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ORIGINAL ARTICLE

Timeliness of goodwill impairment in Brazilian companies

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ABSTRACT

This article aimed to examine the timeliness of goodwill impairment perceived by the Brazilian capital market. Despite it being widely studied internationally, the timeliness of goodwill impairment has not yet been empirically investigated in Brazil, given that previous studies focus on the determinants of this loss, on its disclosure, or on manager behavior. This question is relevant primarily due to the context of standardization of the International Accounting Standards Board (IASB), which has discussed possibilities for altering the treatment of goodwill. It is also important for investors, since a lack of timeliness affects the utility of accounting information for these users. The study provides indications that the discretion of the impairment test is used opportunistically, altering the moment of recognition of a goodwill loss. This shows the need for a joint effort between monitoring agents and standard-setting bodies to guide the use of discretion, as well as changes in manager behavior. It also indicates that the current rule for recording impairment fails in providing timely information, as it provides a shielding effect against losses. The study used non-financial companies listed on the B3 S.A. – *Brasil, Bolsa, Balcão* that had goodwill recognized in the 2010-2020 period. The analysis considered two dependent variables, applying a logistic regression to explain the recognition or not of goodwill impairment and a tobit model to predict its value. To examine timeliness, the current and lagged annual returns on shares were used. The findings suggest that losses through goodwill impairment are not recognized in a timely manner and that managers delay recording them by at least one to two years, with stronger indications of late recognition in two years. In addition, the loss amount can be influenced by returns occurring up to three years before its recording.

Keywords: impairment losses, goodwill, timeliness, capital market, discretion.

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1. INTRODUCTION

This article aims to examine the timeliness of goodwill impairment perceived by the Brazilian capital market.

In business combinations, goodwill should be recognized in intangible assets whenever the acquirer transfers a greater consideration than the fair value of the acquiree's net assets [International Financial Reporting Standards 3 (IFRS 3)]. After 2004 – the period up to which goodwill was amortized – the International Accounting Standards Board (IASB) determined that this goodwill should be tested only by its recoverable amount at least annually, following International Accounting Standard 36 (IAS 36) – Impairment of Assets. For the IASB, this approach would provide more useful information for investors than the amortization system, which has been corroborated by studies that indicate the greater value relevance of the impairment approach for the capital market (AbuGhazaleh et al., 2012; Horton & Serafeim, 2010; Knauer & Wöhrmann, 2016).

On the other hand, the system of the test for reducing the recoverable amount for goodwill gives managers broad discretion, which can be used opportunistically to manipulate its recognition or to communicate private information to the market (Li & Sloan, 2017; Ramanna & Watts, 2012). In this sense, studies present evidence that the discretion is exercised opportunistically by managers to delay the recognition of impairment, meaning that this loss is not recognized in the timely way, especially in countries where public enforcement is weak (Albersmann & Quick, 2020; Filip et al., 2021; Glaum et al., 2018).

Consistently with this lack of timeliness, the IASB itself, through the publication of a document on the post-implementation review of IFRS 3 in 2015, identified that reductions in the value of goodwill are not always recognized in a timely manner and that the impairment test for this asset is expensive and complex. For that reason, the body began a research project on goodwill and impairment that resulted in the publication of discussion paper DP/2020/1 (IASB, 2020) on Business Combinations – Disclosures, Goodwill, and Impairment. This DP discusses, among other questions, the effectiveness, cost, and complexity of the goodwill impairment test and whether amortization should be reintroduced.

With relation to the effectiveness, the key question is that losses would be recognized too late, a long time after the events that caused them. This lack of timeliness could occur due to manager optimism or because of limitations of the standard itself. On one hand, managers may use optimistic assessments in the assumptions of the test for reducing the recoverable value in order not to recognize the goodwill loss during a period, delaying its recognition (Filip et al., 2021). On the other, the standard itself may delay the recording of the loss, since the test applied to a cash generating unit (CGU) provides a shielding effect against goodwill losses, due to the excess in its recoverable amount (headroom).

Thus, the empirical question is whether the impairment test reflects the decrease in the amount of goodwill in a timely way. This question is important for standard-setting bodies, contributing to the current discussion in the IASB about goodwill impairment. It is also relevant for investors, since the timely recognition of a goodwill loss can improve the utility of accounting information, as timeliness is an enhancing qualitative characteristic. Finally, the study also contributes to managers' decisions as it provides evidence that can encourage them to cancel poor investments earlier (Albersmann & Quick, 2020).

This research fills a gap in relation to the timeliness of goodwill impairment in the Brazilian context, since national studies focus on the determinants of this loss (Alves & Silva, 2020; Pacheco et al., 2017; Vogt et al., 2016), on its disclosure (Barbosa et al., 2014; Feitosa et al., 2017; Souza et al., 2014), or on manager behavior (Cappellesso et al., 2017; Garcia et al., 2020; Moura et al., 2019). It also advances the study of Cappellesso et al. (2018), who identify that the market does not react to the recognition of this loss, but it does not identify a reason for this.

2. THEORETICAL FRAMEWORK

Following the IASB, Brazil adopted the approach of testing for reductions in the recoverable amount of goodwill as of 2009, with the issuance of Accounting Pronouncements Committee 15 (CPC 15) – Business Combinations. Thus, companies should carry out the impairment test at least annually and whenever there is internal or external evidence of devaluation, recognizing the loss when the book value exceeds the recoverable value of the CGU to which the goodwill belongs (following CPC 01 – Impairment of Assets).

This implies a high degree of discretion in this test, primarily because estimating the recoverable value of

the CGU of the goodwill involves an assessment model that requires unverifiable assumptions (Ramanna, 2008; Ramanna & Watts, 2012). Specifically, since it is not possible to evaluate the fair value of goodwill separately, the recoverable amount will normally be the value in use, which involves judgment on various points, such as on the assets that compose the CGU, on the evidence of devaluation, and on the estimation of future cash flow, of the growth rate, and of the discount rate (Carlin & Finch, 2009; Niyama et al., 2015).

Such discretion can be used efficiently by managers, in order to communicate private information about the company's future performance, or opportunistically, altering the moment or value of the impairment loss (Abughazaleh et al., 2011; Ramanna & Watts, 2012). With relation to the moment of recognition, companies can delay, accelerate, or not recognize the loss from goodwill impairment, affecting the timeliness of this information for investors (Glaum et al., 2018; Ramanna, 2008; Ramanna & Watts, 2012).

Managers have incentives to delay or avoid goodwill impairment, in order to temporarily overestimate the value of that asset, of earnings, or of share prices, primarily because this loss would signal a failed investment strategy and a decline in the company's performance (Bartov et al., 2020; Gu & Lev, 2011; Sun, 2016). Thus, to delay the recognition of this loss, managers can use their discretion in order to inflate the recoverable amount of the CGU of the goodwill, whether through optimistic assessments regarding the growth or discount rate, or through cash flow management (Carlin & Finch, 2009; Filip et al., 2021).

Various studies find evidence consistent with managers delaying or avoiding the recognition of losses from goodwill impairment. This is observed, for example, by Beatty and Weber (2006), Li and Sloan (2017), Li et al. (2011), and Ramanna and Watts (2012) in the American context of the Statement of Financial Accounting Standards 142 (SFAS 142). In turn, within the scope of the international accounting standards, research conducted in Germany (Albersmann & Quick, 2020), Australia (Ji, 2013), and South Korea (Choi & Nam, 2020) also provides evidence that losses from goodwill impairment are not recognized in an entirely timely manner by companies.

Studies that jointly analyze multiple countries converging with the IFRS also indicate that lack of timeliness in the decline of goodwill. Glaum et al. (2018) verify that, although companies with worse economic performance have a greater probability of recognizing goodwill impairment, they do not do so in an entirely timely way. For the authors, this may reflect both managers' economic incentives to delay impairment as well as the shortcomings in the application of the accounting and auditing rules at a national level. Consistently with that, Filip et al. (2021) and Glaum et al. (2018) found that companies from countries with high enforcement have more chances of recognizing goodwill losses in a timely manner than companies located in countries with low enforcement.

In Brazil, however, the studies do not directly evaluate the timeliness of goodwill impairment from a capital market viewpoint, but rather they present evidence that the decision to recognize this loss is associated with management incentives linked to the timing of recognition. For example, national studies observe that big bath accounting, a type of manipulation to delay possible poor results, is a determinant of the recognition of impairment losses, which would indicate that managers may accelerate a goodwill loss in order to present higher earnings in the future (Alves & Silva, 2020; Cappellesso et al., 2017; Pacheco et al., 2017).

Similarly, when studying the determinants of goodwill impairment in the Brazilian context, Vogt et al. (2016) observed that the losses were determined by management incentives such as a change in management. As the authors explain, companies that change managers may present a tendency to disclose greater losses, attributing their cause to the poor decisions of their predecessors, in order to reduce future losses.

Finally, based on the above and on the empirical evidence, the hypothesis takes into consideration that the discretion present in CPC 01 – Impairment of Assets (which follows IAS – 36) – enables managers to manipulate the moment of recognition of a loss from goodwill impairment, affecting the timeliness perceived by the capital market. In addition, as Brazil is considered to be a code law country (La Porta et al., 1998), characterized by a low level of enforcement and weak investor protection, the importance of timeliness would be less emphatic (Knauer & Wöhrmann, 2016). Therefore, the study hypothesis is:

> H_1: goodwill impairment losses are not recognized in an entirely timely manner by Brazilian companies.

3. METHODOLOGICAL PROCEDURES

3.1 Variables and Econometric Model

To test the timeliness of goodwill impairment losses, model 1 is applied with two different dependent variables: one that consists of the recognition or not of a goodwill loss and the other that uses the amount of the loss. The independent variables used refer to a timeliness metric and other control variables known in the literature for influencing the recognition of goodwill impairment, as according to model 1:

$$GI_{i,t} = \beta_0 + \beta_1 RET_{i,t} + \beta_2 RET_{i,t-1} + \sum \beta_c Controls_{i,t} + \varepsilon_{i,t} \quad [1]$$

in which $GI_{i,t}$ is a dummy variable equal to 1 if company i recognized a goodwill impairment loss in year t, 0 otherwise, or the value of the loss of company i in year t scaled by lagged total assets, $RET_{i,t}$ is the annual return on the shares adjusted by dividends of company i in year t, $RET_{i,t-1}$ is the annual return on the shares adjusted by dividends of company i in the previous year, and $controls_{i,t}$ are the variables defined according to Table 1.

For the dependent variable that indicates the existence or not of goodwill impairment, a logistic regression was used due to its dichotomous nature. In turn, in the regression that considers the value of the loss from a goodwill impairment, the tobit model was applied. This choice is due to the nature of the dependent variable, which, as it includes companies that do not recognize any loss, ends up being censured to the left (by 0). The independent variables are the same in both regressions and are explained in Table 1.

Table 1
Description of the explanatory variables

Variables		Calculation	Explanation	Expected sign
Interest variables				
Financial performance	$RET_{i,t}$	Annual return on the shares of company i in period t calculated from nine months before to three months after the end of the fiscal year.	Share prices reflect, in a timely manner, information about the capacity of companies to generate cash flow. Thus, negative market performance indicates that the assets lost part of their capacity to generate future cash flows, and should be tested through impairment (Glaum et al., 2018).	(-)
	$RET_{i,t-1}$	Annual return on the shares of company i in period t-1 calculated from nine months before to three months after the end of the fiscal year.	Managers are reluctant to recognize impairment in a timely manner, with an association being manifested between lagged economic indicators and goodwill impairment in the current year (Glaum et al., 2018).	(-)
Control variables				
Economic performance	$BM_{i,t}$	BM ratio of company i in year t calculated as NE before impairment divided by the firm's market value.	The closer NE gets to the company's market value, the greater the likelihood of its assets being overvalued or no longer being fully recoverable (Vogt et al., 2016).	(+)
	$ROA_{i,t}$	Return on assets of company i in year t measured as net earnings before goodwill impairment over lagged total assets.	ROA captures the company's profitability, with it being expected that companies with good performance have greater protection against impairment and less likelihood of goodwill being reduced (Abughazaleh et al., 2011).	(-)
Company	$GW_{i,t}$	Goodwill before impairment of company i in year t scaled by lagged total assets.	Companies with greater goodwill have more chance of disclosing a loss because the amount of goodwill exposed to impairment is greater (Abughazaleh et al., 2011).	(+)
	$SIZE_{i,t}$	Size of company i in year t calculated as the natural logarithm of lagged total assets.	Bigger companies may be subject to greater public control and corporate governance, as well as having greater expertise and resources to execute impairment tests (Albersman & Quick, 2020).	(+)

BM = book-to-market; NE = net equity.
Source: *Elaborated by the authors.*

The test design is based on Albersmann and Quick (2020) and Glaum et al. (2018). Starting from Basu (1997), the timeliness of the losses from goodwill impairment is tested through their association with the returns on the shares, as this piece of data reflects all the publicly-available information that can provide timely news about the need

for impairment. In the case of goodwill, return has an even greater impact, as goodwill has a undefined useful lifespan and the returns on the shares reflect discounted cash flows over an infinite period (Banker et al., 2017). Thus, an association between goodwill impairment and current return on shares would indicate the timely recognition of that loss. However, as managers have incentives to delay impairment, lagged return is also included to test the lack of timeliness. The 2 x 2 matrix in Figure 1 shows how returns can be interpreted with regard to timeliness.

		Current return	
		Significant	Insignificant
Lagged return	Significant	1) Partially timely	2) Not timely
	Insignificant	3) Entirely timely	4) Insufficient evidence

Figure 1 *Interpretation regarding timeliness*
Source: *Elaborated by the authors.*

So as not to reject H_1, the evidence should be consistent with scenarios 1 and 2, that is, there only needs to be a negative and significant association between the loss from goodwill impairment and lagged return. It warrants mentioning that the calculation of return, estimated in the intra-announcements period, is developed in order to exclude the market's response to the results of the previous period, since the Brazilian legislation allows the statements to be published up to three months after the end of the fiscal year. This ensures that earnings information from the current year, including potential goodwill losses, is processed by the capital market participants (Albersmann & Quick, 2020).

Regarding the control variables, the main economic performance measures known in the literature are included as they influence the loss from a goodwill impairment, such as the book-to-market (BM) ratio and return on assets (Abughazaleh et al., 2011; Albersmann & Quick, 2020; Glaum et al., 2018; Vogt et al., 2016). However, the model does not control management incentives, especially those for manipulation of the timing of recognition (such as big bath accounting), since the timely recognition of losses represented by return already has an endogenous component related to the companies' incentives for disclosure (Dechow et al., 2010). Therefore, controlling these incentives would remove the timeliness effect sought.

3.2 Sample and Data Collection

To conduct the study, non-financial Brazilian companies listed on the B3 S.A. – *Brasil, Bolsa, Balcão* (B3) were used that had goodwill recognized during some year in the period from 2010 to 2020. The data start in 2010, as the requirement of the goodwill impairment test came into effect as of 2009, and the inclusion of this first year of adoption could affect the recognition of the loss (Albersmann & Quick, 2020). The exclusion of financial institutions is warranted due to (i) the submission of these entities to prudential regulation and supervision parameters that determine the activities of these entities and (ii) the characteristic of the business of financial intermediation having strong leverage as an assumption, which tends to produce accounting indicators that are not comparable with those related with non-financial entities.

The accounting variables were collected from the consolidated financial statements, with the data on goodwill impairment being collected manually from the footnotes on the B3 website and the rest of the accounting variables being obtained from Thomson Reuters. The return on shares data were collected from the Economatica database, as this enabled the calculation in the intra-announcements period.

Due to the calculation of return, the sample excludes companies that closed their fiscal year in a month other than December. In addition, observations of negative net equity and a market value equal to 0 are discarded, which would lead to a misleading BM. The stages of obtaining the sample can be visualized in Table 2, together with the number of annual observations of companies with goodwill and that recognized impairment losses.

Table 2
Composition of the sample with data in the period from 2010 to 2020

Panel A: Building of the study sample		
Stages	**n**	**%**
Companies listed on the B3 S.A. – *Brasil, Bolsa, Balcão*	382	-
(-) Financial sector	(71)	-
= Non-financial companies	311	100
(-) Companies without goodwill in the period	(146)	46.95
(-) Close of tax year different from December	(2)	0.64
= Final sample	163	52.41
Panel B: Number of companies with goodwill and impairment per year		
	Goodwill	**Impairment**
Year	**n**	**n**	**%**
2010	98	4	4.08
2011	105	8	7.62
2012	110	10	9.09
2013	113	14	12.39
2014	115	11	9.57
2015	119	16	13.45
2016	122	18	14.75
2017	133	13	9.77
2018	138	8	5.80
2019	136	11	8.09
2020	135	16	11.85
Total	1.324	129	9.74

Source: *Elaborated by the authors.*

The study sample totaled 163 firms, indicating that more than half of the non-financial companies listed on the B3 recorded goodwill in some year in the period from 2010 to 2020. Through detailing the period, we verify a generally increasing trend in the number of companies that recognized goodwill, totaling 1,324 company-year observations over the 11 years analyzed. The number of companies with a goodwill impairment loss in the period, however, is only 129, corresponding to fewer than 10% of the observations with goodwill. This number varies over the years, with an increasing trend up to 2016, a reduction up to 2018, and an increase again up to 2020.

As the loss from a reduction in the recoverable amount of goodwill depends on external evidence of devaluation, the Brazilian economic context may help to explain this variation. For example, the years 2015 and 2016, which saw the greatest number of goodwill losses, were marked by the Brazilian economic recession. In turn, in 2020, the increase in the number of recognized losses may be linked to the impact of the pandemic on the companies' economic activities.

4. RESULTS

4.1 Presentation of the Results

Table 3 presents the descriptive statistics of the variables used in the study.

Table 3
Descriptive statistics of the Brazilian companies with data from the period from 2010 to 2020

	n	Mean	Median	St. dev.	Min.	Max.	Shapiro-Wilk
GI_Dummy	1,294	0.100	0.000	0.300	0.000	1.000	0.000***
GI_Value	1,264	0.002	0.000	0.015	0.000	0.295	0.000***
RET_t	1,231	30.557	3.459	482.789	-95.204	16,683.53	0.000***
RET_{t-1}	1,193	30.343	2.385	487.403	-95.204	16,683.53	0.000***
BM	1,053	0.953	0.587	1.168	0.007	10.299	0.000***
ROA	1,263	0.046	0.045	0.119	-0.506	0.930	0.000***
GW	1,254	0.133	0.057	0.195	0.000	2.832	0.000***
SIZE	1,543	21.884	21.773	1.736	16.471	27.554	0.000***

BM = book-to-market ratio calculated as net equity before impairment divided by the firm's market value; GI_Dummy = equal to 1 if there is a loss from goodwill impairment and 0 otherwise; GI_Value = value of the loss scaled by lagged assets; GW = amount of goodwill before impairment in relation to previous total assets; RET_t = current annual return on shares adjusted by dividends; RET_{t-1} = lagged annual return; ROA = return on assets measured as net earnings before goodwill impairment over lagged total assets; SIZE = company size determined by the natural logarithm of lagged total assets.
**** = statistically significant at 1%.*
Source: *Elaborated by the authors.*

Of the total companies that had information on the goodwill impairment test, more than 90% did not recognize losses in the period, leading to a mean loss of only 0.24% in relation to total assets and a median equal to 0. However, when considering only the 129 companies that recorded losses, the impairment value corresponds to a mean of more than 16% of the goodwill amount and 0.7% of total assets (in non-tabulated analyses). Also, the value of that loss may be material, compromising up to 29.50% of lagged total assets, as observed through the maximum value.

With relation to the independent variables, a mean return of around 30% was observed, varying from -95 to 16,683. This, together with the standard deviation (SD), indicates a high spread around the mean and possible outliers. Regarding the BM, it was verified that, on average, the market value of the companies exceeded their book value (BM < 1). In addition, the median shows that for 50% of the companies their market value was at least 1.69 (1/0.59) times higher than their net equity (NE). Finally, the return on assets was around 4.46%, being closest to the median, while goodwill corresponded to more or less 13.26% of total assets, reaching a maximum of 283%. This occurs because the scaling of goodwill occurs in relation to total assets from the previous period, and may exceed them.

As many variables present minimum and maximum values relatively far from the mean and a high SD, the results may be influenced by potential outliers. To mitigate that effect, the outliers identified at the 1% extremes were excluded so that there are no excessive exclusions.

Regarding the data distribution, all the variables had a higher mean than the median, indicating that there is an asymmetric and positively distorted distribution for all. Thus, to obtain more evidence about the data normality, Table 3 presents the results of the Shapiro-Wilk test, which rejects the normality hypothesis. For that reason, the correlation test presented in Table 4 uses a non-parametric measure, the Spearman's rho.

Table 4
Spearman's correlation matrix

	GI_Dummy	GI_Value	RET_t	RET_{t-1}	BM	ROA	GW
GI_Value	0.998***	1.000					
RET_t	-0.054	-0.056*	1.000				
RET_{t-1}	-0.164***	-0.169***	0.137***	1.000			
BM	0.069**	0.073**	-0.305***	-0.352***	1.000		
ROA	-0.096***	-0.103***	0.310***	0.367***	-0.488***	1.000	
GW	0.078**	0.090***	0.004	-0.002	-0.203***	0.055*	1.000

Table 4
Cont.

	GI_Dummy	GI_Value	RET_t	RET_{t-1}	BM	ROA	GW
SIZE	-0.004	-0.014	0.0640*	-0.027	-0.059*	0.011	-0.168***

BM = book-to-market ratio calculated as net equity before impairment divided by the firm's market value; GI_Dummy = equal to 1 if there is a loss from goodwill impairment and 0 otherwise; GI_Value = value of the loss scaled by lagged assets; GW = amount of goodwill before impairment in relation to previous total assets; RET_t = current annual return on shares adjusted by dividends; RET_{t-1} = lagged annual return; ROA = return on assets measured as net earnings before goodwill impairment over lagged total assets; SIZE = company size determined by the natural logarithm of lagged total assets.
****, **, * = 1, 5, and 10% significance, respectively.*
Source: *Elaborated by the authors.*

The univariate analysis shows that the correlations between each independent variable and the dependent variables (GI) follow the expected sign and are statistically significant, with the exception of the current return and size of the company. This provides preliminary evidence that, while the companies recognize the loss from a reduction in the recoverable amount of goodwill, they also present lower previous returns and ROA and higher goodwill. In addition, the lack of significance in the coefficient of correlation between the current return and the recognition of goodwill impairment may be considered as preliminary evidence regarding the lack of timeliness of that loss, despite there being a weak correlation when the amount of the loss is concerned.

When considering the correlations between independent variables, it is possible to obtain indications regarding the existence of possible multicollinearity. Despite some correlations being significant, none were close to 0.8, indicating that multicollinearity is not a problem. This is confirmed by the test of the variance inflation factor (VIF), which was around 1 (1.16) for all the variables considered. Besides multicollinearity, another assumption that should be considered when using the logit and tobit models is the absence of autocorrelation. For that, the Wooldridge test was run, which rejected the null hypothesis of an absence of autocorrelation. Thus, the logistic regression and tobit models were run with robust standard errors clusterized by company, whose results are presented in Table 5.

Table 5
Logistic regression and tobit results

	Expected sign	Logit			Tobit	
		Coefficient	Odds ratio	z	Coefficient	*t*
RET_t	(-)	-0.001	0.999	-0.27	-0.000	-0.21
RET_{t-1}	(-)	-0.009**	0.991	-2.37	-0.000**	-2.30
BM	(+)	-0.019	0.981	-0.13	0.002	0.42
ROA	(-)	-2.279	0.102	-1.01	-0.074	-1.44
GW	(+)	0.743	2.103	0.81	0.041*	1.86
SIZE	(+)	0.024	1.024	0.22	-0.000	-0.02
Constant	?	-2.558	0.078	-1.03	-0.060	-1.05
		n = 899			n = 899	
					n censured to the left (0) = 800	
		Pseudo R^2 = 0.046			Pseudo R^2 = 0.588	
		Wald chi^2 stat. = 14.87**			F = 2.13**	
Mean VIF		1.16			Wooldridge	8.746***

Note: *Coefficients of the tobit regression are close to 0 because the dependent variable represents the percentage of loss in relation to assets.*
BM = book-to-market ratio calculated as net equity before impairment divided by the firm's market value; VIF = variance inflation factor; GW = amount of goodwill before impairment in relation to previous total assets; RET_t = current annual return on shares adjusted by dividends; RET_{t-1} = lagged annual return; ROA = return on assets measured as net earnings before goodwill impairment over lagged total assets; SIZE = company size determined by the natural logarithm of lagged total assets.
****, **, * = 1, 5, and 10% significance, respectively.*
Source: *Elaborated by the authors.*

The logistic regression results include the coefficients of the variables, in order to evaluate the sign of the relationship, and the odds ratio, which indicates how many times the probability of recording goodwill impairment is impacted by the variables. In addition, Table 5 shows that the model is statistically significant at 5% and explains around 4.58% of the variation in the probability of impairment recognition. This low percentage occurs due to a limitation of the logistic regression itself, which generally presents low explanatory power (Gujarati & Porter, 2011).

With relation to the variables, it was found that only the lagged return was statistically significant. With a negative sign, this variable indicates that the lower the lagged return is, the greater the probability of recognizing a goodwill impairment loss. Despite being significant, however, these chances do not change by high magnitudes, given that the odds ratio is close to 1. In turn, the current return on the shares was not statistically significant, generating evidence consistent with scenario 2 of Figure 1 and with the study hypothesis.

Considering the tobit regression, the model had a greater test power, explaining around 58.77% of the variation in the loss value. In this model, goodwill became significant and positively associated with the impairment amount, indicating that greater goodwill is related with greater impairment losses, as expected. In addition, it was observed that the results regarding returns are similar to those found in the logistic regression, indicating that the more negative the lagged return is, the greater the amount of the goodwill loss, and that the loss is not explained by the current return on the shares.

Therefore, the results of both the logistic regression and the tobit model provide evidence consistent with the hypothesis that the goodwill impairment is not recognized in an entirely timely manner by Brazilian companies. In addition, it can be said that this loss is not totally, nor even partially, timely. Due to this evidence and the possibility of managers using their discretion to avoid, delay, or accelerate the loss from goodwill impairment, Table 6 presents some additional analyses regarding these questions, examining its timeliness in a more comprehensive way.

Table 6
Additional analyses regarding the timeliness of goodwill impairment

Panel A: Evidence about avoiding impairment							
Year	**Companies with a loss**	**Companies with economic indications of a loss**					
		EBITDA < 0		**BM > 1**		**MV-NE < goodwill**	
		n	**With a loss (%)**	**n**	**With a loss (%)**	**n**	**With a loss (%)**
2010	4	5	80.00	13	30.77	16	25.00
2011	8	11	72.73	28	28.57	35	22.86
2012	10	15	66.67	27	37.04	34	29.41
2013	14	11	127.27	28	50.00	38	36.84
2014	11	12	91.67	31	35.48	43	25.58
2015	16	20	80.00	43	37.21	50	32.00
2016	18	18	100.00	30	60.00	42	42.86
2017	13	20	65.00	26	50.00	34	38.24
2018	8	16	50.00	23	34.78	31	25.81
2019	11	16	68.75	13	84.62	20	55.00
2020	16	14	114.29	19	84.21	27	59.26
Total	129	175	73.71	287	44.95	419	30.79

Panel B: Evidence of a delay in goodwill impairment			
	Logistic		**Tobit**
	Coefficient	**Odds ratio**	**Coefficient**
RET_t	-0.001	0.999	-0.000
RET_{t-1}	-0.010**	0.990	-0.000**
RET_{t-2}	-0.011***	0.989	-0.000***
RET_{t-3}	-0.003	0.997	-0.000*
BM	-0.196	0.822	-0.003
ROA	-1.841	0.159	-0.079
GW	0.572	1.772	0.038*

Table 6
Cont.

Panel B: Evidence of a delay in goodwill impairment			
	Logistic		**Tobit**
	Coefficient	**Odds ratio**	**Coefficient**
SIZE	0.032	1.032	0.000
Constant	-2.454	0.086	-0.063
	n = 691		n = 691
			Censured n = 610
	Pseudo R^2 = 0.073		Pseudo R^2 = 0.766
	Wald chi^2 = 22.35***		F = 3.00***
Panel C: Evidence of acceleration of goodwill impairment			
	Logistic		**Tobit**
	Coefficient	**Odds ratio**	**Coefficient**
RET_{t+1}	-0.002	0.998	-0.000
BM	-0.148	1.162	0.003
ROA	-2.997	0.050	-0.077*
GW	1.011	2.746	0.032
SIZE	0.012	1.011	-0.001
Constant	-2.585	0.078	-0.039
	n = 857		n = 857
			Censured n = 769
	Pseudo R^2 = 0.026		Pseudo R^2 = 0.732
	Wald chi^2 = 7.02		F = 1.79

BM = book-to-market ratio calculated as net equity (NE) before impairment divided by the firm's market value; GW = amount of goodwill before impairment in relation to previous total assets; MV = market value; RET_t = current annual return on shares adjusted by dividends; RET_{t+1} = annual return in t+1; RET_{t-1} = lagged annual return; RET_{t+2} = annual return in t+2; RET_{t+3} = annual return in t+3; ROA = return on assets measured as net earnings before goodwill impairment over lagged total assets; SIZE = company size determined by the natural logarithm of lagged total assets.
, **, * = 10, 5, and 1% significance, respectively.*
Source: *Elaborated by the authors.*

Following the methodology of André et al. (2016), Panel A of Table 6 provides evidence about the possibility of managers avoiding a goodwill loss. For that, a number of economic indicators of impairment were analyzed: negative EBITDA, BM higher than 1, and a difference between the market value and NE lower than the goodwill amount. Based on these factors, the conditional frequency of accounting impairment is calculated, that is, the percentage of recognized losses is estimated in relation to the quantity of losses that should have been recorded based on those economic indicators.

The results of Panel A generally show that the quantity of companies that recorded goodwill losses was lower than the number of companies that should have recognized them based on the indicators used. Based on the negative EBITDA, there would need to be 175 observations with goodwill impairment during the period, 287 if considering the BM, and 419 based on the difference between the market value and NE. However, only 129 companies recognized impairment during the years analyzed. This may suggest that some companies avoid recognizing a goodwill impairment loss, even when there are indications for this. It should be noted, however, by considering the negative EBITDA, that 73.71% of the companies-years that should have recognized a goodwill loss did so, suggesting that the firms consider this indicator at the time of recognizing goodwill impairment.

Panel B extends the analysis of Table 5, in order to discover up to how many years the loss from a reduction in the recoverable amount of goodwill was delayed. For that, new lags of annual return were included, until these lose statistical significance. The results show that the inclusion of more lags improved the explanatory power of the models, and that the current return remained

insignificant while those lagged by one and two years were negatively significant. However, the logit and tobit models differ in relation to the return lagged by three years, being significant at 10% when it is to explain the amount of the loss. In general, this evidence indicates that the loss from goodwill impairment is delayed by at least one to two years, and that its amount can also have a relationship with evidence from three years before. In addition, it was observed that the significance of the return in t – 2 is greater, which may be an indication that goodwill impairment is prone to being delayed more by two years.

Finally, Panel C of Table 6 considers the possibility that managers accelerate the recognition of goodwill impairment, recognizing it too early. For this analysis, instead of using lagged returns, the annual return on the shares for the period immediately after was used. The evidence showed that the model does not have explanatory power when only the return in t + 1 is included and that this was not statistically significant. Therefore, this analysis suggests that managers do not accelerate the recording of the loss from goodwill impairment.

To ensure greater robustness of the results obtained, some sensitivity analyses were conducted. First, current and lagged returns were considered in separate regressions, in order to mitigate any remaining concern about a possible relationship between these variables. It was observed that current return continues without statistical significance, while lagged return remains negative and statistically significant at a 5% level.

In addition, the possibility that the correlated control variables could generate a false positive was considered, applying a stepwise regression to mitigate this concern. The non-tabulated analyses showed that only lagged return remained negative and statistically significant in all stages and that all the control variables behaved in the same way as presented in Table 5.

Model 1 was also run with some alternatives for treating outliers, using winsorization of the data at 1% and 5% and not carrying out any intervention. With this, it was observed that the results are the same as those that exclude outliers. Therefore, the evidence raised in Table 5 is robust to different forms of estimating the models and data, with current return remaining insignificant and lagged return remaining negative and significant at 5%.

4.2 Discussion of the Results

According to the results presented, fewer than 10% of the Brazilian companies recorded a goodwill impairment loss in the period, a percentage a little higher than the 6% observed by Vogt et al. (2016) throughout 2011 and 2014. Despite the low frequency, the loss amount may be material, reducing the goodwill amount to16% on average and potentially reaching almost 30% of lagged total assets. As managers may make discretionary judgements to avoid losses, impairment will only occur when there is irrefutable evidence of a reduction in the goodwill amount. Thus, companies would not record small reductions, but would wait until the goodwill was obviously lost, reducing it by greater amounts (Li & Sloan, 2017; Linsmeier & Wheeler, 2020). This would explain the low frequency of goodwill impairment and its materiality.

Comparing the frequency of goodwill impairment between Brazil and other countries that adopt the international accounting standards, it is possible to verify that the recognition of this loss is less frequent. For example, Albersmann and Quick (2020) observed that 21.5% of German companies disclosed impairment losses in the period from 2006 to 2013, while Choi and Nam (2020) reported a 22% frequency in companies from South Korea during 2011 and 2016. Despite involving different periods, these studies also analyze goodwill impairment since the first years of adoption and consider an even shorter window than the one compared in this study. Therefore, it can be said that the frequency of goodwill impairment in Brazil is lower compared to other countries.

The regression results showed that goodwill impairment losses are not recognized in a timely manner, which is consistent with previous studies conducted in the United States (Beatty & Weber, 2006; Li et al., 2011; Li & Sloan, 2017), Germany (Albersmann & Quick, 2020), Australia (Ji, 2013), and South Korea (Choi & Nam, 2020). In addition, it is observed that managers avoid these losses, delaying their recognition by at least one to two years, which is a similar result to that of Albersmann and Quick (2020). In addition, it is possible that the amount of the loss recognized in goodwill is influenced by factors occurring up to three years before its recognition. These findings corroborate the study hypothesis and may be explained by two factors: the shielding effect of the standard (headroom) and the discretion of the test.

The standard itself may lead to a lack of timeliness of goodwill impairment, as it provides a shielding effect against losses, due to the headroom. The headroom is the amount by which the recoverable amount of a CGU exceeds the book value of its recognized net assets. This occurs because goodwill is allocated and tested together with a CGU, which includes other net assets and, consequently, items not recognized in the balance sheet and goodwill generated internally. Thus, the recoverable value of these other assets is likely to exceed their book

value, giving a margin that avoids the recognition of the goodwill loss (IASB, 2020; Johansson et al., 2016).

With regard to discretion, as managers have incentives to avoid losses, they may make optimistic judgements in the test assumptions, in order to avoid or delay the recognition of goodwill impairment (Abughazaleh et al., 2011; Filip et al., 2021; Gu & Lev, 2011; Ramanna & Watts, 2012). Inversely, the lack of timeliness found may be an indication that managers use the discretion of the impairment test of goodwill opportunistically to alter its timing, and not to communicate private information to the capital market.

It should also be noted that the lack of timeliness of goodwill impairment observed in this study may also be explained by the Brazilian context, which may not provide the mechanisms needed to limit the opportunistic use of discretion. International studies indicate that timeliness depends on the institutional environment, where companies located in countries with high enforcement have more chance of recognizing a goodwill loss in a timely manner than companies from countries with low enforcement, since this would limit opportunism (Filip et al., 2021; Glaum et al., 2018). Thus, the lack of timeliness of goodwill impairment may be associated with the level of enforcement in Brazil, which, as it is code law, would be limited.

Finally, the evidence from this study can help to explain the findings of Cappellesso et al. (2018), who identified that the Brazilian capital market does not react to the recognition of goodwill impairment. The absence of relevance in this information may be associated with the lack of timeliness of this loss, since investors would need information in time to be able to influence their decisions, and with the opportunistic use of discretion, which would delay the recognition of the loss and affect its informational content.

5. CONCLUDING REMARKS

This study aimed to investigate the timeliness of goodwill impairment losses perceived by the Brazilian capital market. As the impairment test provides broad discretion to managers, they may make optimistic judgements in order to avoid or delay the loss from goodwill impairment, hindering the timeliness of this information.

To analyze this question, it was verified whether the current and lagged returns on shares help to explain the decision to recognize the losses or not in Brazilian companies that had goodwill in the period from 2010 to 2020. The results showed that losses from reductions in the recoverable amount of goodwill are not recognized in a timely manner, and that managers delay recording them by at least one to two years, with stronger indications for late recognition by two years. In addition, the decision on the amount of the loss to be recorded may also be related to factors that occurred three years before its recognition. Despite the lack of timeliness potentially deriving from limitations of the standard itself, this result may be explained by the opportunistic use of discretion by management, which would have incentives to avoid recording losses. So, the findings of this study may also indicate the way that managers use the discretion of the test, pointing more to opportunistic use than to the communication of private information to the market. This finding is consistent with the lack of timeliness in countries with a low level of enforcement, such as Brazil.

These results are relevant not only for Brazil, but also for other countries with a similar institutional context. In addition, the findings have important implications for the IASB, which has discussed improvements in the goodwill impairment test, indicating the need for a system that improves the timeliness of this information for users. Finally, the results are also important for regulatory bodies and auditors, as they indicate the need for these actors to adopt strategies to limit management opportunism in order to provide more timely information to users. Thus, an increase in timeliness would be a joint effort between standard-setters and monitors, as well as involving a change in the behavior of management itself.

As limitations of this study, it is important to highlight that return on shares as an indicator of timeliness depends on the market efficiency assumption, that is, that this piece of data reflects all publicly-available information that can provide timely news about the need for impairment. Within this context, future studies could seek other forms of measuring timeliness, deepening the frequency analysis with economic indicators of goodwill loss. Another suggestion is for subsequent research to analyze whether the monitoring, for example, of independent auditors and evaluators can influence the timeliness of goodwill impairment.

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