* (1999) also indicate that the acquiring firm has an interest in its choice of the pooling of interests method rather than the purchase method as it can avoid the subsequent recording of a goodwill amortisation loss.

These results illustrate the understanding of the effects of the different goodwill accounting practices in balance sheets and profit and loss accounts and the reasons for their choice. Moreover, they are important for identifying the differences among goodwill accounting practices since, in line with authors such as Callao *et al.* (2007) and Cavero *et al.* (2021), their existence could endanger the comparability of financial statements. Despite applying the impairment model, André *et al.* (2016) find differences in the frequency and magnitude of goodwill impairment losses reported by European listed firms compared with what is reported by US listed firms. Their findings reveal that during the financial crisis, European listed firms reported a significantly smaller proportion of goodwill impairment losses with respect to goodwill balances than US listed firms.

Regarding the positions shown towards the different accounting treatments, almost all of the studies collected in this line of research do not take a clear stance in favour or against them. Only three of the 19 studies support the impairment test (Chalmers, *et al.*, 2011; Cheng, *et al.*, 2018; Johnson, *et al.*, 2021), while Li and Sloan (2017) defend systematic amortisation with a periodic impairment test. They illustrate that challenges in verifying fair value estimates contribute to the relatively more inflated goodwill balances and less timely recognition of goodwill impairment losses of the US listed firms they examined during the impairment-only regime. It is also of interest in this regard to highlight the findings by Chalmers *et al.* (2011), Hamberg *et al.* (2011) and Cavero *et al.* (2021). In their comparison of the two models, they document that goodwill balances are higher and expenses related to goodwill positions are markedly lower after the introduction of the impairment model.

In contrast, the rest simply indicate whether there are any differences without indicating which accounting practice would be more suitable for preparing financial statements on the basis of the fundamental qualities considered by standard setters: two fundamental qualities of relevance and faithful representation, four enhancing qualities of neutrality, verifiability, understandability and timeliness, and the pervasive cost constraint (see the Basis for Conclusions to SFAS 142 and to IFRS 3 and IAS 36).

Other characteristics of this group of research that should be mentioned are: more than half of the collected studies are developed in EU and the most analysed aspects are the contrast of the accounting methods of the business combinations - pooling of interest method versus purchase method; and the contrast two of the dominant accounting models for goodwill - amortisation versus impairment. The periods examined are around an average of six years, although the majority tend to have a shorter and less contemporary expansion. In turn, the size and composition of the samples are varied and there is usually no distinction between the different sectors, although many of them exclude financial firms due to their accounting particularities. Lastly, as the statistical methods and variables used are very diverse, the results are not comparable since they are obtained from different study constructions.

4.2 Research Line 2: Relevance and Timeliness of Goodwill Numbers in the Stock Markets

A great number of studies focus on the reactions of the capital market towards accounting goodwill numbers (goodwill, goodwill amortisation and goodwill impairment). We summarise studies in appendix Table B.

Most of them design a regression model (mostly a version of the Ohlson model) which includes market values – share price or firm's returns – as dependent variables and the amounts of the goodwill numbers as independent variables. The interpretation of the results is based on obtaining associations among the variables. When the associations are positive for goodwill and negative for goodwill amortisation and impairment amounts, researchers declare that goodwill numbers are relevant and timely under the applied model (amortisation or impairment), and therefore they are useful for the markets. As these studies are based on causal inference, we must be cautious with the results since they could be alternative explanations to these associations (Gow, *et al.*, 2016). Especially when they use data from the period before and after the introduction of the impairment model to analyse the effects of its introduction. This comparison may be affected by managerial incentives (e.g. before the introduction of the impairment test firms could use accounting policies that allowed them to avoid recognising goodwill), the financial crisis or other events. Additionally, market-based tests provide only indirect evidence about the information contained in goodwill impairments because they use share prices as proxies (Jarva, 2009).

Given the objective of these studies, the sample of firms corresponds to listed firms. Most of the studies do not distinguish between sectors and the sample sizes are varied. Nevertheless, almost half of them are developed in the US, where samples are usually considerably larger than others, reaching more than a thousand firms in some cases. The periods analysed correspond to those prior to the accounting convergence as well as to the periods subsequent to the approval of the impairment test. Most analyse periods that span several years, with an average of more than seven years.

Several studies conclude that goodwill is relevant and is perceived by the different markets as an asset (Churyk & Chewning, 2003; Jennings, *et al.*, 1996; Ji & Lu, 2014) and some of them perceive greater relevance under the impairment model – both under IFRS and SFAS – (Al-Hiyari & Latif, 2016; Burger & Wen, 2021; Eloff & Villiers, 2015; Oliveira, *et al.*, 2010). Meanwhile, McCarthy and Schneider (1995) observe that it is perceived differently from the rest of the assets, but they do not obtain evidence to explain this fact. Years later, Henning *et al.* (2000) go a step further with market perceptions of goodwill and they analyse the different components of goodwill identified by Johnson and Petrone (1998). They find that only the “core goodwill” component is seen as an asset, suggesting that it is important to understand the economic nature of the different components of goodwill.

In relation to the relevance and timing of amortisation or impairment, the results are not uniform. On the one hand, we find studies that support the relevance of amortisation (Churyk & Chewning, 2003; Shahwan & Roudaki, 2016). On the other hand, others reveal that in addition to being arbitrary, the systematic loss of value due to amortisation lacks relevance and timeliness for the market when they make evaluations and decisions (Giner & Pardo, 2007; Jennings, *et al.*, 2001; Moehrl, *et al.*, 2001). Additionally, the amortisation period can be motivated by capital market, contracting or political motives (Boennen & Glaum, 2014). Henning *et al.* (2000) show that firms made ample use of the time frame allowed for goodwill amortisation, while Skinner (1993) finds extended amortisation for firms with accounting-based bonus plans and high leverage. Nevertheless, even though Hamberg and Beisland (2014) demonstrate that amortisation is not relevant, they defend a two-component model (amortisation plus impairment when required). In their regressions, they find that the impairment component is significant only when it is carried out together with amortisation.

We also find studies that document the lack of relevance and timeliness of goodwill impairment (Cheng, *et al.*, 2017; Van Hulzen, *et al.*, 2011) and others that reveal that impairment is more relevant and timelier than amortisation (Bens, *et al.*, 2011; Eloff & Villiers, 2015; Xu, *et al.*, 2011). Within this stream of studies, Li *et al.* (2011), who find that the impairment of goodwill is relevant, also highlight that some firms could be using their managerial discretion to avoid taking a loss. Similarly, although AbuGhazaleh *et al.* (2012) support it, they express their concern about the discretion afforded by the impairment-only test model. They defend that managers are provided with a framework to reliably convey their private information on future cash flows, but they can also use the impairment test to act opportunistically and distort the underlying economic situation of the firm.

Other studies also point to certain factors as causing relevant or timely information through the impairment test. Baboukardos and Rimmel (2014) point out that the information presented under IFRS is relevant if firms comply substantially with IFRS disclosures. Lapointe-Antunes *et al.* (2009) argue that an effective audit committee reduces managerial discretion, and in these cases, impairment is perceived as a sufficiently reliable loss by investors. Others indicate cross country factors. Knauer and Wöhrmann (2016) and Alshehabi *et al.* (2021) point out that a country's level of legal

protection affects market reactions, while Laghi *et al.* (2013) and Sahut *et al.* (2011), find differences among the different EU countries, despite the use of common accounting standards. However, they do not identify which factors are affecting these relationships or how they are affecting them. In this sense, further investigation should take an interest in understanding these differences and identifying country specific factors, such as legal and regulatory environment or economic conditions. Likewise, there is a need for more evidence about other firm factors (firm characteristics and managerial incentives) that could influence value relevance and timeliness of goodwill numbers. Furthermore, given that the results of this group of studies are mixed and contradictory, the question about whether the impairment model provides more useful information to investors relative to amortization remains unanswered. Further future research needs to examine market reactions by comparing the amortization model against the impairment model.

4.3 Research Line 3: Ability of Goodwill Numbers to Make Predictions

This line of research groups a stream of studies that have tried to analyse a highly important question: the ability of goodwill numbers – especially, goodwill impairment – to make predictions (see appendix Table C for summary of studies). To do this, the majority of them analyse the variations in cash flows or earnings according to goodwill numbers through regression models. This adds a new dimension to the analysis of the usefulness of the information transmitted by goodwill numbers, which is not limited to the variables of capital markets as in the previous line of research, and thereby avoids the problems associated with the use of market values, as pointed out by authors such as Ramanna (2008), Jarva (2009), Lee (2011) and Hamberg and Beisland (2014). Yet, these studies have problems of causal inference similar to those discussed in the prior section and they use firm-level proxies rather than data from the cash generating units (or under SFAS, reporting units). Likewise, not all of them define and measure the variables in the same way which may constitute an important source of the mixed results.

Once again, most of the studies analyse the US context, while the studies that focus on IFRS analyse diverse countries (such as Australia, Finland, Malaysia, Jordan and European countries). In general, studies take data from periods that range from five to fifteen years, although the study by Jarva and Lantto (2012) takes data from one year alone. Most contrast two periods, the period before and the period after the approval of the impairment test, but only the studies by Xue and Xu (2021), Amorós and Caveró (2018), Masoud (2017), and Al-Hiyari *et al.* (2016a) take data from recent years. Nevertheless, the latter only covers a very short period of two years and none of them refers to the US context. Samples are usually considerably larger in SFAS studies and there is a certain inclination towards the analysis of listed firms.

What is striking in this line of research is the lack of studies covering samples from several countries and the lack of a deeper analysis about the factors that could be affecting these relations, at firm level as well as across countries. Thus, further exploration about these issues is needed to complement and enrich the results of this analysis.

The most generalised results show that goodwill numbers recognised under the impairment model have a significant ability to make predictions (Bostwick, *et al.*, 2016; Yehuda, *et al.*, 2017). Even, authors such as Lee (2011), Lee and Yoon (2012) in the SFAS context, or Amorós and Caveró (2018), Chalmers *et al.* (2012) and Masoud (2017) in the IFRS context, show an improvement in the usefulness and the ability of goodwill numbers to forecast future cash flows or earnings under the impairment test. Nevertheless, in the SFAS context, Chen *et al.* (2015) find that analysts' forecasts are less accurate and more dispersed for firms that report goodwill impairment charges than those that do not. Besides this, despite finding a relation between goodwill write-offs and future cash-flows, Jarva (2009), continues to emphasise the discretion inherent in this model. Also, in a subsequent study, he finds no evidence that investors and analysts fixate on SFAS 142 goodwill write-offs (Jarva, 2014). Referring to IFRS, Al-Hiyari *et al.* (2016a) only find that goodwill has a significant ability to predict future cash flows when firms are audited by the Big 4 auditors. But in this case, one must bear in mind the extra cost that this could imply for the firms to be audited. Jarva (2014) finds evidence that write-off firms pay higher audit fees because an extra audit effort or risk for the auditor is required.

4.4 Research Line 4: Determinants of Goodwill Impairment

This line of research stands out for the number of studies collected and their appearance after the adoption of the impairment test resulting from the convergence of accounting international standards. It analyses the reasons or factors that lead firms to recognise an impairment loss in goodwill (see appendix Table D for summary of studies).

In general, these studies use Tobit and Logit regression models to identify the determinants of goodwill impairment and to detect whether firms behave opportunistically. The opportunistic behaviours identified and most explored are the recognition (or not) of goodwill impairment loss, the timeliness in its recognition, and the amount of loss recognised. For this purpose, explanatory variables related to “agency”, “big bath” and “income smoothing” theories are used. The most common are variables related to a firm's characteristics: financial data, characteristics of debt covenants and CEO's characteristics (such as tenure or bonus plans). Nevertheless, we must be careful with the results obtained in these studies since, as Bens (2006) points out, the relations can be casual. This author argues that explanatory variables could capture a number of related factors that do not necessarily reflect an opportunistic behaviour. Thus, control variables must be properly and cautiously defined to capture all relevant factors that may influence the relations. Still, they use firm-level proxies and a great variety of measures have been applied in empirical studies for the variables, which may constitute an important source of the inconclusiveness of previous empirical findings and may account substantively for the failure to establish consensus hitherto.

The contexts and the extent of the periods analysed are diverse, although few of them take periods of more than five years. Most of them are carried out in a single country. Only six of the 35 studies analyse data from samples of firms belonging to different countries: three are on EU firms (Avallone & Quagli, 2015; Detzen & Zülch, 2012; Verriest & Gaeremynck, 2009); one on Australian and New Zealand firms (Carlin & Finch, 2010); one within the scope of the SFAS, on a sample of US and non-US firms (Swanson, *et al.*, 2013); and only one worldwide (Glaum, *et al.*, 2018). Therefore, the identification of country factors is limited. Additionally, most of the studies analyse listed firms and few include factors related to sector or incorporate unlisted firms.

The vast majority sustain that impairment reflects the underlying economic situation of a business as claimed by FASB and IASB (FASB, 2001; IASB, 2004a, 2004c), but they also assert that firms exercise the discretion inherent in the implementation of the impairment test, both in the SFAS context (see for example Beatty & Weber, 2006; Kim & Bay, 2017; Sun, 2016; Zang, 2008) and in IFRS contexts (see for example Abdul, 2015; AbuGhazaleh, *et al.*, 2011; Korosec, *et al.*, 2016; Vogt, *et al.*, 2016). Three decades ago authors such as Zucca and Campbell (1992) and Rees *et al.* (1996) already pointed out the existence of opportunistic behaviours when firms have to recognise a write-down. They find that write-downs are used to manage earnings according to the “big bath” and “income smoothing” theories. Later, Beatty and Weber (2006) obtained evidence suggesting that contracting and market incentives affect firms’ decisions to accelerate or delay goodwill impairment and its presentations in the income statement. Ramanna and Watts (2012) find some evidence of agency motives (particularly CEO compensation, CEO reputation, and debt-covenant violation concerns) in avoiding goodwill impairment. They also find some evidence suggesting that managers’ flexibility in avoiding goodwill impairment increases with the number and size of the reporting units, and the unverifiable net assets in reporting units. However, they do not confirm that firms use this discretion when they transmit their private information. In the scope of the IFRS, Gros and Koch (2019) do also find that managers act opportunistically “to clear the deck” and to meet or beat analysts’ forecasts. Giner and Pardo (2015) find that opportunistic behaviour among Spanish managers is related to “big bath” and “income smoothing” theories, and also that firm size affects managers’ decisions because of the cost and complexity of running the impairment test. Likewise, Al-Hiyari *et al.* (2016b) support opportunistic behaviour, finding that new CEOs of Malaysian firms tend to recognise higher impairments only when earnings are positive.

In a multi-country study, Avallone and Quagli (2015) show that firms use the growth rate to avoid goodwill impairment and they related this result to a problem of a low level of disclosure. However, these authors, whose study is based on a sample of German, Italian and U.K. firms, do not analyse the possible country factors that may exist (they only include the variable country as a fixed effect in their models). In contrast, Detzen and Zülch (2012), in their paper about CEOs’ bonus and the amount of goodwill recognised, find differences in EU countries, showing more earnings management in continental EU countries. Their results show that potentially higher bonuses lead managers to recognise more goodwill and they recommend that bonus caps should be introduced to limit CEOs’ bonuses. Additional insights about these and other country factors could be provided in future investigations.

From another perspective, Hayn and Hughes (2006) provide a prediction model of impairment which includes performance indicators generated by business combination, as well as incorporating acquisition characteristics. However, due to the limited information transmitted in the financial statements and the fact that in many cases its recognition is delayed, they detect difficulties in estimating goodwill impairment. In addition, one must be cautious about their results since the analysis is carried out in a period prior to the adoption of SFAS and the performance indicators refer mainly to the firm as a whole and not to a unit to which goodwill has been assigned.

On the other hand, some authors identify some mechanisms to mitigate discretionary behaviours, such as the implementation of strong governance mechanisms (AbuGhazaleh, *et al.*, 2011; Glaum, *et al.*, 2018; Gros & Koch, 2019; Gu & Lev, 2011; Kabir & Rahman, 2016; Verriest & Gaeremynck, 2009), the systematisation of procedures in the implementation of the impairment test (Petersen & Plenborg, 2010), the independence of boards and audit committees (Abdul, 2017) and auditing enforcement system (Glaum, *et al.*, 2018). In addition, authors such as Avallone and Quagli (2015) insist that a higher level of disclosure and, specifically, higher compliance with standard requirements improve the accuracy that firms use in the impairment test of goodwill. In these contexts, standard setters and regulators should take into account these mechanisms, as they could increase the reliability and accuracy of the information transmitted through goodwill impairment. Also, they have to take into account the existing difficulty in auditing the impairment and try to mitigate the incentives for auditors to deliver lenient audits as Ferramosca *et al.* (2017) found in their investigation.

4.5 Research Line 5: Disclosures in the Notes about Goodwill and Goodwill Impairment

Appendix Table E summarises studies of the level of disclosure and the quality of goodwill and the goodwill impairment test in accordance with the requirements of the standards.

Attention is drawn to the low number of studies that analyse the context of the SFAS; EU and Australia, and therefore the scope of the IFRS, are the most studied contexts. In addition, most of them are carried out in a single country. Only four of the 19 studies investigate at a multi-country level (D’Alauro, 2013; Glaum, *et al.*, 2013; Mazzi, André, *et al.*, 2017; Mazzi, Slack, *et al.*, 2018), all of which are in the EU context. However, D’Alauro (2013) does not analyse the possible country factors (institutional and economic conditions) that could generate differences between countries. Again, listed firms are the most analysed and less visible firms, such as unlisted or smaller size firms, are scarcely studied. Neither the size of the

samples is excessive nor are the periods notably extensive. Most analyse periods of less than four years, preventing the observation of any change in trends, behaviours or experience gained in disclosures. Likewise, it would be interesting to look deeper into the latest financial statements to find out whether the latest enforcements on disclosures adopted in the international standards improve the disclosures of the impairment test; and more specifically, whether these enforcements encourage firms to generate more useful information and decrease the discretion exercised by firms.

The method used by the majority is a disclosure checklist or an unweighted index method. Thus, fundamental data – such as identification of cash generation units, goodwill allocations, projected cash flows or discount rates applied – does not have greater significance than other requirements of the standards for this item. In addition, as Carvalho *et al.* (2016a) indicate in their study, the total number of requirements that are included in the indices varies from one study to another, limiting the comparison of the results reported. Another relevant aspect is that the majority focus on the level of disclosure when it is equally important to analyse the causes and effects of these disclosure levels at both a single-country level and a multi-country level. Note that, those that analyse factors that affect disclosure include proxies for economic factors underlying goodwill (e.g., Glaum, *et al.*, 2013; Shalev, 2009), having problems similar to those discussed in the previous lines of research. Thus, there are opportunities to expand the research evidence.

The results obtained in this line of research show a worrying lack of disclosure and a low level of compliance with information requirements, even in the basic or relevant disclosure requirements of goodwill (Carlin, *et al.*, 2010; Khairi, *et al.*, 2013). Particularly, for a sample of US firms, Shalev (2009) finds that there is no information about the allocation of the acquisition cost and the factors that justify goodwill. In the case of the Italians, Izzo *et al.* (2013) detect greater information deficiencies about the discount rate of future cash flows and the growth rate of the terminal value of cash flow. Camodeca *et al.* (2013) also observe a high level of discretion among U.K. firms in the main variables on which the discounted cash flow model is based (terminal value, cost of capital and growth rate).

Along with this lack of information, differences are also found in disclosure levels across countries (Glaum, *et al.*, 2013; Mazzi, André, *et al.*, 2017; Mazzi, Slack, *et al.*, 2018) and within a country across firms (Bepari & Mollik, 2015; Bepari, *et al.*, 2014; Kabir, *et al.*, 2020; Maratno, 2015). This is alarming since, even under the same reporting format, the level of the information is not the same and this could complicate the understanding and comparison of financial statements.

Regarding the trend of disclosures, some observe an increase in the data transmitted over time (Biancone, 2012; D'Alauro, 2013; Guthrie & Pang, 2013) and during the global financial crisis (Bepari, *et al.*, 2014), while others observe just the opposite (Camodeca, *et al.*, 2013; Carvalho, *et al.*, 2016b).

Although different authors express dissatisfaction with the information revealed, the results seem to suggest that the problem is more related to a lack of compliance with the requirements of the standards than to the need to reinforce data requirements. In any case, these results require special attention since the omission of such information does not allow the assessment of the estimates made and it could be used to the firms' advantage due to the information asymmetries that it generates. Sevin *et al.* (2007) find that US firms are not willing to provide information voluntarily. Thus, this type of action should be limited, and more transparent behaviours should be encouraged. For this reason, we must take into account the factors that motivate these behaviours and force firms to not only transmit higher levels of information, but to also present higher quality information. In this sense, Glaum *et al.* (2013) point to factors such as accounting traditions, previous experience with the standards, the strength of enforcement mechanisms, the size of the capital market, the type of auditor and the existence of audit committees. Additionally, Maratno (2015) highlights contract and reputation motives, while Shalev (2009) points to acquirers' performance and abnormal goodwill. Therefore, based on these findings and following Bepari and Mollik (2015), we point out some measures that could be adopted: the application of enforcement mechanisms, the imposition of greater and qualified audit attention, increasing firms' experience, or reducing the complexity of the application of mandatory disclosure requirements.

4.6 Research Line 6: Goodwill Initial Recognition and Purchase Price Allocation

As current debates revolve around subsequent accounting for goodwill, there has been much less focus on the initial accounting and nature. Nevertheless, the subsequent accounting for goodwill is determined by its initial accounting treatment. Therefore, it is also important to explore those investigations that have focused on this matter (see appendix Table F for summary of studies).

There is a great diversity in the designs and the methods applied. Nevertheless, regression analysis is the prevalent method used in these studies. Once again, these studies use proxies for their models and causal inferences, presenting problems similar to those described in the previous lines. The contexts analysed are less varied, the majority focus on the US, the EU and Australia. Most of them conduct their investigations in a single country, while only two of the 14 are conducted in a multi-country context (Giuliani & Bränström, 2011; Shalev, *et al.*, 2013).

Among the earlier studies carried out in this line of research, those by Grinyer *et al.* (1991) stand out. Three decades ago, these authors observed managerial choices in the allocations of the purchase price in accordance with the "trade-off" hypothesis. With respect to this last result, more recently Zhang and Zhang (2017) and Bugeja and Loyeung (2015) indicate that the managerial incentives arising from the differential treatments of goodwill and identifiable intangibility only exist in the post SFAS period. They point out that purchase price allocation is made in order to avoid recognising amortisations (high proportions are allocated to goodwill rather than to other depreciable or amortisable assets). They also find that the

amount allocated to goodwill is related to leverage before the acquisition, the takeover premium paid, or the target industry, which are all inconsistent with opportunism but reflect firm characteristics and takeover characteristics. Moreover, Paugam *et al.* (2015) also observe that purchase price allocations are informative for investors. Shalev *et al.* (2013) find that bonuses create stronger incentives to overstate goodwill, but this overstatement of goodwill diminishes when cash flows, sales, or earning growth is used as a performance measure in bonus plans. Nevertheless, Frii and Hamberg (2021) find no evidence that earning-based compensation affects the proportion of the purchased price accounted for goodwill.

Finally, other less noteworthy issues in the literature included in this line of research are internally generated goodwill and negative goodwill. On the one hand, Zhang (2013) finds an association between internally generated goodwill and financial performance and price-earnings. Bloom (2009) also defends the recognition of internal goodwill and he provides a new accounting treatment for goodwill that distinguishes between purchased goodwill and internally generated goodwill. Nevertheless, it is based on market capitalisation values and his results are limited to an Australian-firm sample. Further investigation is needed to verify its effectiveness in different types of firms and economic contexts. In contrast, Su and Wells (2015) suggest that there is no reason for distinguishing between acquired and internally generated and revalued identifiable intangible assets. Finally, only Comiskey *et al.* (2010) examine negative goodwill and they do not find sufficient evidence on its relevance to the markets. Further investigations on the topic of internal and negative goodwill would provide useful evidence about the importance of recognising these items.

4.7 Research Line 7: Other Studies on Goodwill Accounting Practices and Preferences

This last line of research includes studies that have analysed goodwill accounting practices and preferences from different perspectives. As the research objectives presented in this group of study are diverse, to separate them in different lines of research would not be practical. We summarise studies in appendix Table G. To the extent they use causal inferences and proxies for their model, these studies have validity problems as described in the previous lines of research.

One interesting result is that found by Petersen and Plenborg (2010), who find inconsistencies in the implementation of the impairment test, but they emphasise that these inconsistencies are reduced when Danish firms systematise their procedures and use professionals with considerable valuation experience. In the Australian context, Carlin and Finch (2009) also detect inconsistencies in the implementation of the impairment test suggesting an inappropriate use of discount rates. Meanwhile, after examining the performance of sample segments and disclosed goodwill impairment loss, Ji (2013) provided evidence consistent with the phenomenon of delayed and avoided goodwill impairment.

In another dimension of the investigation of the impairment model, Visvanathan (2017) has analysed the role of the auditor. This author states that auditors demand more fees from those firms whose potential impairment concerns are higher, which is also in line with the results obtained by Chen *et al.* (2019) included in the research line 5. These results are important since, as discussed in research line 4, although we can use auditors as a mechanism to alleviate the problems of the impairment test, we must keep in mind the cost of these mechanisms. Further investigation about the cost and effectiveness of these mechanisms should be carried out in greater depth.

Finally, Ferramosca and Allegrini (2021) analysed chief financial officers' perception of adopting an impairment model compared to an amortisation model. Their results suggest that preparers' individual characteristics and perceptions as well as firms' characteristics and countries' accounting cultures influence the preference for goodwill accounting models. As these authors indicate and as we also note in this review, there has been ample literature on the value relevance of goodwill and on its value manipulation. Therefore, future research could investigate how the impairment model is perceived and implemented in practice by managers, CFOs and other financial statement preparers.

5. Discussion and Conclusions

This critical review highlights that accounting for goodwill is not a precise science and it is difficult at this stage to resolve doubts, and less so, if the solution is limited to choosing between these two models. In this review, the results of the first line of research illustrate that the application of different accounting alternatives creates differences in the information provided. This is relevant since these differences could jeopardise the comparability among firms that apply different accounting practices. This line also shows that there are some factors that affect the decision to choose from among accounting policies and they must be taken into account to avoid discretionary behaviour between firms. In the second line the relevance of goodwill for the market is highlighted, and the results with respect to amortisation and impairment are not uniform. Nonetheless, goodwill impairment appears to be more timely in countries with stronger accounting enforcement and with higher levels of disclosure compliance. From another perspective, the third line corroborates the relevance of goodwill impairment, where most studies show an improvement in the usefulness and ability of goodwill numbers to make predictions after the adoption of the impairment test.

In contrast, the fourth and fifth lines of research show some negative aspects related to the cost and complexity of conducting the impairment test and the discretion afforded. In the former, studies on the determinants of goodwill impairment confirm its strong association with economic factors, and also with managerial and firm incentives in order to accelerate or delay impairments. In the latter, studies claim the low level of disclosure in the notes about the impairment test process. This could also be encouraging the discretionary behaviours of firms and the transmission of unreliable and untimely information about impairment loss, which makes it difficult to verify. Moreover, the problem of the low level of disclosure seems to be

more related to a lack of compliance with the requirements of the standards. Finally, in the last two lines of research, we again find arguments for and against from different perspectives, especially in the implementation of the impairment test and the allocations of purchase price between goodwill and other intangibles. Findings suggest that larger portions of the cost of acquisitions are allocated to goodwill when a firm's income is sensitive to reductions in earnings caused by the depreciation and amortisation of individually recognized assets. Moreover, studies that link goodwill impairment to the characteristics of earlier acquisitions that gave rise to goodwill reveal that overpricing of acquisitions is a root cause of impairments. However, once again, the possibility of using certain mechanisms to improve its implementation or even the implementation of the new accounting treatment for goodwill is highlighted.

Besides this, some of them state that the reintroduction of systematic amortisation without eliminating the impairment test generates a dual context in goodwill accounting, which would make the comparability and comprehension of financial statements difficult. Thus, it could be dangerous to go back to the amortisation model, which is not free from criticism either and even less so in conjunction with the impairment test model in some jurisdictions. Before re-introducing the amortisation model, the international regulating bodies should work together and open up a process of debate and reflection with a global convergence in mind.

Conceptually, the amortisation model is a mechanical and systematic loss that is not free to present certain subjectivity in what refers to specified useful life. On the contrary, impairment is a more discretionary model, but if it is properly implemented, it could provide a more useful loss and be more effective. Hence, it seems that standards setters have to face the decision of moving towards more relevant as well as more reliable financial statements. Additionally, the impairment model offers more room for improvement than the amortisation model. Thus, the way forward is to focus more on improving the impairment model, which could offer a good balance between relevant and reliable estimates. In this sense, various aspects have to be considered in this line. Primarily, due to its residual nature, goodwill can be composed of different components. One of the criticisms highlighted about this aspect is that purchase price allocations can be manipulated, and this affects its subsequent account valuations. Knowing exactly what the components aggregated under goodwill are and making guidelines that minimise the aggregation of different assets within it are decisive to finding the correct model for its accounting and reducing discretion in purchase price allocations. Even though separating and measuring the different components of goodwill could be a complex and costly task, it is necessary to introduce a discussion about it, since the main difficulty of the current standards comes from the fact that goodwill must be treated as a whole, in spite of the major differences between its components.

Another relevant aspect is that the guidance of the impairment test needs clarification and simplification. One action that can be taken is to offer an explicit and more delimited guide about the implementation of the impairment test. This would increase its accuracy and reduce its subjectivity since it would limit the opportunistic management of the amounts and the frequency of impairments. Another action is to consider the effectiveness of the measures taken by the FASB when incorporating a qualitative assessment to determine if there is a need to perform an impairment test.

Likewise, it is equally important to increase transparency and overcome the lack of relevant and reliable goodwill disclosures in financial statements. On the one hand, this would allow for a better understanding of the decisions taken and, on the other hand, it would limit the actions by firms. Nevertheless, before requiring more information that is unnecessary for users or sensitive for firms, goodwill should be analysed from the perspective of users of financial statements to identify what represents substantial data for understanding goodwill valuations. Moreover, rather than request more disclosure, the efforts and measures to be adopted should address compliance in the information transmitted about goodwill valuations and the chosen criteria. In this sense, firms should be forced to transmit more explicit and transparent information when explaining why the business combination has been undertaken, how the operation has been carried out and what their future expectations are.

Additionally, along with all these actions, consideration should also be given to the role that auditors and the firm's corporate governance can play in detecting and reducing abusive behaviour. Therefore, it is also important to direct efforts towards training these actors in the proper supervision of the implementation of the impairment test.

Finally, in line with the above recommendations and given the limitations shown in the research lines identified in this review, it would be useful to carry out future lines of research that would consolidate all these conclusions, as well as analysing other topics related to the accounting of goodwill that have been unaddressed so far. Although some results have already been commented on in each of the six lines of research, we should highlight the opportunity to transfer the results obtained to other types of samples and contexts (other than listed firms and EU or US contexts). Likewise, multi-country studies could be developed since they are not abundant and even less so within the scope of SFAS. Moreover, most studies use limited time series; therefore, it would also be prudent to conduct studies covering longer periods, thus changes in trends and in evolution of behaviours can be observed. Finally, it could be of interest to analyse the effects and benefits of the latest amendments in goodwill international accounting that try to simplify the implementation of the impairment test (especially those made by the FASB) and require more information. In this sense, it could be useful to verify how far reducing its complexity and cost has been achieved: whether FASB's latest amendments are creating disadvantages for other firms; whether they are jeopardizing the comparability and understanding of the information transmitted under different accounting practices; and whether the enforcement of mandatory disclosure has improved the usefulness of the information. Regarding this last issue, it is also necessary to know which factors (firm and country factors) affect the level of disclosure provided to establish efficient enforcement mechanisms that make firms reveal relevant information for users.

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Appendix

Table A. Main empirical studies that contrast the application of different goodwill accounting practices (research line 1).

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Colley and Volkan (1988)	Financial consequences of no capitalisation of goodwill	310 US firm-years	1980-1984	Debt-to-equity, ROA and goodwill to asset ratio		Differences comparison	Direct write off of goodwill against equity produces minimal impact on the ROA and modest on the debt-to-equity ratios
Emenyounu and Gray (1992)	Existence of differences in accounting measurement practices	26 large industrial firms from each country: France, Germany and the UK	1989	Treatment of Goodwill: capitalisation and written-off, and written-off against reserves		Chi-square test and the I-index	There are significant differences between France, Germany and the UK. In Germany and the UK the majority of firms have not capitalised goodwill, preferring to write it off against reserves.
Lee and Choi (1992)	Differences in the premia offered by non-US acquirers when bidding for US target firms	1217 US 40 Japanese and 15 German acquisitions	1985-1989	Merger premium	Goodwill	Regression analysis	Merger premia offered by foreign acquirers who enjoy advantageous accounting or tax treatments are higher. Goodwill accounting does explain merger premia
Wines and Ferguson (1993)	Accounting policies adopted for goodwill and for identifiable intangible assets	150 Australian listed firms	1985-1989	Accounting policies alternatives for goodwill		Descriptive analyses of frequency	Firms recognised identifiable intangibles to reduce the impact of goodwill amortisation on reported operating profits
Archel et al. (1995)	Consequences of the first consolidation difference day and the goodwill amortisation period	81 Spanish firms	1992	Date of calculation of the difference and goodwill amortisation period	Sector, sales, total assets, earnings, financial expenses and equity	F-test and Kruskal-Wallis test	The election of the calculation of the first consolidation difference date and the goodwill amortisation period are not relevant factors
Alexander and Archer (1996)	The treatments of the consolidation difference in two EU member states	70 France firms and 70 UK firms	1988-1992	Goodwill treatments and disclosure practices	Gearing	Frequency analyses, logistic regression and Chi-squared test	Substantial differences exist between the French and British treatments. The choice of treatment in the UK was influenced by the company's level of gearing. No such choice exists in France.
Gabás et al. (1999)	Factors that explain the accounting for mergers (purchase VS pooling method)	30 mergers (84 Spanish firms)	1991-1998	No differences between purchase and pooling methods	Total assets of the acquirer and acquirer, goodwill and other characteristics of the acquirer and acquiree	Wilcoxon-Mann-Whitney tests	Purchase-pooling choice is influenced by size, profitability and reserve relative to capital stock of the acquirer. Positive relationship between goodwill contained in the target and the use of the pooling of interests method.
Larrán et al. (2000)	The economic effects of goodwill amortisation VS immediately write-off	493 Spanish listed firm-years	1991-1997	ROA, ROE, debt-to-equity ratio and market value of equity	Equity excluding goodwill and goodwill	Wilcoxon test and regression model	The ratio-based business can be seen to be affected by the accounting treatment applied to goodwill. The relevance of goodwill increases over time in the Spanish capital market
Giner and Pardo (2004)	Factors that explain the accounting for mergers (purchase VS pooling method)	406 Valencian firm-years	1990-1996	Purchase and pooling method	ROA, ROE, acquirer size, participation, kind of merger, relative acquiree size, liquidity and debt-to-equity ratios	Mann-Whitney U-test and logit models	The election of the accounting method is conditioned by objectives linked to the interest of the acquirer and not to aspects related to the merger operation itself
Navarro (2004)	IFRS 3 consequences	177 Spanish firm-years	1998-2000	Debt-to-equity, ROA and ROE	Goodwill, assets, life of goodwill	T-Student test and Wilcoxon test	The goodwill regime change would only have a significant effect on those firms with high goodwill values
Callao et al. (2007)	Effects of the new standards on comparability and the relevance of financial reporting	26 Spanish firms	2005	Balance sheet figures, income statement lines and financial ratios		T-test and Wilcoxon signed-ranks test	Differences in accounting rules adversely affected comparison. No improvement in the relevance of financial reporting
Hung and Subramanyam (2007)	Effects of adopting IAS	80 German industrial firms	1998-2002	Balance sheet and income figures and ROA and leverage	Size, cross-listed, common stock, debt and industry	Descriptive analysis and probit model	Little evidence about IAS increases the value relevance of book value and net income or significantly improves the timeliness with which economic events are incorporated into accounting income
Chalmers et al. (2011)	Association between goodwill charges and firms' economic investment opportunities	4310 Australian listed firm-years	1998-2008	Goodwill charge	Investment opportunities, control variables (size, leverage, ROA and stock return)	Tobit regressions	The association between firms' goodwill charges and the firms' investment opportunities is stronger during the IFRS regime than the Australian regime.
André et al. (2016)	The patterns of goodwill impairments in EU and in the US	18538 EU and 16525 US firm-years	2006-2015	Goodwill, goodwill impairment, ROA, market-to-book, assets	Size, industry, year	Logistic model and probit model	US firms recognise timelier impairments, at least during the financial crisis. Also US firms report larger but less frequent impairments than EU firms
Li and Sloan (2017)	Comparison of the timeliness of goodwill impairments before and after SFAS 142	9049 pre-142 and 19,290 post-142 S observations	1996-2011	Goodwill impairment	Goodwill, ROA, book value of equity	Logit regressions	SFAS 142 has resulted in relatively inflated goodwill balances and untimely impairments. Managers opportunistically manipulate earnings by delaying goodwill impairment
Cheng et al. (2018)	The impact of SFAS 142 adoption on management forecast accuracy	2511 US firm-years	1998-2004	Forecast accuracy	Period, institutional ownership, analyst coverage, return volatility, number of business and segments, equity, size,	Difference-in-differences design	Firms affected by SFAS 142 experience a greater increase in their forecast accuracy. The effect is less pronounced for firms with stronger monitoring in the pre-SFAS 142 period but is

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Hong et al. (2018)	Whether differences in accounting standards (IFRS vs. U.S. GAAP) influence reporting impairment of long-lived assets	1,134 U.S. listed firm-years	2004-2012	Asset write-off	market-to-book value, ROA, return, loss, leverage, cash flows Earnings big bath, earnings smoothing, ROA, sales, operating cash flows, size, inverse Mills ratio	and regression models Heckman regression model and ordinary least squares regression	more pronounced for firms with a higher likelihood of goodwill impairment in the post-SFAS 142 period The association between impairment losses and unexpectedly high and low earnings is significantly greater for U.S. GAAP firms as compared to IFRS reporting firms, implying differences in accounting standards influence firm financial reporting
Cavero et al. (2021)	Comparison of the amortisation method and impairment method	90 Spanish-listed firms (720 observations)	2004-2011	Goodwill, goodwill reduction, ROA, ROE and leverage ratio	Size, auditor, profit, sector and crisis	Panel data technique and t-Student test	Under the impairment test, firms are likely to maintain higher amounts of goodwill and not recognise any impairment loss. Consequently, ROA and ROE are higher and leverage is lower. Results also show that the better firm performance is the larger goodwill impairment will be
Johnson et al. (2021)	The impact of SFAS 142 on the reporting quality of goodwill	29,983 U.S. firm-years	1996-2007	Buy-and hold security return minus the value-weighted return of the benchmark	Total assets, goodwill, book value of equity, cash flows, GDP, goodwill, incomes, earnings, INC, intangible assets, market value of equity, intangible assets, OIS, performance, risk, raw market return, size, tangible assets	Ordinary least squares regression	While there is a significant improvement in market participants' ability to assess the future economic benefits associated with goodwill, there does not appear to be any improvement in the market's ability to understand the future implications of other intangible assets or net assets in general

Table B. Main empirical studies regarding relevance and timeliness of goodwill numbers in the stock markets (research line 2).

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
McCarthy and Schneider (1995)	The market perception of goodwill	4989 US listed firms-years	1988-1992	Market value of stockholders' equity	Market value of assets, market value of liabilities, net income, assets, liabilities, income, goodwill,	Ohlson regression models	The market perceives goodwill as an asset and it is valued at least as much as other assets
Jennings et al. (1996)	Relation between equity values and accounting goodwill numbers (Amortisation VS immediately write-off)	259 US listed firms	1982-1988	Market value of equity 3 months after year end	Component of expected future earning, including goodwill amortisation, book value of assets, liabilities and stockholders' equity	Cross-sectional regression and earnings capitalisation model	Goodwill is viewed as an asset decline in value. The annual goodwill review, if properly implemented, may have the potential to best represent the resources and performance of the firm
Henning et al. (2000)	Whether investors distinguish among identifiable components of goodwill and goodwill amortisations	1576 US acquisitions	1990-1994	Market value first quarter of following year and returns	Book value, goodwill and goodwill components (going-concern, synergy and the residual), earnings, goodwill amortisation and its components	Regression models	"Core goodwill" component (going-concern and synergies) is conceptually an asset, while other goodwill components may not be assets. Market views residual overpayments as expenses
Jennings et al. (2001)	Effect of goodwill amortisation on the usefulness of earnings data	2918 US listed firm-years	1993-1998	Stock price 3 month after year end	Earnings per share from continuing operations before and after goodwill amortisation	Cross-sectional regression	Goodwill amortisation provides no explanatory power for prices beyond that of earnings before goodwill amortisation
Moehrlé et al. (2001)	The information content of earnings holds as it ages	2421 US listed firm-years	1988-1998	Market-adjusted returns 3 months after the year end	Market value of equity at the previous year, net income, cash flows and income before extraordinary items	Regression models	Goodwill amortisation disclosures were not decision-useful
Hirschey and Richardson (2002)	Information content of accounting goodwill numbers	10 US listed firms	1992-1996	Abnormal returns	Goodwill write-off by type of announcement, and industry	Event-study methodology	Market partially anticipates goodwill write-off decisions. Accounting theory and practice is adept at identifying when goodwill is impaired
Churyk and Chewning (2003)	Goodwill and goodwill amortisation market perception	96 US listed firms (480 observations)	1992-1996	Market value of equity	Book value of equity, goodwill, earning and goodwill amortisation	Feltham and Ohlson regression model	Market views goodwill as an economic resource that declines in value
Bugeja and Gallery (2006)	Value relevance of purchased goodwill holds as it ages	475 Australian listed firm-years	1995-2001	Share price three months after year-end	Book value of equity, intangible assets, net income and goodwill	Ohlson regression models	Recently acquired goodwill has information content whereas "older" goodwill does not, i.e., it is not considered to be an asset by investors
Giner and Pardo (2007)	Relevance of goodwill and goodwill amortisation	3227 EU observations	1997-2001	Market value at fiscal year-end and return	Goodwill and goodwill amortisation	Ohlson regression models	Goodwill is relevant, but not goodwill amortisation. Moreover, neither goodwill amortisation is timely, nor, in general, changes in goodwill amortisation
Lapointe - Antunes et al. (2009)	Value relevance and timeliness of goodwill impairment	345 Canadian listed firms	2001	Market value of equity at the end of the year and transitional goodwill impairment	Book value of equity, earnings, goodwill, goodwill impairment, reporting unit allocation, financial competence and audit-committee members and returns	Ordinary least squares regressions	Investors perceive losses sufficiently reliable and also that there are reduced opportunities for managerial discretion when there is a more effective audit committee

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Horton and Serafeim (2010)	Market reaction to, and value-relevance of, IFRS reconciliation adjustments	297 UK listed firms	2005	Cumulative abnormal return over the 11-day window, earning adjustment and disclosure	Earnings differences and adjustments, SEC company, announced reconciliation, market value, book to market ratio and industry	Event-study, ordinary least square and regression models	Adjustments attributed to impairment of goodwill are incrementally value-relevant and reveal new information
Oliveira et al. (2010)	The relevance of the identifiable intangible assets	354 Portuguese listed firm-years	1998-2008	Stock price 3 months after year end	Book value of equity, earnings, identifiable assets and goodwill	Ohlson regression models	The change to IAS/IFRS had a positive effect on the value relevance of goodwill
Bens et al. (2011)	Information content of goodwill write-offs	388 US observations	1996-2006	Abnormal returns	Goodwill write-off, market value of equity, lagged assets, intangible assets, earnings, unexpected earnings and income	Regression models	Goodwill impairments induce a significant negative stock market reaction, but this reaction is attenuated for firms with low information asymmetry and also for small firms
Li et al. (2011)	Market reaction to the announcement of a goodwill impairment loss, the nature of the information, and whether a cause of goodwill impairment can be traced back to overpayment	1584 US announcements of goodwill impairment losses	1996-2006	Abnormal returns, forecast revision and goodwill impairment loss	Unexpected impairment loss, earnings surprise and overpayment proxies	Cross-sectional regression models	The negative impact of the loss is lower in the post-SFAS 142 period. Goodwill impairment serves as a leading indicator of a decline in future profitability. Proxies for overpayment for targets can predict subsequent goodwill impairment. Firms may have used their managerial discretion to avoid taking the loss
Sahut et al. (2011)	The information content of intangible assets and goodwill	1855 EU listed firm-years	2002-2007	Share price 4 months after fiscal year-end and stock returns	Net income, book value of equity, intangible asset, goodwill, density of intangible assets	Ohlson regression models	Intangible assets are more informative under IFRS than local GAAP, but goodwill is less relevant under IFRS for investors, with the exception of Italian and Finnish investors
Van Hulzen et al. (2011)	Value relevance and a timeliness model	2091 EU firm-years	2001-2010	Market value of the company	Book value of equity, net income, goodwill amortisation and goodwill impairment	Ohlson regression models	Impairment of goodwill is actually less value relevant than amortisation, but it does lead to more timely accounting information
Xu et al. (2011)	Value relevance of goodwill impairment	431 US firm-years	2003-2006	Close price 3 months after year end and returns	Book value, earning, goodwill impairment, asset writedown, sales, ROA, asset turnover, market-to-book ratio, age of long-lived assets, size and industry	Ohlson regression models	Goodwill impairment charge is conveying value relevant information
AbuGhazaleh et al. (2012)	The value relevance of goodwill impairment losses	528 UK listed firm-years	2005-2006	Market value of equity at the end of the year	Book value of equity, pre-tax profit, goodwill, goodwill impairment loss	Multivariate ordinary least squares regression	The information content of reported goodwill figures is value relevant
Laghi et al. (2013)	Relevance of goodwill losses	835 EU listed firm-years	2008-2011	Market capitalisation 4 months after year end	Book value of equity, pre-tax profit, goodwill, goodwill impairment, credit default swaps of each country	Ohlson regression models	Country-specific factors have a significant influence on the investment decisions of market operators
Baboukardos and Rimmel (2014)	Market valuation implications of goodwill	76 Greek listed firms	2008	Market value of equity per share 4 months after fiscal year-end	Book value of equity, goodwill, net income before taxes, industry, loss and compliance level	Ohlson regression models	Fair value accounting generates relevant accounting numbers but only in firms that comply highly with IFRS disclosure requirements
Hamberg and Beisland (2014)	Relevance effects of changes in goodwill accounting	701 Swedish firm-years for GAAP and 764 for IFRS	2001-2010	Returns and value of equity at the year end	Goodwill impairment and goodwill amortisation	Ohlson regression models	Goodwill amortisations were not value-relevant. Impairments reported in addition to amortisation were significantly related to stock returns, but not, under the impairment-only regime
Ji and Lu (2014)	The relevance of intangible assets	6650 Australian listed firm-years	2001-2009	Market value of equity 3 months after year end	Tangible assets, liabilities, goodwill, identifiable intangibles and earnings	Ohlson regression models	Intangible assets are relevant in both the pre- and post-IFRS adoption periods, but it has declined in the post and they are more relevant in firms with more reliable information
Eloff and Villiers (2015)	Goodwill relevance	529 South-African listed firm-years	2001-2009	Market value of equity 3 months after year end	Book value of equity, goodwill, net income and sales	Ohlson regression models	The relevance of goodwill increases under IFRS 3
Al-Hiyari and Latif (2016)	Goodwill relevance	2576 Malaysian listed firm-years	2002-2010	Market value of equity 6 months after year-end	Book value of equity, earnings, goodwill, year, debt and size	Ohlson regression models	Goodwill is not value relevant in either the pre- or post- IFRS periods. But the association is stronger during the post-IFRS period
Knauer and Wöhrmann (2016)	Information content of goodwill write-offs	564 US and EU goodwill writedown announcements	2005-2009	Cumulative abnormal returns	Unexpected goodwill write-off, civil- law country, unexpected earnings, loss, goodwill write-off announced, size, earnings, leverage and market risk	Event study	The announcements of unexpected goodwill write-downs reveal new information. Investors react more negatively when a country's level of legal protection is low and allows more management discretion, and also when an unverifiable internal explanation is given
Shahwan and Roudaki (2016)	Goodwill amortisation relevance	Emirates listed firms	2003-2012	Market value of equity at the year end	Book value of net assets, net profits, dividends paid and goodwill amortisation	Ohlson regression models	Goodwill amortisation is informative
Bepari and Mollik (2017)	Goodwill value relevance	911 Australian firm-years	2006-2009	Market value of equity at the end of the year	Book value of equity, intangible assets, goodwill and net income.	Ohlson regression models	The impairment approach has decreased the frequency and the amount of goodwill write-off. Older goodwill is now value relevant, but not goodwill purchased during the current year

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Cheng et al. (2017)	The impact of goodwill impairment write-offs on stock returns	32098 US listed firm-years	2002-2011	Returns	Goodwill and goodwill write-off, size, sales and assets	Regression models	A short term negative reaction, but a long term positive reaction. Perceptions about goodwill impairment have changed after new rules. Some evidence of "big bath"
Alshehbi et al. (2021)	The value relevance of goodwill impairment losses in an international context	18,143 firm-year observations drawn from 21 IFRS countries	2005-2018	Market value of equity 3 months after fiscal year end	Book-value of equity, earning, goodwill, goodwill impairment, institutional quality of the country, strength of auditing and reporting standards, cultural effect and religious effect	Ohlson regression models	Goodwill impairment losses are value relevant to their investors. This relevance is higher for firms domiciled in countries with high-level institutional quality (i.e., stronger investor protection, more effective legal enforcement, and well-developed stock markets). Social norms also influence its relevance
Burger and Wen (2021)	The value relevance of goodwill relative to other accounting information and long-lived tangible assets	56,002 US listed firm-years	1988-2017	Market value of equity at fiscal year-end	Goodwill, other net assets and net income	Ohlson regression models	The value relevance of goodwill has improved following the adoption of SFAS 142

Table C. Main empirical studies regarding the ability of goodwill numbers to make predictions (research line 3).

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Jarva (2009)	The reliability of goodwill write-offs	327 US listed firm-years	2002-2006	Goodwill write-offs	Future cash-flows, size, restructuring, accounts receivable, inventory, accounts payable and accruals	Logistic model and probit model	Goodwill write-offs under SFAS 142 are associated with future expected cash flows. However, agency-based motives could exist
Lee (2011)	Change in the ability of goodwill to predict future cash flows after SFAS 142	4825 US firms (13848 firm-years)	1995-2006	Future cash flows	Net income, goodwill, goodwill charge and equity	Regression models	The ability of goodwill to predict future cash flows has improved. No compelling evidence about that SFAS 142 is used opportunistically or informatively
Chalmers et al. (2012)	Association between intangible assets and analysts' earnings forecasts	3328 Australian firm-years	1993-2007	Accuracy and dispersion of analysts' earnings forecast	Goodwill, period, other intangible, market value, operating cash, age, earnings, follow, loss, leverage, share returns, share price, industry	Regression models	The impairment goodwill approach conveys more useful information than prior to IFRS adoption
Jarva and Lantto (2012)	Information content of financial statements	94 Finnish listed firms	2004	Earnings, market value of equity at the year end and cash flows	Stock returns, book value of total assets, book value of total liabilities and earnings	Regression models	Under IFRS, earnings are no timelier in reflecting publicly available news and book values of assets and liabilities are no more relevant. IFRS earnings provide marginally greater information content for predicting future cash flows
Lee and Yoon (2012)	The effects of goodwill accounting on earnings informativeness	671 US listed firms	1995-2006	Future cash flows	Earnings, size, sales, depreciation and interest, loss and regime	Regression model	The ability of earnings to predict future operating cash flows and earnings persistence has improved after the enactment of SFAS 142
Jarva (2014)	Consequences of goodwill write-offs	4919 US firm-years	2002-2006	Goodwill write-offs	Earnings, loss, book-to-market, size, stock return, cost of equity, accruals, operating cash flows, ROA, profit margin, asset turnover, Big 4 and leverages	Multivariate analyses	No evidence that investors and analysts fixate on goodwill write-offs. Write-off firms pay higher audit fees
Chen et al. (2015)	Goodwill impairment charges and analysts' forecast accuracy and dispersion	568 US firms	2003-2007	Analysts' earnings-forecast accuracy and analysts' earnings-forecast dispersion	Goodwill impairment, unexpected earnings, earnings skewness, industry, years, size, number of analysts following, restructuring activity, foreign operation, ROA, goodwill and observation quarter	Regression models	Analysts' forecasts are less accurate and more dispersed for the impairment sample than for the control samples. Impairment charges is negatively associated with forecast accuracy and positively with forecast dispersion. However, auditor industry specialization and institutional ownership, reduce the adverse effect on analyst forecast dispersion
Al-Hiyari et al. (2016a)	Predictive ability of goodwill in the presence of Big 4 auditors	726 Malaysian firm-years	2011-2012	Cash flows	Earnings, goodwill, goodwill impairment, Big 4 auditors, year and industry	Ordinary least squares regressions.	Goodwill has a significant predictive ability for second and third-year ahead cash flows which exists only in the firms audited by the Big 4 auditors
Bostwick et al. (2016)	Relevance of goodwill impairment to cash flows prediction and forecasting	32997 US firm-years	1987-1996	Future cash flows	Cash flows, accounts receivable, inventory, accounts payable, depreciation, amortisation, goodwill impairment, restructuring costs, asset writ-downs, merger & acquisition costs	Regression model	Goodwill impairment incrementally improves cash flow prediction and forecasting
Masoud (2017)	The ability of financial analysts to forecast earnings accurately	520 Jordan listed firm-years (66 firms)	2002-2013	Earnings forecast	Forecast error, standard, size, annual analyst forecast, earnings, loss, decline, performance volatility and growth	Regression model	IFRS has improved the ability of analysts to forecast earnings (error and dispersion have decreased)

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Yehuda et al. (2017)	The ability of accounting goodwill to predict future operating performance and the implications of the goodwill impairments	2123 US publicly traded firms	2002-2006	Operating returns and goodwill impairment	Goodwill, expected economic profit/loss, assets acquired, length of the impairment window	Regression models	Adjusting goodwill to eliminate any overpayment results in a better prediction of future operating performance
Amorós and Caveró (2018)	The effects of goodwill reductions on the quality of the information	896 Spanish listed firm-years	1998-2011	Future cash flows	Goodwill, goodwill reductions, cash flows, net income equity, size, sector, auditor and profit	Regression models	The possibility of opting for different methods could distort the quality and comparability of the information and the accurate assessment of future cash flows
Xue and Xu (2021)	The impact of goodwill on analysts' forecasts	4,180 Chinese listed firm-years	2007-2016	Optimism of analysts' forecast and accuracy of analysts' earnings forecast	Goodwill, information transparency, returns, stock turnover ratio, share price, size, leverage, share held by controller, age of a company, Big4, n°. Of analysts, analysts' forecast horizon, market, industry policy, ownership, year, industry	Regression models	Goodwill can increase the optimism and decrease the accuracy of analysts' forecasts because of its low quality. Goodwill recognised initially in bull market or from the M&A without founder-chairman or founder-CEO contains more bubbles and tends to be lower quality

Table D. Main empirical studies regarding determinants of goodwill impairment (research line 4).

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Zucca and Campbell (1992)	Discretionary writedowns of impaired assets	77 observations (67 US firms)	1981-1983	Writedowns and timing	Income statement treatment of writedowns, earnings, dividend growth, debt to equity ratio and ROA	Descriptive analysis and ANOVA design	Write-downs are being used to manage earnings ("big bath" and "income smoothing")
Francis et al. (1996)	The determinants of managements' write-off decisions and security price reactions to firms' write-off announcements	674 US write-off announcements	1989-1992	Amount of write-off and returns	Returns, book-to-market, ROA, industry characteristics, change in CEO, performance, industry, and size	Tobit and ordinary least square models	Incentives play a substantial role in explaining goodwill write-offs and restructuring charges. In general, write-offs are negative news
Rees et al. (1996)	Earnings management in the year of the write-down	365 firm-years (277 firms)	1987-1992	Operating accruals	Current assets, current liabilities, depreciation and amortisation, ROA, cash flows, revenues, gross property plant and equipment, earnings, returns	Student-t, Wilcoxon Signed-Rank test and regression models	Management acts opportunistically in the year of the write-down to improve future years' reported earnings
Beatty and Weber (2006)	Managers' discretion	553 US firms	2001	Transitional goodwill impairment	Debt contract, equity market values, compensation concerns, CEO tenure, exchange listing, other control variables	Probit regression	Managerial incentives do affect firms accounting choices
Hayn and Hughes (2006)	Determinants of goodwill write-offs	1276 acquisitions made by US listed firms	1988-1998	Write-off	ROA, operating losses, sales, competitive environment and returns	Regression model	The characteristics of the original acquisitions are more powerful predictors of eventual goodwill write-offs than those based on segment disclosures of the acquired entities' performance. Goodwill write-offs lag behind the economic impairment of goodwill by an average of three to four years
Masters-Stout et al. (2008)	Association between goodwill impairment and CEO temature	990 US listed firm-years	2003-2005	Goodwill impairment	CEO tenure, goodwill, net income, losses	Regression models	New CEOs impair more goodwill than their senior counterparts
Zang (2008)	Transitional goodwill impairment loss discretion and market reaction	870 US firms	2001-2003	Goodwill impairment	Industry, size, goodwill, returns, ROA, leverage and change in key management	Regression models	Some evidence of discretion to avoid violation of debt covenants and to take a "big bath". Stock return is negatively associated with an unexpected impairment
Godfrey and Koh (2009)	Whether goodwill impairment write-offs reflect firms' investment opportunities	575 US listed firm-years	2002-2004	Goodwill impairment	Investment opportunities, size, leverage, ROA, return, year	Ordinary least squares regressions	Strong negative association between firms' investment opportunities and the amount of goodwill impairment
Verriest and Gaeremynck (2009)	Determinants of goodwill impairment decisions and their disclosure quality	47 EU listed firm-years	2005-2006	Goodwill impairment	Ownership concentration, corporate governance quality, firm performance	Regression model	Firms with stronger corporate governance mechanisms are more likely to impair. Ownership structure and governance have a weak impact on the degree of impairment disclosure
Carlin and Finch (2010)	Discount rate discretion in goodwill impairment	124 Australian and New Zealand listed firms	2007	Discount rates disclosed		Empirical archival approach	Opportunistic exercise of discretion to avoid unwanted impairment losses is reported
AbuGhazaleh et al. (2011)	Manager's discretion in determining goodwill impairment losses	528 UK listed firms	2005-2006	Goodwill impairment	Book to market, goodwill, number of cash-generating units, turnover, operating cash flows, ROA, leverage, big bath and income smoothing proxies, management change, corporate governance, listed, year, size	Multivariate pooled tobit regression	Managers are exercising discretion, but effective governance mechanisms are likely to restrict managers' ability to report goodwill impairments that differ from predicted economic losses

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Gu and Lev (2011)	Cause of goodwill write-offs	54218 US publicly traded firm-years	1990-2006	Buyers' overpriced shares	Goodwill, goodwill write-offs, acquisition intensity and future performance	Quintiles classifications and logit analyses	A major cause of goodwill write-offs is the overpriced shares and it provides managers with strong incentives to exploit mispricing
Hamberg et al. (2011)	Economic incentives of the impairment decision	1691 Swedish listed firm-years	2001-2007	Goodwill amortisation and goodwill impairment	Goodwill, size, book value of equity, debt, CEO, ROE	Tobit model	Tenured management is negatively associated with the impairment decision. Investors seem to have viewed the accrual-based increase in earnings stemming from IFRS 3 as an indication of higher future cash flows
Detzen and Zülch (2012)	Manager's discretion: association between CEOs' bonuses and the recognition of goodwill	123 EU acquisitions	2005-2008	Goodwill	CEOs' short-term cash bonuses, synergy, book-to-market value, industry, stock, size, year, institutional cluster of the country dummies, interest	Regression models	The more CEOs' cash compensation packages depend on cash bonuses, the more goodwill is recognised in the acquisition
Ramanna and Watts (2012)	Management discretion	124 US listed firms	2003-2006	Goodwill impairment	Private information motive, contracting motive, reputation motives, valuation motive, reporting flexibility, control variables	Multivariate regression	While consistent with some agency-theory based predictions (CEO compensation and reputation and debt-covenant violation concerns), it does not confirm the private information hypothesis
Swanson et al. (2013)	Goodwill impairment charges of US firms VS non-US firms	688 US and 36 non-US firms	2003-2004	Goodwill impairment	Size, goodwill, stockholder's equity, ROE and earnings	Logit models	Firm-level and country-level characteristics affect the goodwill impairment decision
Iatridis and Senflehner (2014)	Goodwill impairments determinants	57 Australian non-financial listed firms	2006-2011	Goodwill impairment	New CEOs, CEOs in early tenure, goodwill, net income, cost of capital, Big 4	Ordinary least squares regressions	CEOs do not adopt goodwill impairment-related opportunistic behaviours. Firms that have carried out goodwill impairment tend to display higher cost of capital. Firms that report goodwill and are audited by a Big 4 auditor tend to display lower cost of capital
Abdul (2015)	Determinants of goodwill impairments	1911 Malaysian listed firm-years	2006-2010	Goodwill impairment	Sales, earnings, cash flows, book-to-market ratio, goodwill, debt ratio, change in CEO, big bath and earnings smoothing proxies	Tobit regression	Reporting incentives play an important factor in the reporting of goodwill impairment losses. Increased ownership by the largest outside shareholder is associated with increased shareholder monitoring of the managers' "big bath" reporting
Avallone and Quagli (2015)	Goodwill impairment management	354 EU listed firm-years	2007-2011	Goodwill impairment	Price-to-book value at the year end, cost of capital, growth ratio used in the impairment test, size, leverage, ROA, change in CEO, goodwill	Tobit, logistic and ordinary least square regressions	Growth rate manipulation is a significant explanatory variable in avoiding or reducing the amount of impairment write-off. Goodwill write-offs is negatively related to ROA, and positively to the disclosure level
Filip et al. (2015)	Earnings management	23331 US firm-years	2003-2011	Impairment avoidance	Discretionary expenses, level of production, cash flows, capital expenditures, accruals earning, suspect, market-to-book ratio, size, sales, leverage, Big 4, year, industry	Regression models	Manipulation is a tool used to support the non-recognition of economic impairment
Giner and Pardo (2015)	Behaviour of managers making goodwill impairment decisions	118 Spanish listed firm-years	2005-2011	Goodwill impairment	Leverage, big bath and smooth behaviour, goodwill, ROE, returns, market value of equity, expected goodwill impairment, size, Big 4 auditor and industry	Ordinary least square model	Managers exercise discretion in the reporting of goodwill impairment losses
Al-Hiyari et al. (2016b)	The influence of CEO tenure on goodwill impairment	727 Malaysian listed firms	2011-2012	Goodwill impairment	Goodwill, ROA, loss, new CEO,	Tobit regression	New CEO is associated with a greater magnitude of impairments only when earnings are positive
Banker et al. (2016)	Effects of multiple impairment indicators in conservative financial reporting	54910 US firm-years (8,028 firms)	1987-2007	Earnings, write-downs and goodwill impairment	Stock return, operating cash flows and sales	Timeliness models	Earnings exhibits asymmetric timeliness: The impact of stock return is greater for impairment of goodwill, whereas cash flow and sales changes play a greater role in write-downs of tangible assets
Kabir and Rahman (2016)	The role of corporate governance in the accounting discretion of goodwill impairment	1783 Australian listed firm-years	2007-2012	Goodwill impairment and goodwill impairment loss	Sales growth, operating cash flows, pre-impairment earning, industry ROA, book-to-market ratio, gross domestic product, lagged goodwill impairment loss, leverage, size, CEO, number of segments, industry, years	Logit and tobit regressions	Stronger governance enhances the associations between economic factors and goodwill impairment. Strong governance cannot completely eliminate the opportunistic use of discretion in an impairment decision, especially when pre-impairment income is negative, and when the impairment occurs in the first year of a CEO's tenure
Korosec et al. (2016)	Earnings management of goodwill impairment	188 Italian publicly traded firm-years	2008-2010	Goodwill impairment	CEO change, management's compensation, debt ratio, big bath and smoothing proxies, asset impairments, cash generating units, goodwill, ROA, sales, net income, cash flows, assets, market-to-book ratio, buy & hold return	Logistic regression model	Some incentives exist, while recognising the impairment losses of goodwill

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Saastamoinen and Pajunen (2016)	Goodwill impairment management	116 Finnish listed firms	2005-2009	Goodwill impairment and goodwill impairment amount	CEO change, management's compensation, stock turnover, goodwill impairment propensity, ROE, leverage, size, ROA, crisis, ownership, sector	Logit and FE ordinary least square regressions	Goodwill impairment losses are associated with managerial discretion and firms that face more market monitoring are more likely to recognise goodwill impairment losses
Sapkauskienė et al. (2016)	Goodwill impairment management	17 Baltic listed firms (207 observations)	2005-2013	Goodwill impairment and goodwill impairment amount	Change of managers, earnings, debts, size, goodwill, crisis, sales, operational cash flows, ROA, market value, balance sheet, gross domestic value	Binary logistic and linear regressions	Firms are inclined to delay goodwill write-offs and to recognise goodwill impairment losses under the most favourable circumstances
Sun (2016)	Managerial ability on goodwill impairment.	30426 US firm-years	2002-2011	Goodwill impairment	Unverifiable net assets, debt covenant, listed, market-to-book ratio, asset pricing concerns, share price, managers' information, ROA, goodwill, other items	Regression model	Managers with greater ability play an important role in preventing or reducing goodwill impairment
Vogt et al. (2016)	The determinants of goodwill impairment loss recognition	91 Brazilian listed firm	2011-2014	Goodwill impairment	Leverage, change in management, book-to-market, cash generating unit, revenues, cash flows, ROA, goodwill	Logistic regression with panel data	Incentives for earnings management practices exist
Abdul (2017)	Goodwill impairment incentives	52 Singaporean listed firms	2010-2012	Goodwill impairment	Leverage, CEO tenure, ownership concentration, audit committee independence, cash flows, size, goodwill and book-to-market ratio	Binary logistic regressions	Firms that are approaching violation of their debt covenants have a higher likelihood of exercising the recognition choice, while a higher proportion of audit committee independence constrains this choice (debt hypothesis)
Ferramosca et al. (2017)	Impact of external auditor on goodwill write-offs	1038 US observations	2003-2007	Big 4 auditor	Audit fees, non-audit services, auditor's tenure, goodwill, ROA, market-to-book value, size, leverage, industry and year	Regression model	The difficult to audit SFAS 142 provides incentives for auditors to deliver lenient audits
Kim and Bay (2017)	Goodwill impairment management: agency theory and cognitive dissonance	2274 US firm-years	2004-2011	Probability of a goodwill write-off	Goodwill write-off in previous year, buy and hold returns, earning, net income, cash flows, big bath, change in CEO, other write-offs and year	Binary logistic regression	Cognitive dissonance explains management behaviour with respect to record an impairment of goodwill at least as well as agency theory. Thus, no one theory can be expected to explain the behaviour of all managers for all decisions
Chen et al. (2018)	Efficiency of the acquisition decisions	1307 US mergers & acquisitions of publicly listed firms	1983-2009	3-day cumulative abnormal returns, ROA and financial statement comparability measure	Acquirer characteristics and target characteristics (size, leverage, Tobin' Q, ROA, cash flows, stock returns, ownership) and deal characteristics	Regression models	Acquirers make more profitable acquisition decisions when target firms' financial statements are more comparable: goodwill impairments and divestitures are less likely
Glaum et al. (2018)	Determinants of goodwill impairment	9,468 listed firm-year observations from 21 IFRS countries	2005-2011	Goodwill impairment	Stock market return, lagged stock market return, CEO's compensations, change in CEO, earnings smoothing and big bath proxies, leverage, Big4, equity shares held by institutional investors, equity shares freely available, n°. Analysts that follow a firm, goodwill, segments, years with goodwill impairments, ROA, size, market value to book value, risk, country, industry, year	Logistic regression model	Goodwill impairment incidence is negatively associated with economic performance, but also related to proxies for managerial and firm-level incentives. The timeliness of goodwill impairments and the degree to which goodwill impairment decisions are influenced by incentives depend on the strength of national accounting and auditing enforcement systems.
Gros and Koch (2019)	Determinants of goodwill impairment	2,485 European listed firm-years	2007-2013	Goodwill impairment	Stock return, ROA, analysts' forecasts, profit warning, losses, cash flows, market-to-book value, national gross domestic product growth rate, size, leverage, segments, year	Ordinary least squares panel regression	Goodwill impairment losses are used opportunistically rather than informatively. Managers exploit their discretion to "clear the deck" and to meet or beat analysts' forecasts. However, the opportunistic behaviour is constrained by corporate governance and enforcement mechanisms

Table E. Main empirical studies regarding goodwill and goodwill impairment disclosures (research line 5).

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Sevin et al. (2007)	Whether financial disclosures are transparent and whether the adequacy of these disclosures is impacted by firm size	120 US firms stratified by size	2002	Goodwill and goodwill impairment disclosures		Descriptive analysis	Many firms are not willing to provide additional voluntary disclosures, despite having the necessary information easily accessible. Compliance with the provisions of SFAS 142 was sporadic and unpredictable
Shalev (2009)	Causes and effects of business combinations disclosure level	1019 US business combinations	2001-2004	Disclosure level on business combinations	Acquirers' future performance (measured by the change in ROA and by abnormal	Disclosure score and regression model	Disclosure level is positively associated with acquirers' performance and decreases with abnormal goodwill. Investors do not seem to understand the information content

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
					stock returns), industry, growth forecast of the acquirer		
Carlin et al. (2010)	Goodwill impairment disclosure level	168 Singaporean listed firms	2005-2007	Disclosure requirement of IAS 36		Checklist of requirements	Poor compliance across many facets of goodwill impairment testing disclosures
Carlin and Finch (2011)	Goodwill impairment practice and compliance level	200 Australian listed firms	2006	Disclosure requirements of IFRS level		Checklist of requirements	Systematic non-compliance with goodwill impairment disclosures and deficiencies in the technical procedures
Biancone (2012)	Financial information about goodwill impairment test	543 Italian listed firm-years	2007-2009	Goodwill and goodwill impairment disclosures		Disclosure index	The disclosure provided by no means appears exhaustive and complete
Camodeca et al. (2013)	Disclosure level of the goodwill impairment	85 UK large listed firms	2007-2011	Disclosure level of the goodwill impairment		Percentage analysis of the key assumptions	There is a lack of disclosure, especially after the world economic and financial crisis
D'Alauro (2013)	The quality of goodwill impairment disclosure and its relationship with goodwill write-offs and earnings performance	59 Italian firm-years and 51 British firm-years	2006-2008	Level of goodwill impairment disclosure	Magnitude of goodwill write-offs and earnings performance	Unweighted disclosure index and, univariate and multivariate analyses	Insufficient information. Only Italian firms show a positive association between the level of mandatory disclosure and both the magnitude of goodwill write-offs and earnings performance
Glaum et al. (2013)	Compliance with required disclosure and reporting incentives	357 EU firms	2005	IFRS compliance level	Company-specific reporting incentives and country-specific variables	Labelled checklist and regression models	Substantial non-compliance. Accounting traditions and other country-specific factors play a role in compliance levels
Guthrie and Pang (2013)	Disclosure of goodwill impairment	287 Australian listed firms	2005-2010	Level of disclosures in the financial report		Archival-based research	Compliance with the Standard's goodwill allocation requirements generally improved; however, there was still non-compliance for all reporting periods
Izzo et al. (2013)	The level of disclosure on impairment test of goodwill and the impact of the financial crisis	177 observations of Italian listed firms	2007-2011	Level of goodwill impairment disclosure	Impairment rate, goodwill and market capitalisation	Disclosure index	The quality of disclosure is still incomplete, even if it is clear that there is a significant improvement in the period covered
Khairi et al. (2013)	The compliance level and disclosure quality of goodwill impairment	Top 20 of Singaporean listed firms	2007	Information disclosed on goodwill impairment process under the FRS 36		Weighted index	90% of firms in Singapore failed to comply with the most basic elements of the FRS 36 pertaining to goodwill impairment testing
Bepari et al. (2014)	The impact of the global financial crisis on firms' compliance for goodwill impairment testing	916 Australian firm-years	2006-2009	Compliance and disclosure with the mandated issues	Crisis, goodwill intensity, industry, size, profitability, leverage and Big 4	Compliance/disclosure index and regression models	Firms' compliance has increased during the global financial crisis. Goodwill intensity, size, audit quality and profitability are associated with firms' compliance
Bepari and Mollik (2015)	Effect of audit quality on firms' compliance with IFRS for goodwill impairment testing and disclosure	911 Australian listed firm-year	2006-2009	Level of compliance and disclosure	Big 4 auditors and firms' audit committee members' accounting and finance backgrounds	A compliance index and multivariate regressions	Big-4 auditors enforce higher compliance and audit committee positively affects firms' compliance
Maratno (2015)	Factors of goodwill disclosure level	83 Indonesian listed firms	2011	Goodwill disclosure level	Contract motives (debt covenant, manager bonus, dual listing), CEO reputation, size	Disclosure score and regression analysis	Information related to goodwill is minimal. The determinant factors of goodwill disclosure level are contract motive and reputation motive
Carvalho et al. (2016b)	The magnitude of goodwill recognised and the level of compliance	197 Portuguese business combinations	2005-2009	Ratio of goodwill to the acquisition cost and main disclosure requirements		Percentage analysis of the main items of disclosure	High amounts of goodwill. Firms do not undertake sufficient efforts to individually identify intangibles acquired in business combinations and the level of compliance is low
Mazzi et al. (2017)	Compliance levels of goodwill disclosure and their association with firms' implied cost of equity capital	831 EU firm-years	2008-2011	Disclosure requirement and cost of equity capital	Factor associated with firms' implied cost of equity capital	Disclosure checklist and ordinary least square regression	Differences in compliance levels across firms and time. Negative relationship between the cost of equity capital and compliance with mandated goodwill-related disclosure
Mazzi et al. (2018)	Effect of corruption and culture on goodwill disclosures	779 European listed firm-years	2008-2011	Goodwill disclosure level	Corruption level and cultural country traits	Disclosure index and ordinary least squares regressions	Compliance levels vary significantly across sample firms, countries and over time. Firms rarely comply with mandated disclosure in full. Additionally, higher levels of perceived corruption in a country and higher values of the Hierarchy (Mastery) dimension are associated with lower (higher) compliance levels and their changes over time
Chen et al. (2019)	The association between disclosures about the fair value measurement of goodwill and audit fees	3492 firm-years from 500 U.S. listed companies	2004-2014	Audit fees	Disclosure score regarding the fair value measurement process of goodwill impairment testing, goodwill, segment, SIC codes, R&D expenditure, goodwill impairment, size, debts, liquidity, inventory, foreign operation, ROA, loss, sales growth, pension plan, book-to-market ratio, Big4	Regression models	Goodwill-related disclosures are positively related to audit fees (audit effort and litigation risk).
Kabir et al. (2020)	The relation between firm life cycle and goodwill impairment disclosure	1,807 Australian listed firm-years	2007-2012	Goodwill impairment test-related disclosure index	Firm life cycle, size, goodwill, book-to-market ratio, goodwill impairment loss,	Regression models	Disclosures vary across firms, firm life cycle stages and industries. We also find that disclosures vary by disclosure items and the differences in disclosures between stages are

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
					ROA, leverage, shares held, governance index		more pronounced for some disclosure items than for others

Table F. Goodwill initial recognition and purchase price allocation (research line 6).

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Grinyer et al. (1991)	Management behaviour assigning values to net tangible assets and to goodwill	392 UK listed firms	1982-1986	Goodwill written off	Acquisition price, merger relief provision and gearing level	Ordinary least square model	The acquisition price assigned to goodwill is negatively related both to post-acquisition gearing and to the size of the price paid for the acquiree relative to the post-acquisition market value of the acquirer and positively associated with the availability of merger relief reserves
Gore et al. (2000)	Management preferences: immediate write-off or capitalisation-based approaches	212 UK listed firms (finance directors)	1994	Immediate write-off or capitalisation-based approaches	Gearing level, interest cover ratio, management compensation scheme, US quote, London Stock Exchange Class 1 transactions, sector, sales and risk	A survey and logistic regression model	Results support certain contracting cost-based hypotheses and changes in market perceptions constitute a strong influence on the preferences
Bloom (2009)	New accounting treatment for goodwill	20 Australian listed firms	1999-2002	Purchased and internally generated goodwill	Net tangible assets, identified intangible assets and market capitalisation	“Method of construction”	A Market Capitalisation Statement feasible, simple and not costly to produce and it yield useful information
Comiskey et al. (2010)	Whether negative goodwill is valued	43 US observations	2000-2007	Returns and negative goodwill	Size, cash deal and market-to-book ratio	Regression models	The results do not provide compelling evidence that markets value negative goodwill
Giuliani and Bränström (2011)	Discussion on the concept and nature of goodwill	138 Italian and 170 Swedish listed firms	2005-2006	How firms describe their purchased goodwill		Text scrutiny with descriptive analysis of frequencies	Firms refer to goodwill as a residuum but a number of firms do supply a description of goodwill. No predominant behaviour is found that is useful to construct a practice-based definition: goodwill appears to be unclear in practice
Kung et al. (2013)	The determinants of the allocation of takeover purchase price	35 successful Australian acquisitions	1988-2004	The percentage of the takeover purchase price allocated to identifiable intangible assets	Pre-bid dividend pay-out ratio and control variables (ROA, debt, investment opportunity, auditor quality, audit fees, successfully acquisitions)	Tobit regression	No significant association between the acquirer’s pre-bid dividend pay-out ratio and the percentage of takeover purchase price later allocated towards identifiable intangible assets
Shalev et al. (2013)	The impact of CEO compensation on the purchase price allocation	320 acquisitions on SDC	2001-2008	Goodwill	CEO bonus intensity, target characteristics (target’s industry, unrecognized identifiable intangible assets, fixed assets, recognized intangibles), book-to-market ratios, industry, expected synergies, the cost of overstating goodwill, mode of payment, acquirer’s CEO holdings	Ordinary least squares and two-stage least squares regressions	Earnings-based bonuses are more likely to overallocate the purchase price to goodwill. When the acquirer’s CEO bonus plan includes performance measures that are not affected, or are less affected, by the overstatement of goodwill, such as cash flows, sales, or earnings growth, the overallocation to goodwill motivated by bonus plans diminishes
Zhang (2013)	The impact of internally generated goodwill on financial performance	84515 US firm-years	1991-2010	Market value of equity	Book value of equity, internally generated goodwill, financial ratios	T-student test, logit and probit regressions	Firms with positive internally generated goodwill have significant better financial performance than those with negative internally generated goodwill
Bugeja and Loyeung (2015)	Purchase price allocations	308 Australian publicly listed firms	1998-2012	The amount allocated to acquired goodwill	Contractual incentives, bidder firm leverage, CEO bonus plans, Big 4, size of the target, equity ownership, friendly takeover, premium, industry, other economic characteristics	Regression model	Managers use their discretion when conducting purchase price allocations and the amount allocated to goodwill also increases after IFRS
Paugam et al. (2015)	The informativeness of purchase price allocations	308 U.S. observations	2002-2011	Goodwill, acquirer’s cumulative abnormal returns	Determinants of expected goodwill, goodwill, the number of disclosed purchase price allocations, materiality, other characteristics of the purchase price allocations	Ordinary least square models	PPAs are informative for investors and the level of goodwill is informative about the quality of the acquisition and is an early indicator of future impairment and change in performance.
Su and Wells (2015)	Accounting practices for identifiable intangible assets	1015 Australian takeovers for observations	1988-2008	Firm performance	Identifiable intangible assets, goodwill, IFRS, earnings, market value, leverage, industry, method and size	Regression model	No association between identifiable intangible assets acquired and firm performance, either before or after IFRS. No reason for distinguishing between acquired and internally generated and revalued identifiable intangible assets
Xiao and Liu (2016)	The impact of goodwill on the profitability of the firm	70 Chinese listed firms	2008-2012	ROA	Goodwill, fixes assets, intangible assets and index	Panel data model	Goodwill can improve profitability
Zhang and Zhang (2017)	Purchase price allocations	98 US acquisitions	2001-2005	Percentage of the Price allocated to goodwill	Age of CEO, CEO tenure, book value of equity, verifiable net assets, number of reporting segments, size, earnings, debt	Ordinary least square model	The allocation of purchase price is related to the economic determinants of the valuation, but also to managerial incentives arising from the differential treatments of goodwill and

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Frii and Hamberg (2021)	The motives shaping the initial accounting for goodwill	1,112 acquisition reported by Swedish listed acquiring firms	2005-2013	Goodwill at the acquisition date	covenant, litigation risk, target characteristics CEO's compensation, ownership, purchase price, acquisition experience, acquisition uncertainty, ROA, debt, liquidity, concentration of power, dual classes shares	Regression models	identifiable intangible under SFAS 142. This managerial discretion is not exhibited prior to SFAS 142 No evidence that earnings-based compensation affects the proportion of the purchased price accounted for as goodwill. When a family-owned firm is the acquirer, a larger proportion of the purchase price is accounted for as goodwill than as specific assets and liabilities. Overall, the motives shaping goodwill accounting choices depend on the institutional setting

Table G. Other studies regarding goodwill accounting practices and preferences (research line 7).

Study	Research objective	Sample	Period	Target variable	Other variables	Main analysis	Major findings
Carlin and Finch (2009)	Bias in the selection of discount rates	105 Australian firms	2006	Discount rates		Empirical archival approach	Inappropriate discount rates are being employed in the impairment testing processes
Petersen and Plenborg (2010)	How firms implement impairment tests as required by IAS 36	62 Danish firms (person in charge of impairment testing)		Questionnaire that focuses on identifying a cash generating unit and measuring its recoverable amount	Firm size, magnitude of goodwill, other experience with valuation, manual impairment testing procedures	A survey-based analysis and multivariate analysis	There are inconsistencies in the implementation of IAS 36, but they are less likely in firms that systematise the procedures for impairment testing and use persons with considerable valuation experience
Ji (2013)	The timing of goodwill impairment decisions	77 Australian listed firms	2007-2009	ROA		Percentage analysis	Goodwill impairment is delayed and avoided
Pajunen and Saastamoinen (2013)	Auditors' perceptions of goodwill accounting	123 KHT certified Finnish auditors	2011	Valuation issues, managerial position, manipulative behaviour and market monitoring		An electronic questionnaire survey	Polarised opinions: some consider that goodwill impairment charges are not always taken and others, Big 4, are more favourable toward new valuation methods in goodwill accounting
Visvanathan (2017)	Association between audit fees and the proportion of recorded intangible assets	29960 US firm-years	2010-2015	Audit fees	Intangible assets, size, ROA, loss, leverage, extraordinary items, industry, year, audit complexity, client's accounting risk, audit quality, auditor tenure and auditor's capacity constraint	Regression models	Auditors charge higher fees for firms with higher proportion of intangible assets on the balance and even higher for firms with potential impairment concerns
Ferramosca and Allegrini (2021)	Analysis of CFO perception of adopting a goodwill impairment-only approach compared to an amortization model	352 chief financial officers	2016	CFO preference between impairment-only approach or goodwill amortization model	CFO expertise and experience, CFOs' perceptions of write-offs and external auditors, firms' capital structures, firms' optimistic accounting culture, size, goodwill to total assets, listed firms, Big4, party that carries out the impairment test, standard, CFO gender, industry and country	A survey and logistic analysis	Overall CFO prefer goodwill impairment testing. Characteristics on an individual (CFO characteristics and perceptions), firm (ownership structure) and country (optimistic accounting cultures) affect preference for goodwill accounting model



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