Financing R&D and Innovation - New Tools and Approaches

The goodwill relevance in cash flow forecasting – the Portuguese case

Isabel Alexandra Neves Maldonado

REMIT – Research on Economics, Management and Information Technologies, Universidade Portucalense and GOVCOPP – Research Unit on Governance, Competitiveness and Public Policies, Universidade de Aveiro

ianm@uportu.pt

Joaquim Carlos da Costa Pinho

GOVCOPP – Research Unit on Governance, Competitiveness and Public Policies, Universidade de Aveiro

cpinho@ua.pt

Abstract:

This study aims to analyse in what extent goodwill and goodwill impairment losses are relevant to the cash flows forecasting in Portugal. We explore the goodwill and goodwill impairments losses forecasting ability to predict cash flows using multiple linear regression models with one-year-ahead cash flows as a dependent variable in each regression model and including the goodwill and goodwill impairment losses in the independent variables. Our sample includes Portuguese companies consolidated annual reports belonging to the PSI-20 index and covers the period between 2010 and 2017. Regression results from the estimated models show that our key variable goodwill is statistically significant, indicating that the goodwill have significant predictive ability for one-year ahead cash flows being an important variable to consider by the users of financial statements in forecasting future cash flows and in making economic decisions. The reported goodwill Impairment losses results reveal a significative and negative sign for its estimated coefficient. However, the estimated coefficient on goodwill is negative, raising the question whether the goodwill reported by Portuguese entities is really perceived as an "productive asset" or not.

Keywords: Cash flow forecasting, Goodwill, Goodwill impairment.

1 Introduction

The use of International Financial Reporting Standards (IFRS) in the European Union (EU) has become mandatory in 2005 for all companies with securities admitted to listing on the EU stock exchange market when preparing their consolidated accounts. This imposition has led

to the development of a multiplicity of studies seeking to analyse the economic and financial consequences of this mandatory adoption and the benefits for users of financial statements.

Among the standards that caused the greatest changes in reporting we find the IFRS – 3 Business Combinations establishing the rules for the accounting when an acquirer obtains control of a business, defining the use of the acquisition method, which generally requires assets acquired and liabilities assumed to be measured at their fair values at the acquisition date. According to the International Accounting Standards Board (IASB), "IFRS 3 seeks to enhance the relevance, reliability and comparability of information provided about business combinations (e.g. acquisitions and mergers) and their effects. It sets out the principles on the recognition and measurement of acquired assets and liabilities, the determination of goodwill and the necessary disclosures".

The IFRS 3 – Business Combinations define the concept of goodwill and established procedures for conducting impairment tests. Its implementation is mandatory as a result of the effort to harmonise international goodwill accounting and improve the quality of the information transmitted in the financial statements. The establishment of impairment tests (and non-amortization) was criticized and widely debated among those that defended the impairment testing and those that defended the systematic amortization of goodwill, arguing the last group that managers would face strong resistance to impairment testing, leading to poor expression of impairment losses and the indefinite maintenance of the value of goodwill as companies' intangible assets. Several studies suggest that this is in part induce by the management tendency to avoid recognition of impairment losses (Ramanna and Watts 2012; Andre et al. 2015; Filip et al. 2015; Stenheim and Madsen 2016; Li and Sloan 2017; Ayres et al. 2018). Even recently in Portugal, and as regards individual accounts, in 2016, this mandatory impairment test (and non-amortization) was changed, with goodwill now being measured at cost less accumulated amortization, less accumulated impairment losses.

In this context, several empirical studies try the assess the relevance of goodwill and goodwill impairments accounting treatment and consequent impact on the economic and financial information disclosed by listed companies. The research on goodwill and goodwill impairment losses has followed different orientations, and studies have been found on the accounting impact of applying new rules, on the reaction of the capital markets, on the impact in the decisions of non-capital market information users, among others.

Several authors focus on the analysis of the market reaction to the goodwill and goodwill impairment losses recognized in companies' financial statements trying to access the statistical significance of the recognition of goodwill in explaining stock price behaviour (Oliveira et al. 2010; AbuGhazaleh et al. 2012; Qureshi and Ashraf 2013; Hamberg and Beisland 2014; Fernandes and Gonçalves 2014; Vallius 2016; Fernandes et al. 2016; Bilal and Abdenacer 2016; Souza and Borba 2017; Maldonado et al. 2019).

Other studies analysed the importance of goodwill and goodwill impairment losses for the different users of financial statements in forecasting future cash flows and in making economic decisions (Barth et al. 2001; Jarva 2009; Lee 2011; Bostwick et al. 2016; Amorós-Martínez and Cavero-Rubio 2018; Choi and Nam 2018).

Following this second research field and aiming to contribute to fill the gap left by the existence of few studies in the European context, this study aims to analyse in what extent

goodwill and goodwill impairment losses are relevant to the cash flows forecasting in Portugal. Our sample includes Portuguese companies' consolidated annual reports belonging to the PSI-20 index and covers the period between 2010 and 2017.

In addition to this introduction of the theme, this article presents in chapter 2 a brief literature review and research hypotheses. In chapter 3 methodology is presented, chapter 4 displays the data and summarizes the main results and chapter 5 concludes.

2 Literature review and hypothesis

Corresponding the goodwill to future economic benefits resulting from assets that are not capable of being individually identified and separately recognized, under the terms of the Portuguese NCRF 14 – Business Combinations and IFRS 3 – Business Combinations, several are the empirical studies that focus the attention on the goodwill accounting treatment and its consequent impact on the economic and financial information disclosed by listed companies. Among the focused aspects we highlight the research on goodwill and goodwill impairment losses accounting treatment and consequent impact on the economic and financial information disclosed by listed companies.

We can find in the literature several studies that emphasize the capital markets reaction to the goodwill and goodwill impairment losses recognized in companies' financial statements. In fact, in the 1980s and 1990s, studies such as Elliott and Shaw (1988) and Francis et al. (1996) concluded that markets did not have any kind of reaction to goodwill impairment loses. Recent studies as Dahmash et al. (2009), Oliveira et al. (2010), Xu et al. (2011), AbuGhazaleh et al. (2012), Qureshi and Ashraf (2013), Fernandes and Gonçalves (2014), Bilal and Abdenacer (2016) and Maldonado et al. (2019) point out that identifiable intangible assets and goodwill contribute positively to the stock price. However, Hamberg and Beisland (2014) and Vallius (2016) conclude that there is no relationship between the value of goodwill and the market value per share. Regarding the goodwill impairments, Bens et al. (2011), Fernandes and Gonçalves (2014) and Fernandes et al. (2016) find a symmetrical relationship between the stock market price and the goodwill impairments.

With regard to the importance of goodwill and goodwill impairment losses in forecasting future cash flows and in making economic decisions and according to Bostwick et al. (2016, p.339) "The accounting profession has long recognized that cash flow prediction is one of the fundamental uses of financial information (…). However, goodwill information is often ignored in cash flow prediction models". In this context, this study will address the importance of goodwill and goodwill impairment losses for the different users of financial statements when forecasting financial indicators, namely future cash flows in line with the research of authors as Jarva (2009), Lee (2011), Lee and Yoon (2012), Bostwick et al. (2016), Amorós-Martínez and Cavero-Rubio (2018), Choi and Nam (2018), among others.

In order to access if the goodwill write-offs recognized in accordance with the American SFAS 142 (Statement of Financial Accounting Standards 142 – Goodwill and Other Intangible Assets) are associated with future expected cash flows as mandated by the standard, Jarva (2009) study the hypothesis if goodwill write-offs are positively associated with expected future cash flows for companies listed on the New York (NYSE), American (AMEX) and NASDAQ markets that reported goodwill impairments between 2002 and 2005. The variable goodwill

impairments were introduced as a negative value; therefore, a positive association imply that more negative write-offs lead to more negative expected future cash flows. According with Jarva (2009) regression results, the estimated coefficients on goodwill write-offs are statistically significant and positive for one- and two-year-ahead cash flows, lead to the conclusion that goodwill write-offs are associated with future expected cash flows.

Lee (2011), Lee and Yoon (2012) and Bostwick et al. (2016) also examine the efficacy of SFAS 142 in USA by focusing on the projection of cash flows. As point out by Lee (2011, p.241), "forecasting future cash flows is an important benchmark for the usefulness of accounting information" and his results show that the ability of goodwill to predict future cash flows has improved since the Financial Accounting Standards Board (FASB) adopted SFAS 142.

With a sample of US firms for a time frame from 1995 to 2006, Lee (2011) regression results show that the coefficient for the goodwill present on financial statements is positive and significant, suggesting that SFAS 142 "improves the informativeness of goodwill in terms of its ability to predict future cash flows by reflecting the underlying economics of those assets" (Lee, 2011, p.250).

Testing how goodwill accounting influences persistence of earnings for testing reliability issue of SFAS and whether goodwill accounting affects earnings' ability to predict future cash flows for testing relevance dimension, Lee and Yoon (2012) study was developed for a sample of US companies and for the period from 1995 to 2006. The same conclusion as Lee (2011) is reached by Lee and Yoon (2012, p.125), whose findings indicate that the "ability of earnings to predict the future operating cash flows and earnings persistence significantly improved post-SFAS No. 142 compared to the firms unaffected by the statement".

Addressing the impact of goodwill impairments on cash flow forecasting and also for US companies, Bostwick et al. (2016) test if goodwill impairments provide a significant, incremental improvement in the prediction and forecasting of future cash flows for a time horizon from 2001 to 2009. The authors find that goodwill impairments are inversely related to future cash flows and that the inclusion of goodwill impairments improves the prediction of future cash flows.

Using a sample of Korean listed firms, Choi and Nam (2018) examine the abilities of goodwill and its impairment write-offs in predicting future expected cash flows, also finding that goodwill and goodwill impairments have a significant predictive ability for expected future cash flows up to two-year-ahead cash flows. Choi and Nam (2018) results indicate that goodwill and goodwill impairments are positively associated with future expected cash flows. However, when testing the if the predictive ability differs between firms recognizing impairments based on normal and discretionary motives, "the analysis reveals that discretionary impairment recognition tends to amplify the ability of goodwill balance and goodwill impairment write-offs to predict future expected cash flows with negative and positive relations respectively" (Choi and Nam 2018, p. 83).

In the European context, we only found a study for the Spanish market. Seeking to assess the effects of the mandatory adoption of IFRS 3 in 2005 for all companies with securities admitted to listing on the EU stock exchange market when preparing their consolidated accounts, Amorós-Martínez and Cavero-Rubio (2018) use a random sample of annual consolidated balance sheets from 85 companies extracted from the total companies listed in the Spanish

securities market. The regression results lead to the conclusion that the goodwill regulation of IFRS affects the financial information transmitted by companies and that goodwill and goodwill reduction explain future cash flows: goodwill has a negative and significant association with future cash flows and goodwill impairments has a positive association with future cash flows.

Aiming to contribute to fill the gap left by the existence of few studies in the European context, this study aims to analyse in what extent goodwill and goodwill impairment losses are relevant to the cash flows forecasting in Portugal.

In this context and based on the literature previously mentioned, we formulated our research hypothesis establishing the relationship between the dependent variable one-year ahead cash flow and the reported Goodwill and Goodwill impairment losses at the end of the previous year:

H1: There is a significant relationship between to the goodwill reported in companies' financial statements and future cash flows.

H2: There is a significant relationship between to the goodwill and goodwill impairment losses reported in companies' financial statements and future cash flows.

Based on the approaches followed by Lee (2011) and Choi and Nam (2018), we will explore the goodwill and goodwill impairments losses forecasting ability to predict cash flows using multiple linear regression models with one-year-ahead cash flows as a dependent variable of each regression model and including the goodwill and goodwill impairment losses in the independent variables.

3 Methodology

In order to gather evidence if the goodwill and goodwill impairment losses are relevant to the cash flows forecasting in Portugal, we followed the methodology proposed in previous studies, adapting the Feltham and Ohlson (1995) model in order to highlight the information relating to goodwill and goodwill impairment losses. This way, we assume the existence of a relationship between future cash flows with companies' book value, goodwill and goodwill impairment losses.

The hypothesis analysis was carried out by extending the following model:

$$CF_{i,t+1} = \beta_0 + \beta_1 CF_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where the dependent variable is $CF_{i,t+1}$, the Cash-flow for company i at the end of year t+1, and the independent variable $CF_{i,t}$ represents the Cash-flow for company i at the end of the previous year t.

In order to test the goodwill and goodwill impairments losses forecasting ability to predict cash flows, we expanded the base model incorporating the following independent variables:

- GWi,t representing the reported goodwill for company i at the end of the previous year t;

- Imp_GWi,t representing the reported goodwill Impairment loss for company i at the end of the previous year t;
- CP_GWi,t representing the reported equity minus goodwill for company i at the end of the previous year t.

The models obtained constituted the basis for testing the previously established research hypotheses. Model I, defined as:

Model I:

$$CF_{i,t+1} = \beta_0 + \beta_1 CF_{i,t} + \beta_2 GW_{i,t} + \varepsilon_{i,t} \quad (2)$$

allow to test the existence of relationship between to the goodwill reported in companies' financial statements and future cash flows (H1).

The relationship between to the goodwill and goodwill impairment losses and future cash flows (H2), will be tested thru Models II and III:

Model II:

$$CF_{i,t+1} = \beta_0 + \beta_1 CF_{i,t} + \beta_2 GW_{i,t} + \beta_3 Imp\_GW_{i,t} + \varepsilon_{i,t} \quad (3)$$

Model III:

$$CF_{i,t+1} = \beta_0 + \beta_1 CF_{i,t} + \beta_2 GW_{i,t} + \beta_3 Imp\_GW_{i,t} + \beta_4 CP\_GW_{i,t} + \varepsilon_{i,t} \quad (4)$$

The dependent and independent variables were deflated by total sales as proposed by Lee (2011), that justifies this option on the premise that this figure is less susceptible to a firm's endogenous reporting or investment decision related to goodwill.

4 Data and results

The sample in this study comprises companies belonging to the Portuguese PSI-20 index. From the initial sample of 20 companies that are part of the PSI-20, the entities belonging to the banking sector were excluded, as well as those that do not reported goodwill in their financial statements. This has resulted in the extraction of the 14 entities that report goodwill in their financial statements in the period from 2010 to 2017.

The data collected was obtained through the SABI database and the missing elements were obtained directly from the reports and accounts of the entities in question. It should be noted that we exclude all banking entities due to the specificity of the accounting regulations adopted by these entities.

The analysed entities were grouped according to the ICB Sectorial Classification – Industry, corresponding to the following sectors in table 1: Basic Materials, Industrials, Consumer Goods, Consumer Services, Utilities, Financials, Oil and Gas.

Table 1 also presents the goodwill relative weight on total assets (GW Relative Weight) with reference to the year 2017. Of the companies with the largest relative weight of goodwill, the most significant are: Ramada from the Basic Materials sector (21,94%), Mota Engil from the Industrial sector (21,25%), Ibersol from Consumer Services (15,30%) and Galp Energia from Oil and Gas sector (15,47%).

The dependent variable is the cash flow for company i at the end of year t+1. The main independent variables represent cash flow for company i at the end of the previous year t, goodwill for company i at the end of the previous year t, goodwill impairment losses for company i at the end of the previous year t and equity minus goodwill for company i at the end of the previous year t. All variables were deflated by total sales.

Table 1

ICB Sectorial Classification and GW Relative Weight on total Assets – 2017

			ICB Relative Weight	GW Relative Weight
Ramada	1000	Basic Materials	21,43%	21,94%
Semapa	1000	Basic Materials		1,13%
Navigator Companie	1000	Basic Materials		0,59%
Altri SGPS	2000	Industrials	21,43%	5,31%
CTT Correios de Portugal	2000	Industrials		0,68%
Mota Engil	2000	Industrials		21,25%
Corticeira Amorim	3000	Consumer Goods	7,14%	0,82%
Ibersol, SGPS	5000	Consumer Services	21,43%	15,30%
NOS, SGPS	5000	Consumer Services		0,40%
Sonae, SGPS	5000	Consumer Services		0,36%
EDP	7000	Utilities	14,29%	8,83%
REN	7000	Utilities		11,32%
Sonae Capital	8000	Financials	7,14%	9,18%
Galp Energia	0001	Oil and Gas	7,14%	15,47%

Note: The table presents the sectorial classification of the 14 companies in the sample as well as their relative weight. The proportion of goodwill in relation to the total assets of each entity as at 31 December 2017 is also shown.

Table 2 presents the descriptive statistics for the variables used in the regression analysis of the relevance of goodwill and goodwill impairment in cash flow forecasting. The analysis shows an average goodwill deflated by total sales of 0,1487632€, with a maximum of 0,5539464€. The reported goodwill impairment losses deflated by total sales presents a mean value of 0,00185€, with a maximum of 0,1204819€. We also note an average reported equity minus goodwill deflated by total sales of 0,5877024€, with a minimum of -0,3105461€ and a maximum of 2,885043€.

Table 2

Descriptive statistics

	Mean	Std. Dev.	Min	Max
$CF_{i,t}$	0,1940661	0,3443326	-0,4632616	1,818797
$GW_{i,t}$	0,1487632	0,1516151	0	0,5539464
$Imp\_GW_{i,t}$	0,00185	0,0123716	0	0,1204819
$CP\_GW_{i,t}$	0,5877024	0,5974586	-0,3105461	2,885043

NOTE: Table reports the Descriptive statistics for the variables $CF_{i,t}$ representing the cash flow for company i at the end of the previous year t, GW i,t representing the reported goodwill for company i at the end of the previous year t, Imp_GWi,t representing the reported goodwill impairment loss for company i at the end of the previous year t and CP_GWi,t representing the reported equity minus goodwill for company i at the end of the previous year t.

Table 3 provides the Pearson correlation matrix, which summarizes the nature and the level of different associations between variables. All variables have positive correlations with the independent variable cash flow at the end of year t+1, being the most significant positive correlation the one of equity minus goodwill of the previous year. We also note the correlations between previous year reported goodwill and goodwill impairment loss, reinforcing the conclusions of some previous studies of an existing correlation between cash flows and goodwill/goodwill impairment losses, present in companies' financial statements.

Table 3

Pearson correlations

	$CF_{i,t+1}$	$GW_{i,t}$	$Imp\_GW_{i,t}$	$CP\_GW_{i,t}$
$CF_{i,t+1}$	1,0000			
$GW_{i,t}$	0,0651	1,0000		
$Imp\_GW_{i,t}$	0,0773	-0,0045	1,0000	
$CP\_GW_{i,t}$	0,4923	-0,2863	0,1344	1,0000

NOTE: Table reports the Pearson correlations for the variables $CF_{i,t+1}$ representing the cash flow for company i at the end of year t+1, GWi,t representing the reported goodwill for company i at the end of the previous year t, Imp_GWi,t representing the reported goodwill impairment loss for company i at the end of the previous year t and CP_GWi,t representing the reported equity minus goodwill for company i at the end of the previous year t.

To estimate the parameters corresponding with the variables we employ the Arellano and Bond (1991) generalized method of moments (GMM) estimator. Table 4 reports the results for Arellano–Bond dynamic panel GMM two step estimator related to the ability of goodwill to predict future cash flows (Model I), goodwill and goodwill impairments (Model III) and goodwill, goodwill impairments and equity (Model III). The Sargan test results confirm the null hypothesis for the tree models and reveal that the over-identifying restrictions are valid, assessing the model's robustness. The Arellano-Bond tests for serial correlation not detect any serial correlation problem in the residuals.

The estimated coefficient on goodwill is statistically significant and negative for one year ahead cash flow, the opposite of Lee (2011) and Lee and Yoon (2012) results that indicate a positive and significant association between goodwill charge and future cash flows in the period post-SFAS 142. However, consistent with the results of Amorós-Martínez and Cavero-Rubio (2018) for the Spanish case and post- IFRS 3 period. This finding is also partly consistent with Choi and Nam (2018) that also found a negative coefficient for goodwill implying that entities who report larger goodwill values in their financial statements tend to achieve lower futures cash flows, raising the question whether reported goodwill by Portuguese entities is really perceived as a "productive asset" or not.

Table 4

Model Estimation Results

	Model I					Model II					Model III				
$CF_{i,t+1}$	**Coef.**	**Std. Err.**	**z**	**P-value**		**Coef.**	**Std. Err.**	**z**	**P-value**		**Coef.**	**Std. Err.**	**z**	**P-value**	
CF i,t	0,733	0,006	116,16	0,000	***	0,612	0,007	93,21	0,000	***	0,536	0,010	51,57	0,000	***
$GW_{i,t}$	-0,838	0,010	-83,60	0,000	***	-0,956	0,015	-63,79	0,000	***	-0,715	0,022	-32,88	0,000	***
$Imp\_GW_{i,t}$						-1,782	0,038	-47,11	0,000	***	-1,701	0,052	-32,50	0,000	***
$CP\_GW_{i,t}$											0,154	0,009	17,33	0,000	***
Const.	0,173	0,011	15,65	0,000	***	0,205	0,014	14,97	0,000	***	0,094	0,020	4,80	0,000	***
Wald test			101117,28 (2)	0,000				117366,14 (3)	0,000				241839,80 (4)	0,000	
Sargan test			12,388 (20)	0,902				11,771 (20)	0,924				11,691 (20)	0,926	
AR(2)			-1,347	0,178				-1,268	0,205				-1,453	0,146	

NOTE: The regression was performed using a data panel consisting of 14 companies and 112 observations for the period from 2010 to 2017. Table reports the Arellano-Bond dynamic panel-data estimation for Models I, II and III, where $CF_{i,t+1}$ represents the cash flow for company i at the end of year t+1, $CF_{i,t}$ represents the cash flow for company i at the end of the previous year t, $GW_{i,t}$ represent the reported goodwill for company i at the end of the previous year t, $Imp\_GW_{i,t}$ represent the reported goodwill impairment loss for company i at the end of the previous year t and $CP\_GW_{i,t}$ represent the reported equity minus goodwill for company i at the end of the previous year t. *,**,*** represent the coefficients which are statistically significant at the level of 10%, 5% and 1%, respectively. The Wald test has a p-value lower than 5% indicating that the set of coefficients is asymptotically distributed as $\chi 2$ under the null hypothesis without significance; the degrees of freedom are represented in parentheses. Sargan's test presents a p-value greater than 5% showing that the instruments are valid and the values between parentheses represent degrees of freedom. The Arellano-Bond test is distributed asymptotically as N (0,1) under the null hypothesis of no serial correlation; the AR test (2) indicates that there are no serial correlation problems.

Regarding the reported goodwill impairment losses, results reveal a significative and negative sign for its estimated coefficient, consistent with the Jarva (2009) and Bostwick et al. (2016) opinion that goodwill impairments are significantly and inversely related to one year ahead cash flow, but inconsistent with Amorós-Martínez and Cavero-Rubio (2018) and Choi and Nam (2018). Amorós-Martínez and Cavero-Rubio (2018) establish a positive relationship between the goodwill impairment losses and one-year ahead cash flows for the Spanish entities included in the sample and in the post-IFRS period. Choi and Nam (2018) also obtain a significative and positive relation between the goodwill impairment losses and one-year ahead cash flows for the Korean case.

Regression results for the tree models indicate that, as expected, current cash flow is a positive and significative predictor of one year ahead cash flow, in line with Jarva (2009), Lee (2011), Bostwick et al. (2016) and Amorós-Martínez and Cavero-Rubio (2018). Also, the reported equity minus goodwill coefficient presents itself with a positive and statistically coefficient pointing to its ability to assess future cash flows as in Amorós-Martínez and Cavero-Rubio (2018).

5 Conclusion

This study aims to analyse in what extent goodwill and goodwill impairment losses are relevant to predict future cash flows for Portuguese listed companies in the period from 2010 to 2017. The sample includes 14 entities belonging to the PSI-20 index that present goodwill in their balance sheet during the period under study.

The results confirm the findings of previous studies (Lee 2011, Bostwick et al. 2016, Amorós-Martínez and Cavero-Rubio 2017, Choi and Nam 2018) and our H1 hypothesis that there is a significant relationship between to the goodwill reported in companies' financial statements and future cash flows. However, the goodwill coefficient is negative for one year ahead cash-flow, contrary to the results of Lee (2011) and Lee and Yoon (2012) but consistent with Amorós-Martínez and Cavero-Rubio (2018) and partly in line with Choi and Nam (2018), raising the question whether reported goodwill by Portuguese entities is really perceived as a "productive asset" or not.

The goodwill impairment losses seem to be reflected in one-year ahead cash flows, in line with the most common tendency in the literature that establish a significant relationship between goodwill impairment losses and the future cash flows. Nevertheless, the results do not point in the same direction, being consistent with Jarva (2009) and Bostwick et al. (2016) but contrary to those obtained by Amorós-Martínez and Cavero-Rubio (2018) and Choi and Nam (2018). These results raise the need to expand the study, covering a broader sample of entities that report goodwill and goodwill impairments in their financial statements.

Also, the regression results for all models indicate that current cash flows and equity minus goodwill coefficients are positive and present themselves as significative predictors of one year ahead cash flow. The results of this study are important for several information users, such as investors in general and regulators, that use financial statements for forecasting future cash flows and in making economic decisions.

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