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Value Relevance of Intangible Assets Recognized in a Business Combination

ABSTRACT

Objective: To verify the value relevance of intangible assets recognized in a business combination of Brazilian publicly traded companies.

Method: The sample of 165 companies, covering 962 observations, from 2010 to 2017, was analyzed using five panel data regressions based on Ohlson's model (1995; 2005) to test four research hypotheses.

Originality/Relevance: Value relevance studies have analyzed goodwill, but there are gaps this study seeks to fill. The study addresses the value relevance of intangibles assets recognized in a business combination for the stock market, exploring goodwill and other types of intangibles recognized in a business combination. Also, IFRS 3 was discussed in 2015, bringing the stock market's perspective and the standard application to the center of accounting research.

Results: The results showed that goodwill represents 23% to 30% of intangible assets recorded in the balance sheet, while other intangibles identified represent around 5.6%. As for value relevance, it was observed that both the recognized value of the intangible assets and, when segregated in goodwill and in identified intangible assets, were significant and positively related to the market value. Concerning the nature of intangibles recognized in business combinations, some of them were related to market value.

Theoretical/Methodological contributions: The research contributes to value relevance literature on business combinations, allowing us to understand that they are relevant to the stock market and contribute to Brazilian companies' market value.

Keywords: Business combination; Intangible assets; Value relevance.

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1 INTRODUCTION

Stock prices in the financial market vary according to the news on political, social, and economic dimensions (Silva, Carvalho & Nunes, 2012). Regarding the political aspects, news on Brazilian presidents in 2017 and 2018 led to fluctuations in the country's stock exchange (Sutto, 2017; Gavras, Oliveira, Dyniewicz, & Cavalcanti, 2018). As for social aspects, the rupture of tailing dams in 2015 and 2019 caused the mining company Vale S.A.'s shares to oscillate negatively (Aguiar, 2019; Durão, Ciarelli & Guimarães, 2015). Finally, news on economic aspects affects the stock prices based on investors' gains or losses expectations. Examples were the announcement of the business combination between Locamerica and Unidas (Oliveira, 2018) and the acquisition of Avon by Natura & Co, which resulted in an estimated synergy exceeding USD 150 million per year (Melo, Cleto, & Ryngelblum, 2019).

Eloy and Souza (2018) identified synergy. They reported that some companies record expected synergy in their intangible assets when carrying out a business combination. For some companies, synergy is one of the factors that make up goodwill.

The information is quickly presented to the financial market that often reacts (Silva *et al.*, 2012), especially when the information is negative and uncertain (Galdi & Gonçalves, 2018). The stock market has become more competitive as information is timelier and more reliable. For investors, information is relevant to minimize informational asymmetry, considering that investors are willing to pay the share price after due-diligence (Rezende, Almeida, & Lemes, 2015).

In the literature, value relevance studies are those that verify the relevance of accounting information. They show the relevance and reliability of information so that the company's price follows its disclosure (Barth, Beaver, & Landsman, 2001; Lopes & Iudícibus, 2004). In addition, these studies between share price and accounting information seek to explain the behavior of shares through accounting variables (Macedo, Machado, Murcia, & Machado, 2011).

The comprehension of accounting information's relevance to the stock market is important since not all information users have the same accounting understanding or access to company data. It also helps prepare financial statements to understand what information users consider relevant (Benston, 1967). Therefore, a report allowing users to make their own inferences fulfills the role of the technical pronouncement of the Accounting Pronouncements Committee (CPC) 00 – Conceptual Framework for Financial Reporting (Comitê de Pronunciamentos Contábeis R2, 2019).

According to accounting standards, there are intangible assets generated internally that cannot be reliably measured, and as a consequence, are not included in the balance sheet. However, when there is a business combination, these assets are measured at fair value and recorded in the balance sheet. This divergence of not recording internally generated intangibles may result in a difference between the book value and the market value, thus affecting accounting's relevance based on the standards adopted (García-Ayuso, 2003).

The goodwill is among the internally generated items that cannot be activated. It corresponds to an entity's ability to generate above-normal earnings (Chauvin & Hirschey, 1994). The future benefit of goodwill is the ability to generate, together with other flows, cash assets, and the capacity to control these flows (Victor, Tinta, Elena & Ionel, 2012).

Hamberg and Beislan (2014) verified that the goodwill generated in a business combination recognized in intangible assets is relevant for the capital market in a European context. Souza and Borba (2017) showed that goodwill in Brazilian companies does not have statistical significance for the share price. For Souza, Rover, and Borba (2016), Brazilian companies that had lower levels of disclosure of business combinations were those that

allocated higher values to goodwill. Finally, Eloy and Souza (2018) showed that 83% of business combinations recorded goodwill.

International studies have agreed regarding the value relevance of goodwill (Hamberg & Beisland 2014; Henning, Lewis, & Shaw, 2000; Jennings, Robinson, Thompson, & Duvall, 1996), whereas Brazilian studies indicate that goodwill has no relevance for the stock market (Carlos Filho, Conegliam, & Carmo, 2013; Souza & Borba, 2017). However, before recognizing goodwill, the company needs to allocate the added value to the identifiable items, such as brands and customer portfolio, which due to accounting standards, have limited recognition because of the measurement reliability.

The aforementioned studies segregated intangible assets into goodwill and identified intangibles. Not exploring the nature of these recognized intangibles. This research aims to fill this gap on how the relevance of the intangible asset acquired in a business combination impacts the market value. Therefore, this study seeks to answer the following problem question: What is the relevance of intangible assets recognized in business combinations of Brazilian publicly traded companies for the stock market? In order to obtain an answer to this question, this research aims to verify the relevance of intangible assets recognized in business combinations of Brazilian listed companies.

In 2015 the International Financial Reporting Standards (IFRS) started a debate on improving the application of IFRS 3-Business Combinations, launching a Discussion Paper in March 2020. This study contributes by emphasizing the stock market's perspective and how companies adopt this standard when attributing fair value to intangibles.

The use of intangible assets in the research refers to how the stock market interprets the values in the balance sheet, using Ohlson's model (1995; 2005). These values are considered relevant and reliable since they are accounted for at fair value when acquired in business combinations.

That said, this study intends to contribute theoretically to the line of research on the relevance of book values, focusing on intangible assets recognized in business combinations. And in a practical way with the perception of the stock market about the identified intangible assets recognized in business combinations. And in a practical way with the perception of the stock market about the identified intangible assets recognized in business combinations, as according to Eloy and Souza (2018) most of the purchase price is allocated to goodwill.

This study is composed of six sections. The first is this introduction, followed by a review of the literature on intangible assets recognized in business combinations and their relevance. The third section presents the methodology used. The results are presented in the fourth section, and their are analyzed and discussed in the fifth section. In the sixth, final considerations and suggestions for future research.

2 VALUE RELEVANCE OF INTANGIBLE ASSETS RECOGNIZED IN BUSINESS COMBINATIONS

Among companies' strategies to gain market share, reduce costs, or address changes in regulations or technologies, are the participation in associations, coalitions, or mergers with other companies (Hajj & Lisboa, 2001). In other words, companies resort to business combinations to improve their position in the economic-financial market.

According to CPC 15 - Business Combination, which is equivalent to IFRS 3 (R1, 2011), a business combination can be defined as an operation in which the buyer obtains control of one or more businesses, regardless of the legal form of the operation. Upon the takeover, the buyer must recognize and measure the identifiable assets and liabilities assumed, as well as the goodwill or gain from an advantageous acquisition.

CPC 15 (R1, 2011) defines the acquisition method for business combination accounting, in which the identified assets and liabilities acquired are measured at fair value. If the consideration is greater than the net value of the identified assets and liabilities assumed, goodwill must be recognized (otherwise, an advantageous acquisition is recognized). The identified assets should be depreciated or amortized based on the remaining period in addition to having their recoverable values tested annually. Goodwill should not be amortized but should just have its recoverable value tested annually through the procedures reported in CPC 01 – Impairment of Assets (R1, 2010).

Previously, there were two methods for business combinations accounting, pooling of interests, and purchase. The pooling of interests encompassed the accounting of the assets and liabilities of the companies at book value, the payment was through exchange of shares, and there was no buyer and seller (Hajj & Lisboa, 2001). As for purchase, the accounting did not consider the asset's cost but its fair value (market value). This method applied to operations that did not meet the pooling of interests' requirements, but in July 2001, it came to be considered the valid method in all business combination operations (Hajj & Lisboa, 2001).

According to Baker, Bionde, and Zhang (2010), the issuance of business combination standards by FASB and IASB adopting only one method did not consider the countries' particularities. The authors refer to China, where the two methods are accepted as political and economic factors overlap international standards. For them, this issue indicates disharmony in standards due to an imperfect market and unreliable fair values.

Lhaopadchan (2010) discusses the difficulty in obtaining the fair value of non-traded assets. For example, the amount allocated to goodwill is easily identified at the time of the business combination. However, it is difficult to assess the assets' fair value in the future and know how much goodwill impairment should be reported.

Business combinations can also generate identified intangible assets, such as brands and customer portfolios. These assets are not recognized in the acquiree since, due to measurement, they do not meet the recognition criteria; but can be recognized in the acquirer's balance sheet at their fair value.

Eloy and Souza (2018) identified 130 business combinations in a study on the characteristics of intangible assets recognized in business combinations of Brazilian listed companies between 2012 and 2014. The authors found that 69 cases did not identify intangible assets, attributing a larger portion of the consideration to goodwill, while five combinations accounted for only identified intangible assets. The authors observed that 56 business combinations recorded goodwill and identifiable intangible assets, with brand and client portfolio being the most recognized intangibles.

Financial statements must be prepared so that users can make inferences about the company's financial-economic situation (Comitê de Pronunciamentos Contábeis 00 R2, 2019). When disclosed, the information is incorporated into the stock market – an efficient market is where stock prices reflect the available relevant information facilitating production, investment, and financing decision-making. Thus, stock prices are associated with new information (Fama, 1970).

The stock market reacts in different ways to the disclosed information. Therefore, it is essential that all users, especially investors, receive quantitative or qualitative information at the same time (Silva *et al.*, 2012). However, it is difficult to determine what data is useful when users are not in direct contact with those who prepare the reports relevant to all stakeholders. In this sense, studies connecting information and market prices to assess which data is more relevant have gained importance (Benston, 1967).

Ball and Brown (1968) and Beaver (1968) sought to verify how the profit information influences share prices. For the authors, information is relevant to price formation. Beaver

(1968) found that investors perceive profit through stock swings after disclosure, while Ball and Brown (1968) observed that the stock market reacts to profit by adjusting the stock price according to the new information.

However, profit is not the only useful information for the market; it is just one of the many sources of information available to investors (Ball & Brown, 1968). Relevant accounting information, for example, can be crucial in the user's decision.

In the academic literature, value relevance tests aim to increase knowledge on the relevance of accounting amounts, as demonstrated in equity values (Barth *et al.*, 2001). If the stock is popular with investors, prices must indicate investors' expectations about the company's value (Ghahramanizady & Behname, 2013).

Ohlson's model (1995) is composed of net equity and net profit and is often used as a basis for value relevance studies. Barth *et al.* (2001) argue that, although the model assumes perfect capital markets, it also includes imperfect product markets. Therefore, it allows us to observe the explanatory power of net equity, net income, and other information, which can be changes in legislation and level of disclosure or the influence of legislation and disclosure on the stock market.

Jenning *et al.* (1996) discussed the change in goodwill legislation establishing that amortization had to occur in up to 20 years. The acquired goodwill had a positive and significant coefficient throughout the analyzed period (1982-1988), indicating that it represents an economic resource, both at the time of acquisition and in the following years, reflecting the expected benefits.

Henning *et al.* (2000) analyzed the components of goodwill. They presented positive coefficients for both synergy and goodwill, demonstrating that investors attribute different values to goodwill components.

The goodwill of acquisitions has gained increasing importance for the companies' general value as uncertainties and managerial description may lead to concerns about the fiscal year results. According to Lhaopadchan (2010), the introduction of fair value may have interfered in the materiality of the information available to users. For example, the author cites the decline in billions of goodwill from Vodafone, suggesting that managers use the financial crisis and the declining market to justify goodwill impairment from past acquisitions.

Changes in business combinations accounting were studied by Hamberg and Beisland (2014). The authors argue that the Swedish market continued to consider goodwill relevant. However, its change to use the impairment test ended up having a reduced explanatory power between 2001 to 2010 compared to amortization. According to the authors, this happened because, due to perceived deficiencies, they had not considered amortization before.

Addressing the change to IFRS 3 in Africa in 2008, Tunyi, Ehalaiye, Gyapong, and Ntim (2019) identified that intangibles recognized in business combinations became relevant after adopting the standards, demonstrating that investors started to value the description of intangibles when acquiring a company. However, when making a general analysis from 2004 to 2016, the intangibles identified were negatively related to the price, indicating improvements in legislation change. When comparing before and after the adoption of IFRS 3, identified intangibles became positively related to the price.

The influence of the IFRS 3 in the relationship between intangibles identified and price indicates a limitation of the intangibles recognized in a business combination. Su and Wells (2015) explain that these identified intangibles do not influence the post-acquisition performance. When assessing the association between identifiable intangible assets acquired and recognized in business acquisitions and the companies' performance post-acquisition from 1988 to 2008 in Australia, the authors found that the business combination did not affect

performance during or post-acquisition. Goodwill remained significant after the transition to IFRS in 2005, in which there is an incentive to record more identified intangibles.

The relevance of goodwill to the stock market was also found by Kimouche and Rouabhi (2016) in France. Goodwill and intangible assets and amortization and impairment losses obtained an explanatory power of 39.7%, with the coefficient of goodwill being higher than that of intangible assets. Amortization and losses did not affect the market value, suggesting that the amounts reported are not considered reliable because they are based on managers' judgments and estimates.

When investigating whether the identified intangible assets of a business combination are relevant, King, Linsmeier, and Wangerin (2019) found that some intangibles, when strategically important, were positively and significantly associated with the share price. Some intangibles did not show this value relevance. Thus, the authors concluded that acquired intangibles are considered relevant when associated with the company's strategy. However, some intangibles are not particularly interesting for the investors' goals and can be replaced.

Souza and Borba (2017) addressed business combinations' disclosure, obtaining an average level of 29% (minimum 7% and maximum 66%). When verifying whether this level of disclosure was relevant for the Brazilian stock market between 2010 and 2013, they found that it was positively related to the share price. However, both the goodwill and the identified intangibles were insignificant, suggesting that they are not relevant to explain asset prices.

The change to international accounting standards was decisive in the increase of intangibles recognized in the balance sheet, mainly due to the identified intangibles (Carlos Filho *et al.* 2013). Carlos Filho *et al.* (2013) also found that companies with intangibles have higher price shares – for the investors, however, one type of intangible (goodwill or identified) is not more important than another.

For Herculano and Piccoli (2016), international accounting standards contribute to improving accounting information quality. For the authors, after the adoption of IFRS in Brazil, the intangibles identified were positively related to the share value, while goodwill was not significant.

Studies on business combinations that address the value relevance of the recognized identified intangible asset are scarce and usually focus on goodwill. The studies by Hamberg and Beisland (2014), Jennings *et al.* (1996), Lhaopadchan (2010), and Su and Wells (2015) point out that goodwill affects companies' market value. In contrast, Herculano and Piccoli (2016) and Souza and Borba (2017) found the opposite. The studies by King *et al.* (2019) and Tunyi *et al.* (2019) point out the significance of the identified intangibles, opposing Souza and Borba (2017) and Su and Wells (2015). The study by Carlos Filho *et al.* (2013) found that the market does not distinguish between the type of intangible (identifiable or goodwill), but it observes these intangibles when making decisions. Against this backdrop, four research hypotheses were elaborated:

Hypothesis 1: The intangible asset recognized in a business combination is positively related to the market value.

Hypothesis 2: The goodwill recognized in a business combination is positively related to the market value.

Hypothesis 3: The identified intangible asset recognized in a business combination is positively related to the market value.

Hypothesis 4: The nature of the intangible asset recognized in a business combination is positively related to the market value.

Despite its relevance in international research, goodwill has not been relevant in the Brazilian context. Notwithstanding, Carlos Filho *et al.* (2013) found that the stock market corresponds positively to goodwill, considering this sub-account to be relevant for

investments – even though the authors did not find statistical significance in the model and perceived the relevance of the item to the capital market through the increase of explanatory power. As for intangible assets recognized in a business combination, the brand and the customer portfolio were the most frequent items identified (Eloy & Souza, 2018). Finally, due to the divergence in the literature, this research seeks to verify whether, in the Brazilian context, the intangible assets generated in a business combination are related to the market value. It also examines whether the intangible assets recognized at fair value are relevant to the market through its coefficient in the regression model.

3 METHODOLOGY

The research population consists of all publicly traded non-financial companies listed in the Brazilian stock exchange *Brasil, Bolsa, Balcão* (B3). The criteria to form the sample consisted of having intangible assets, identified or not, recognized in a business combination. Also, the companies in the sample had to adopt the end of the fiscal year as December 31. Therefore, the sample was formed with 165 companies with intangible assets recognized in a business combination.

The study was based on the companies’ standardized, consolidated financial statements published at the end of the year (December 31). In cases where companies did not consolidate their statements, the study adopted individual statements. The 165 companies of the sample generated 1,320 observations, reduced to 962, as demonstrated in Table 1.

Table 1

Observations per year

Year	2010	2011	2012	2013	2014	2015	2016	2017	Total
Sample/observations	165	165	165	165	165	165	165	165	1.320
(-) Without intangible	16	11	20	23	25	28	33	34	190
(-) No shares in the stock market	42	35	28	22	17	15	3	-	162
(-) End of the fiscal year	2	2	2	-	-	-	-	-	6
Total	105	117	115	120	123	122	129	131	962

Source: Research data.

We analyzed the period from 2010 to 2017 to verify the influence of the intangible asset recognized in a business combination in the market. The period refers to the adherence to international standards until 2017, due to data collection having taken place in October 2018.

First, Ohlson’s model (1995; 2005) was adapted (Equation 1), using the market value as the dependent variable and net equity and the net income as the control variables.

$$MV_{i,t} = \alpha_0 + \beta_1 NE_{i,t} + \beta_2 NI_{i,t} + \epsilon_{i,t} \tag{1}$$

Where,

$MV_{i,t}$ = Market value *i* three months after the end of the fiscal year *t*;

$NE_{i,t}$ = Net equity *i* at the end of the fiscal year *t*;

$NI_{i,t}$ = Net income *i* during fiscal year *t*.

The market value was established considering three months after the end of the fiscal year (Jennings *et al.*, 1996) because the financial statements disclosed in the first quarter after the end of the fiscal year incorporate the share prices (Shah, Liang & Akbar, 2013), and consequently the market value.

Equations 2 to 5 were elaborated to assess whether the intangibles recorded and/or acquired in a business combination are relevant to the stock market. The equations add explanatory variables to Ohlson’s (1995) model used as a basis, allowing to verify the

incremental power. As for hypothesis 1, Equation 2 was prepared to verify whether the intangibles recognized are relevant to the market value.

$$MV_{i,t} = \alpha_0 + \beta_1(NE-COMB)_{i,t} + \beta_2NI_{i,t} + \beta_3COMB_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where,

NE-COMB_{i,t} = shareholders' equity less intangible assets (identified or not) recognized in a business combination in the balance sheet of the company *i* in period *t*;

COMB_{i,t} = value of intangible assets (identified or not) recognized in a business combination of the company *i* in period *t*.

Equation 3 was elaborated to test the second hypothesis, in which goodwill was inserted (Carlos Filho *et al.*, 2013; Ghahramanizady & Behname 2013; Jennings *et al.*, 1996; Souza & Borba, 2017) to verify whether goodwill recognized in a business combination is positively related to market value.

$$MV_{i,t} = \alpha_0 + \beta_1(NE-GOOD)_{i,t} + \beta_2NI_{i,t} + \beta_3GOOD_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where,

NE-GOOD_{i,t} = shareholders' equity less goodwill recognized in the balance sheet of the company *i* in period *t*;

GOOD_{i,t} = value of the intangible asset (type goodwill) of the company *i* in period *t*.

Equation 4 tests hypothesis 3, verifying whether the identified intangible assets are relevant to the market value. It includes the variable identified intangible asset (King *et al.*, 2019; Souza & Borba, 2017; Su & Wells, 2015; Tunyi *et al.* 2019).

$$MV_{i,t} = \alpha_0 + \beta_1(NE-IIA)_{i,t} + \beta_2NI_{i,t} + \beta_3IIA_{i,t} + \varepsilon_{i,t} \quad (4)$$

Where,

NE-IIA_{i,t} = shareholders' equity less the identified intangible assets of the company *i* in period *t*;

IIA_{i,t} = value of the intangible assets (type identified intangible) recognized in a business combination of the company *i* in period *t*.

Finally, Equation 5 was prepared to verify whether the nature of the intangible asset recognized in a business combination is associated with the market value, according to hypothesis 4. It should be noted that the variable customer portfolio encompasses the values identified as customer portfolio, contracts with suppliers and customers, and relationship with suppliers and customers.

$$MV_{i,t} = \alpha_0 + \beta_1(NE-COMB)_{i,t} + \beta_2NI_{i,t} + \beta_3GOOD_{i,t} + \beta_4ADDV_{i,t} + \beta_5PAT_{i,t} + \beta_6LIC_{i,t} + \beta_7FUND_{i,t} + \beta_8SOFT_{i,t} + \beta_9RIGHT_{i,t} + \beta_{10}CONTR_{i,t} + \beta_{11}PORT_{i,t} + \beta_{12}BRAND_{i,t} + \beta_{13}OTHER_{i,t} + \varepsilon_{i,t} \quad (5)$$

Where,

ADDV_{i,t} = value of the added value of the company *i* in period *t*;

PAT_{i,t} = patent value of the company *i* in period *t*;

LIC_{i,t} = value of the license of the company *i* in period *t*;

FUND_{i,t} = value of goodwill of the company *i* in period *t*;

SOFT_{i,t} = value of the software of the company *i* in period *t*;

RIGHT_{i,t} = value of the rights and concessions of the company *i* in period *t*;

CONTR_{i,t} = value of the non-competition contract of the company *i* in period *t*;

PORT_{i,t} = value of customer portfolio of the company *i* in period *t*;

BRAND_{i,t} = brand value of the company *i* in period *t*;

OTHER_{i,t} = value of other intangible assets of the company *i* in period *t*.

The variable market value (MV) was collected using the Economatica® software, with a 30-day tolerance. The control variables (NE and NI) were collected in the standardized financial statements available on the B3 website. The values of goodwill and identified intangible assets were obtained in the explanatory notes. When the company had goodwill but did not have identified intangibles, a value of zero was considered to analyze how intangibles influence market value. For standardization purposes, all variables were divided by the number of shares. Of the 962 observations, a market value of 848 was obtained, so that 114 observations were excluded because they did not present the market value.

The data were analyzed by multiple regression with panel data using the Stata® Statistic software. Due to data dispersion, Hadi’s technique (1992) was used to detect the sample outliers, finding 115 observations. Thus, Equations 1 to 5 were performed with 733 observations. In order to assess the model among POLS, random effects, and fixed effects, we applied the LM Breusch-Pagan, Chow, and Hausman tests. The results indicated a significant p-value at 1%, showing that the fixed effects model was the best to test the hypotheses. In order to test the correlation between the variables, the command *pwcorr* was used in the software Stata® Statistic. The results did not show a correlation greater than 0.60, indicating no high correlation among the variables. Finally, to verify the normality of the residues, the Jarque Bera test was performed (H0: normality of the residues). As the p-value was greater than 5% for all equations, the null hypothesis was accepted. Therefore, the assumption of normality was met.

4 RESULTS

Table 2 shows the value of intangibles recognized in business combinations and their representativeness in proportion to the companies’ total intangible assets:-

Table 2

Recognized intangibles recognized in business combinations (values in million BRL)

Recognized intangibles	Goodwill		Identified intangibles		Total intangibles
	Year	Value	(%)	Value	(%)
2010	80,248,099	23.03	9,523,063	2.73	348,425,900
2011	98,348,688	23.93	30,053,103	7.31	410,972,360
2012	102,481,217	23.69	24,279,516	5.61	432,526,522
2013	137,213,352	29.69	26,246,149	5.68	462,165,896
2014	151,746,325	30.33	28,220,672	5.64	500,328,677
2015	195,744,655	32.07	34,720,385	5.69	610,333,624
2016	180,975,319	29.72	32,367,924	5.32	608,851,958
2017	185,735,788	29.70	37,944,293	6.07	625,327,809

Source: Research data.

Table 3 shows the descriptive statistics of the variables used. The average goodwill (GOOD) is higher than the identified intangibles (IIA). The amounts allocated to goodwill are higher, corroborating the study by Eloy and Souza (2018).

Table 4 shows the relevance of intangibles recognized in business combinations (Equations 1to 4).

Table 5 shows the results of Equation 5, in which recognized intangible assets by nature were segregated.

Table 3
Statistical Description of Variables

Variables	Mean	Standard deviation	Minimum	Maximum
MV	15.0261	12.9362	0.0195	69.9426
NE	8.4442	6.7694	-6.8828	38.4957
NE-COMB	6.1735	6.4259	-9.1048	32.9232
NE-GOOD	6.5154	6.4159	-9.1048	32.9232
NE-IIA	4.2447	7.2194	-18.0839	32.8398
NI	0.5132	1.2238	-4.4216	5.6700
COMB	2.2707	3.1331	0.0004	24.1667
GOOD	1.9288	2.6155	0	16.0233
IIA	0.3419	1.0808	0	15.0825

Source: Research data.

Table 4
Value relevance of recognized intangible assets in business combinations

Columns	1		2		3		4	
Variables	Coeff.	Stat.T	Coeff.	Stat.T	Coeff.	Stat.T	Coeff.	Stat.T
NE	0.5951	6.22***						
NE-COMB			0.4887	4.31***				
NE-GOOD					0.4910	4.32***		
NE-IIA							0.1881	1.82*
NI	3.0115	10.09***	3.0870	10.25***	3.0776	10.24***	3.3741	11.10***
COMB			0.8029	5.25***				
GOOD					0.8781	4.55***		
IIA							1.4158	3.18***
Constant	8.4557	10.30***	8.6015	10.44***	8.5538	10.41***	12.0119	21.41***
R-sq Within	0.2364		0.2402		0.2400		0.2014	
R-sq Between	0.4162		0.4647		0.4598		0.4533	
R-sq Overall	0.3676		0.4011		0.3989		0.3503	
F Test	92.71***		63.02***		62.95***		50.26***	
N	733		733		733		733	

Source: Research data.***, **, * significance of 1%,5%, and 10%.

Table 5
Value relevance according to the nature of recognized intangible asset in a business combination

Panel A		
Variables	Coefficient	Statistic t
NE-COMB	0.5376	4.69***
NI	2.9717	9.98***
GOOD	0.7199	3.22***
ADDV	7.6850	4.39***
PAT	-113.1318	-2.76***
LIC	1.0799	1.48
FUND	67.1396	1.34
SOFT	-4.6666	-1.73*
RIGHT	2.3548	1.87*
CONTR	31.0572	1.28
PORT	1.1818	0.68
BRAND	-1.5339	-1.19
OTHER	2.2780	0.57
Constant	8.5045	10.28***
Panel B		
R-sq Within	0.2858	F-Statistic
R-sq Between	0.3120	
R-sq Overall	0.3609	N
		733

Source: Research data.***, **, * significance level 1%,5%, and 10%.

5 RESULTS ANALYSIS

As shown in Table 2, both the value of goodwill and the value of identified intangibles have grown over the years. The total value of the intangible also increased over the years, except in 2016, when it decreased. This reduction was mainly caused by goodwill. An increase can be seen in the identified intangibles compared to 2010 and 2011, from 2.73% to 7.31%, suggesting that after the effective date of CPC 04 Intangible Assets (R1, 2010) and CPC 15 (R1, 2011), on business combinations, companies have changed the accounting method.

However, the amount paid in excess of the book value by companies in business combinations when segregated into goodwill and identified intangibles does not have the same proportion of recognition. For example, in 2014, goodwill increased by approximately BRL 14.5 billion, while intangibles identified BRL 1.9 billion. These values suggest two things. Either the companies are recognizing a larger portion of the amount paid in goodwill, or the assets' fair value and book value are becoming similar, thus fulfilling one of the goals of the adoption of international standards. i.e., to approximate the accounting value to the market value of the assets.

Despite the representativeness of goodwill in the intangible assets (between 23.03% and 32.07%), identified intangibles presented a greater growth. When comparing the growth of the two intangibles from 2010 to 2017, identified intangible assets grew 298.45% while goodwill grew 131.45%. It is noteworthy that identified intangible assets can be amortized when their useful lives are defined, which does not occur for goodwill (indefinite useful lives). However, goodwill is subject to impairment.

In 2016, for example, goodwill impairment reached BRL 15 billion, which may have occurred due to the loss from the value recovery or due to investment discontinuity (given that identified intangibles also decreased). The economic and political crisis in Brazil in 2016 may explain this phenomenon, contributing to the recoverable value of future benefits from goodwill impairment.

The telecommunication sector can be highlighted among the industries researched. It presented two significant increases in 2011 and 2015. This increase was due to the acquisition of Vivo Participações SA by Telefônica Brasil SA in 2011, which generated goodwill of BRL 9.2 billion. In 2015, Telefônica Brasil SA acquired GVT Participações, recognizing goodwill of BRL 12.8 billion. Vivo's acquisition by Telefônica Brasil S.A. also led the company to recognize intangible assets (brand, customer portfolio, and licenses) in an approximate amount of BRL 17 billion.

Brands, followed by customer portfolios, were the most recognized items in business combinations. In 2015, with the purchase of GVT, Telefônica Brasil S.A. recognized BRL 59 million in brands and BRL 2.5 billion in customer portfolios. It also recognized software and other intangibles. In 2014, Kroton Educacional SA recognized BRL 1.8 billion brand gain and BRL 273 million in customer portfolios, in addition to BRL 5.3 billion referring to goodwill, when it acquired Anhanguera Educacional Participações SA. Kroton also recognized software and other intangibles.

Due to the high values recognized in a business combination, checking value relevance to the market value demonstrates how users consider this accounting information in decision-making.

Ohlson's model (1995; 2005) was significant at the 1% level, as observed in the F-Test so that at least one of the model's variables has a non-zero coefficient (Table 4, Column 1). Both net equity and income coefficients were significant, according to the T-Test, at the

level of 1%. Both are positively related to the market value and explain 36.76% of Brazilian companies' market value.

The incremental power of recognized intangible assets in a business combination was increased by 3.35 percentage points (Table 4, Column 2). The COMB variable was significantly and positively related to market value, demonstrating that recognized intangibles in a business combination, whether identified or not, are relevant to the stock market, so hypothesis 1 is confirmed.

When a business combination occurs, the amount paid in excess that cannot be allocated to a specific item ends up being associated with goodwill, named, among others, as synergy or future profitability. Column 3 demonstrates the value relevance of goodwill. The incremental power of goodwill increased by 3.13 percentage points when compared to Column 1, so that goodwill, whose coefficient is positive and significant at 1%, influences the market value together with NE-GOOD and NI. Thus, goodwill is positively related to market value, and hypothesis 2 is confirmed. This result corroborates the international studies by Henning *et al.* (2000), Jennings *et al.* (1996), and Su and Wells (2015). It contradicts the national findings of Carlos Filho *et al.* (2013) and Souza and Borba (2017).

The divergence with the findings of Souza and Borba (2017) may result from the period investigated. The authors analyzed the period from 2010 to 2013, while this study focused on 2010 to 2017. Therefore, it is possible to assume that goodwill value has gained relevance as the fair value approaches book value, as seen in recent years. Another explanation may be that this study focused on the companies, while Souza and Borba (2017) examined the business combinations.

In addition to goodwill, when conducting a business combination, a company may recognize other intangibles (including intangibles that were not previously recognized). Hypothesis 3 refers to the recognized identified intangibles. Column 4 (Table 4) presents the results for this hypothesis.

The identified intangible assets are positively related to the market value and significant at 1%, confirming hypothesis 3. This result corroborates the findings by Tunyi *et al.* (2019) regarding adopting international standards. This study showed that, in Brazil, intangibles proved to be positive and statistically significant after adopting international standards, which contradicts the findings by Souza and Borba (2017). However, the incremental power was reduced by 1.71 percentage points. The recognized intangible assets were segregated in order to understand this reduction (Equation 5).

Five of the 11 intangible assets were significant (Table 5), so that hypothesis 4 is partially rejected. Goodwill coefficient decreases when associated with other intangible assets recognized in business combinations (from 0.8781 to 0.7199). However, it continues to be statistically significant at 1% confidence level and positively related to the market value.

The amounts of unspecified nature recognized in business combinations were allocated as added value. The significance of added value suggests that the stock market considers recognizing intangibles, making no distinction among the different types of intangibles. As for recognizing rights and concessions, this item induces the market to produce contracts that attribute more benefits than stipulated, which is relevant at the time of the business combination. It may even be linked to the acquirer's strategies, leading the stock market to attribute greater value relevance (King *et al.*, 2019).

Although significant, the variable software was negatively related to market value, suggesting that this recognized intangible may turn into a profitable technology or into a system that does not add market value. The patent shows a similar pattern. Its high and negative coefficient can be due to the amortization expense recorded, damaging the future result, reducing dividends, and changing the investor's perception of that company. Therefore,

even if these intangibles are aligned with the company's strategy, the organization has a cost to maintain them.

Table 5 shows that not all types of intangibles are considered relevant to the market value since some were not statistically significant at the level of 10%. This is the case for licenses, brands, and customer portfolios, which were not significant for the stock market despite having high recognized values.

Su and Wells (2015) offer a possible explanation, demonstrating that identified intangibles may not contribute to future performance post-acquisition. Thus, even though identifying an intangible, this asset may not be aligned with the acquirer's strategy or, as discussed by King *et al.* (2019), continuous disbursement is needed to maintain or increase its value. As a result, future cash flows are affected by the uncertainty of the economic benefit's continuity and the fair value at the time of acquisition (King *et al.*, 2019).

These results contradict the findings by Souza and Borba (2017) and suggest that intangible assets recognized in business combinations are relevant to the market value. They partially support the statement by Carlos Filho *et al.* (2013) that the market considers the intangibles as relevant for decision-making but does not distinguish the type of intangible assets recognized.

With the adoption of standards and changes in legislation on business combinations, the main change is recognizing the acquired company's assets at fair value so that the identified intangible assets in business combinations are now close to their market value. Over the years, the identified intangibles and those not identified and allocated as goodwill grew in the same proportion. The research findings differed from national studies (Carlos Filho *et al.*, 2013; Herculano & Piccoli, 2016; Souza & Borba, 2017) since goodwill proved to be significant and related to market value. However, contrary to the findings of Kimouche and Rouabhi (2016), the coefficient did not prove to be superior to the other intangibles, when analyzed separated according to the nature of the intangibles (Equation 5). The identified intangibles were relevant to the market value, contrary to the finding by Souza and Borba (2017). However, when they were separated by the nature of the intangible, some types were more relevant than others, so that, even though they are statistically significant, some are not related to the market value, as is the case with patents and software.

The results demonstrated that even though the company does not specify which item of intangible was recognized (ADDV), the information is relevant for market value. Thus, it is possible to infer that the stock market looks at this information to invest but does not consider relevant the type of intangible recognized.

One explanation for some items not being relevant is how these assets are recognized since they are measured at fair value. The assumptions and judgments made at the time of the business combination are essential to define the value. However, as pointed out by King *et al.* (2019), in order to maintain the benefit of these assets, a series of payments is required, for example, brand advertising or replacement software and patents.

6 FINAL CONSIDERATIONS

Value relevance studies explain the behavior of stocks through accounting variables (Macedo *et al.*, 2011). This study sought to verify the relevance of the recognized intangible assets in business combinations of Brazilian listed companies.

With a sample of 131 companies on the Brazilian stock exchange during the period 2010 to 2017, it can be concluded that the Brazilian market demonstrated that, when companies carry out business combinations, they contribute to the market value so that the registered intangibles, identified or not, are value relevant. Although some items are not

relevant, intangible assets in general, regardless of nature, are relevant to the stock market and contribute to market value.

The research contributed in a practical way, indicating to managers that recognizing an identifiable intangible asset in a business combination adds market value. Although the amount of consideration allocated to identified intangible assets increased from 2010 to 2017, managers need to make greater effort so that these intangibles are identified and measured, reducing the amount allocated to goodwill.

The theoretical contribution consists of aggregating studies on value relevance of business combinations, adding information about recognized intangible assets, especially identifiable ones. The results support that intangible asset recognized in business combinations are relevant to the market, coinciding with the international literature, and refuting national research.

The study is limited by the period analyzed and the information disclosed in the explanatory notes indicating that the values referred to a business combination. It is also limited to the values that diverged between the Balance Sheet and the explanatory notes, and to the collection software, Economatica®, which did not present the market value of 114 observations. Future research could focus on analyzing the value relevance of financial companies that usually acquire many companies per year, which items these firms recognize in business combinations, and verify the value relevance of other recognized items, such as fixed assets and provisions.

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Relevância dos Ativos Intangíveis Reconhecidos em uma Combinação de Negócios

RESUMO

Objetivo: verificar a relevância dos ativos intangíveis reconhecidos em uma combinação de negócios das companhias de capital aberto brasileiras.

Método: A amostra composta por 165 empresas, abrangendo 962 observações, foi analisada no período de 2010 a 2017 por meio de cinco regressões de dados em painel com base no modelo de Ohlson (1995; 2005) para testar as quatro hipóteses formuladas.

Originalidade/Relevância: Estudos sobre value relevance analisaram sobre o goodwill, mas há campos ainda não preenchidos, de modo que o estudo preenche a lacuna sobre a relevância dos intangíveis reconhecidos em uma combinação negócios para o mercado acionário, explorando outras naturezas dos intangíveis reconhecidos em combinação de negócios, além do goodwill. Além disso, em 2015 a IFRS 3 entrou em discussão, tornando a visão do mercado acionário e a aplicação da norma foco da pesquisa contábil.

Resultados: Os resultados apontaram que o goodwill representa de 23 a 30% do ativo intangível registrado no Balanço Patrimonial, enquanto os intangíveis identificados em torno de 5,6%. Quanto à relevância observou-se que tanto o valor dos ativos intangível reconhecido, como quando segregado em goodwill e ativo intangível identificado, se mostraram significativos e positivamente relacionados com o valor de mercado. Com relação à natureza dos intangíveis reconhecidos em combinação de negócios, alguns se mostraram relacionados ao valor de mercado.

Contribuições teóricas/metodológicas: A pesquisa adiciona a literatura de value relevance sobre combinação de negócios permitindo compreender que são relevantes para o mercado acionário, de modo que contribuem para o valor de mercado das companhias brasileiras.

Palavras-chave: Combinação de negócio; Ativo intangível; Value relevance.

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