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The impairment test of goodwill: an empirical analysis of incentives for earnings management in Italian publicly traded companies

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ABSTRACT

Since the current International Accounting Standard 36 introduced substantial subjectivity while testing goodwill for impairment, this study aims to establish if management exploits the discretion and performs the impairment test of goodwill opportunistically. The presence of discretion, while applying impairment test, is tested on the sample of Italian publicly traded companies in the period of the current financial crisis. Despite the fact that the sample of companies consists of those with market to book ratio less than one, only 26% of the companies recorded a goodwill write-off. The logistic regression was used to test contracting and reporting incentives. The results of the analysis indicate that even in the case of IFRS users some incentives exist, while recognising the impairment losses of goodwill.

1. Introduction

In the International Financial Reporting Standards (IFRS 3) goodwill is defined as future economic benefits arising from assets acquired in a business combination that are not individually identified and separately recognised. Goodwill can be recognised in the financial statements only in cases of business combinations (internally generated goodwill, unconfirmed by a market transaction, cannot be recognised). In accordance with the accounting rules in IFRS, goodwill is (since 2004) no longer subject to amortisation, but instead, it has to be annually tested for impairment. On the day of its initial recognition, the value of goodwill is defined on the basis of the acquirer's payment; any subsequent measurement can only be based on accounting estimates. Since its value after initial recognition cannot be objectively defined, this accounting approach to goodwill is considered problematic.

As stated by Ramanna and Watts ([2011](#)), standard setters argue that the goodwill impairment process allows managers to convey private information. On the other hand, the agency

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theory (Jensen & Meckling, 1976; Fama & Jensen, 1983) suggests that managers will use unverifiability and manage financial reports opportunistically. In accordance with the agency theory, problems arise when the goals of the principal are in conflict with those of the agent and the two parties have asymmetric information.

There is a high degree of subjectivity, allowing for opportunistic behaviour among management when testing goodwill for impairment. Since the allocation of goodwill to cash-generating unit(s) (CGUs) and the calculation of the recoverable amount (when active prices are not available) of CGUs is subject to discretion (Carlin & Finch, 2010), studies suggest that management performs impairment testing of goodwill opportunistically (Segal, 2003; Beatty & Weber, 2006; Zang, 2008; Ramanna & Watts, 2011).

This study aims to perform an empirical analysis of incentives that might stimulate management to act opportunistically while performing the impairment test of goodwill. Such research based on IFRS users, particularly in times of financial crisis, is lacking. According to the theory, during times of crisis, management would have (due to poor business performance) higher incentives to form income at a desired level.

Most of the existing studies from the field of goodwill impairment testing were made on samples of US Financial Accounting Standards 142 (FAS 142) users. However, these studies cannot be generalised to IFRS users since findings have shown (Leuz, Nanda & Wysocki, 2003; Burgstahler, Hail & Leuz, 2006) that institutional factors have an important influence on the accounting reporting quality. Goodwill impairment testing between FAS 142 and IFRS is still not uniform; thus, it is worth examining the accounting discretion in the process of goodwill impairment testing in the case of IFRS users.

This study was performed on the sample of Italian publicly traded non-financial companies who prepare their annual accounts in accordance with IFRS, focusing on the period 2008–2010. Glaum, Schmidt, Street and Vogel (2013) indicate that the quality of IFRS financial statements differs between countries. The level of investor protection was found to be the most important factor of financial reporting quality (Leuz et al. 2003; Burgstahler et al. 2006). This is why our sample focuses on data from an environment with a low degree of investor protection.

The results of the empirical research indicate that in selected Italian companies, incentives exist, while recognising the impairment of goodwill. The likelihood of goodwill impairment is significantly affected by changes of management and management remuneration systems. On the other hand, we found as statistically non-significant those factors that derive from accounting standards and which facilitate discretion. The study contributes to the literature from the field of accounting choice in the environment of EU companies reporting under IFRS in times of financial crisis.

2. Theoretical background

The theoretical review of opportunistic discretionary choice research in the case of goodwill impairment provides evidence that the most common statistically significant incentives (reasons) for impairment of goodwill are: management tenure (Beatty & Weber, 2006; Ramanna & Watts, 2011) or changes of management (Guler, 2006; Masters-Stout, Costigan & Lovata, 2008; Zang, 2008), management's compensation system (Guler, 2006; Beatty & Weber, 2006; Ramanna & Watts, 2011), restrictive debt covenants (Beatty & Weber, 2006; Ramanna & Watts, 2011) or proportion of debt financing (Zang, 2008; Godfrey & Koh,

2009), and unexpectedly high (Segal, 2003; Van de Poel, Maijoor & Vanstelen, 2009) or unexpectedly low income (Guler, 2006; Cowan, Dilla & Jeffrey, 2006; Van de Poel et al., 2009; Maijoor & Vanstraelen, 2006). Incentives for the opportunistic impairment of goodwill are supported by the rules in accounting standards that allow opportunism. In the case of accounting for goodwill, these can be related to the number of formed CGUs (Lapointe-Antunes, Cormier & Magnan, 2008; Ramanna & Watts, 2011), and the share of unverifiable net assets (Ramanna & Watts, 2011).

Existing research has shown a link between incentives and factors that lead to opportunistic discretionary choice of goodwill in connection with the introduction of US FAS 142 (Segal, 2003; Cowan et al., 2006; Guler, 2006; Beatty & Weber, 2006; Zang, 2008; Ramanna & Watts, 2011). In the case of IFRS, the accounting treatment of goodwill in the first year of IFRS introduction was different[1] which makes these research findings not generalisable. In the European environment, this problematic domain, with an emphasis on companies reporting under IFRS, has only been dealt by Verriest and Gaeremynck (2009), Van de Poel et al. (2009), Lemans (2009), Hamberg, Paananen & Novak (2011), and AbuGhazaleh, Roberts & Hares (2011).[2]

Studies performed on the samples of large European companies reporting under IFRS and focusing on times of financial crisis are lacking.

Most studies of opportunistic discretionary choice regarding goodwill impairment analyse how incentives may lead to opportunism; only a few studies include (in addition to incentives) factors that allow discretion – the number of CGUs (using FAS: Beatty & Weber, 2006; Lapointe-Antunes et al., 2008; Ramanna & Watts, 2011; the use of IFRS: Verriest & Gaeremynck, 2009) and the proportion of unverifiable net assets (Ramanna & Watts, 2011; Shepardson, 2011). Factors that allow discretion derive from the characteristics of accounting standards.

2.1. *Contracting motives and opportunistic discretion*

Companies with more tight *debt covenants* are supposed to act more opportunistically, to avoid possible violations of covenants and thus incur higher cost of financing. Since, the inclusion/exclusion of goodwill in covenants is not often disclosed (Ramanna & Watts, 2011), authors often tend to use as a proxy the debt ratio (Zang, 2008; Godfrey & Koh, 2009) or financial leverage ratio (Hamberg et al., 2011). Only Beatty and Weber (2006) and Ramanna and Watts (2011) analysed the impact of covenant slack on goodwill impairment.

It is supposed that companies with higher debt ratio will have a lower financial slack and be more favourable to record lower impairments (Cotter, Stokes & Wyatt, 1998). In the survey performed by Easton, Eddey & Harris (1993), debt ratio proved to be one of the most important factors that influence the decision of chief executive officers about impairments of assets. On the basis of 82 Australian publicly traded companies Cotter et al. (1998) provided evidence that companies with higher debt ratios recorded lower impairments of long-lived assets.

Beatty and Weber (2006) were the first who explored the impact of debt covenants on discretion of goodwill impairments (in the case of FAS 142 implementation). Companies with less financial slack in net worth covenant threshold were less likely to record goodwill impairments. Ramanna and Watts (2011) applied a similar approach, but upgraded the research by including the periods after the introduction of FAS 142. The variable in use

was measured as the product of debt ratio and an indicator if the firm has a net worth or net income based debt covenant. The measure proved to be negatively associated with impairment losses of goodwill.

On the other hand, Zang (2008) used the (financial) leverage ratio as a proxy for debt covenants. Transitional impairment losses of goodwill proved to be relatively smaller for more highly leveraged firms. Lapointe-Antunes et al. (2008) established that those companies with higher than target (industry) leverage recorded lower transitional goodwill impairment losses (sample of Canadian companies).

Moreover, it is argued that management with a longer *tenure* is associated with lower impairments of goodwill (Beatty & Weber, 2006; Ramanna & Watts, 2011). Management with a longer tenure has probably made the original acquisition decision and is thus not well disposed to the recognition of goodwill impairment since it might suggest that the purchase price was too high. On the sample of American companies, both, Beatty and Weber (2006) and Ramanna and Watts (2011) confirmed the stated hypothesis. More often authors provided evidence that *chief executive officer changes* lead to higher impairments of goodwill (Zang, 2008; Masters-Stout et al., 2008; Lapointe-Antunes et al., 2008; Hamberg et al., 2011). This was the case of FAS 142 introduction (Zang, 2008) and transition goodwill impairment losses in Canadian context (Lapointe-Antunes et al., 2008). Higher levels of impairment may be due to management's desire for the immediate write-off of goodwill or its parts to avoid write-offs, which would likely occur in the future and could largely be attributed to their (poor) management performance.

Management's compensation is also supposed to have an impact on decision about goodwill impairment. If the management is remunerated on the basis of accounting numbers, impacted by the impairments of goodwill, it is not willing to recognise write-offs (Hamberg et al., 2011). It is argued that the highest proportion of cash compensation is accounting-based (Watts & Zimmerman, 1978), usually written on net income and thus including the effect of impairment losses. Beatty and Weber (2006) established that managers with earnings-based bonuses which included transitional impairment losses recorded lower goodwill impairment losses when adopting FAS 142. In the case of Ramanna and Watts (2011), 57% of the companies which did not record impairment loss had a variable remuneration in the form of cash bonus, while in the companies where impairment loss was recorded this was the case only in 39% of the companies. The test of association resulted as statistically significant.

2.2. Factors that facilitate discretion

Empirical studies of the factors that facilitate goodwill discretion are lacking. Ramanna and Watts (2007) were the first to explore the factors that might lead to opportunism of managers in this respect. From their point of view discretion can be aligned to (Ramanna & Watts, 2007, 2): (1) the number and size of CGUs; and (2) the proportion of unverifiable net assets.

Authors are not completely coherent regarding the impact of CGUs' number on discretion choices. Ramanna and Watts (2007) demonstrated that more CGUs lead to lower impairments of goodwill. Similarly, in their research based on the sample of American companies, Zhang and Zhang (2007), established that in the process of acquisition a larger proportion of purchase price surplus (over the fair value of net identifiable assets) was allocated to goodwill (and less to previously not recognised intangible assets) in the case

of companies with more segments (proxy for CGUs). The analysis suggests that companies believe that more discretion would be present in cases where more segments are formed. On the other hand, Lapointe-Antunes et al. (2008) believe that a higher number of CGUs make the redistribution of losses among CGUs more difficult. However, the results of their empirical analysis did not confirm their expectations. Companies with more CGUs recorded less goodwill impairment. Similarly, Ahmed and Guler (2007) state that more CGUs are connected with lower extent of discretion. In their empirical analysis, based on American publicly quoted companies, they established that goodwill of companies with more CGUs explains a higher extent of stock prices in comparison with goodwill allocated to less CGUs. *Ceteris paribus*, the more numerous CGUs are, the less discretion there is while allocating goodwill to CGUs. On the basis of present day studies, the relationship between the number of CGUs and subsequent discretion in impairment testing is still not clear.

The relation between (un)verifiable net assets and goodwill impairment was analysed by Zhang and Zhang (2007) and Ramanna and Watts (2011). Zhang and Zhang (2007) measured verifiable net assets as [cash + investments – debt – preferred equity] / [total assets - liabilities]. Zhang and Zhang (2007) established that companies allocated less purchase price surplus (over the fair value of net identifiable assets) to goodwill in cases when the share of unverifiable net assets was smaller. More goodwill was recognised in companies with larger proportions of unverifiable net assets. In the case of Ramanna and Watts (2011) higher unverifiable net assets were associated with lower impairments of goodwill.

3. Research framework

3.1. Research question and methodology

Since studies have shown that companies act opportunistically while applying the impairment test of goodwill (Segal, 2003; Beatty & Weber, 2006; Zang, 2008; Ramanna & Watts, 2011), we were interested in establishing if there is any opportunistic discretion while applying IAS 36 in the case of large Italian companies reporting under IFRS in the time of the current financial crisis.

In order to answer the research question we focused our analysis on Italian publicly traded companies reporting under IFRS. Italian companies were selected for the following reasons: Leuz et al. (2003) and Burgstahler et al. (2006) have shown that institutional factors have an important influence on the accounting reporting quality. In accordance with the study by Leuz et al. (2003), Italy falls within countries with a low level of investor protection. This variable is evidenced in the study by Leuz et al. (2003) as an important factor that influences the extent of earnings management in one country. Countries with a low level of investor protection are supposed to have a higher extent of earnings management.

Studies from the field of goodwill impairment testing are possible only on samples of countries where in the past sufficient mergers and acquisitions occurred. Unless a country has a high merger and acquisition activity and a developed stock exchange, this kind of study is not feasible since the sample of companies' is too small. Small samples were already a problem in the research by Beatty and Weber (2006) and Rammana and Watts (2011) made on samples of US companies. In the period 1990–2007 Italy was among the top five EU countries with the highest number of mergers and acquisitions (Erel, Liao & Weisbach, 2009). Among these countries Italy was the country with the lowest degree of

investor protection. Thus, from the perspective of earnings management, Italian business environment is particularly interesting.

The sample consists of companies with the market indicators of goodwill impairment need; i.e. those that have the book value of equity capital (B) higher than the market value (M); M/B ratio < 1 on the day of the balance sheet for each financial year (in accordance with the methodology of Beatty & Weber, 2006; Ramanna & Watts, 2011). In our sample we retained only companies with a difference between the book value and the market value of equity higher than the book value of goodwill (methodology of Beatty & Weber, 2006). Firstly, to enhance the power of tests, companies with the M/B ratio less than one for two consecutive years were selected (in accordance with the methodology of Ramanna & Watts, 2011), but the sample proved to be too small.

We focused on times of financial crisis, i.e. the period 2008–2010. The unfavourable effects of the financial crisis, with different time delays, also affected individual activities in the real sector, thus increasing the likelihood of the need for CGU and its related goodwill impairments.

We excluded financial institutions and companies with no goodwill on their balance sheet. The final sample resulted in 188 observations. The financial data were gathered from the database Datastream, Worldscope and hand collected from the annual reports[3].

According to the methodology of Ramanna and Watts (2011), firstly, the presence of positive private information hypothesis was tested. We examined whether non-impairment firms are more likely to show evidence of net share repurchase activity (repurchase of own shares) or net insider buying (directors' purchases of shares). For this purpose we used the test of association as explained in Section 4.

For the empirical testing of opportunistic discretion, the logistic regression analysis was used. In our case, the distribution of the dependent variable (impairment of goodwill) is asymmetric and takes value between 0% and 15% (measured as goodwill impairment for the year over previous year's assets). Only 26% of the companies in the sample recorded the impairment of goodwill (48 out of 188 companies). That is why multivariate linear regression analysis (used by Segal, 2003; Ramanna & Watts, 2011) or tobit analysis (Cowan et al., 2006; Beatty & Weber, 2006; Lapointe-Antunes et al., 2008; AbuGhazaleh et al., 2011) is not appropriate (Hopkins, 2011). Logistic regression was already used for the empirical testing of opportunistic discretionary choice in accounting for goodwill impairments by Guler (2006), Van de Poel et al. (2009), Verriest and Gaeremynck (2009).

Based on the review of existing research findings and the analysis of the rules in accounting standards, we formed a model for verifying opportunistic discretionary choice in the process of goodwill impairment testing through incentives and factors that may lead management to these practices. In addition to these variables, the model includes some variables that were not previously subject to such analysis. Given that the analysis is based on the data from times of financial crisis, the model includes variables that could be especially important in times of financial crisis. Independent variables such as impairment of financial assets, impairment of tangible assets (PP&E), and impairment of intangible assets were originally included in the model, with the aim of analysing their possible impact on recognising the opportunistic impairment of goodwill. The model used can be expressed as follows:

$$Imp_i = \text{Intercept} + \beta_0(\text{Incentives for opportunism})$$
$$+ \beta_1(\text{Reporting discretion}) + \beta_2(\text{Control variables}) + \varepsilon_i \qquad (1)$$

In the above equation Imp_i equals to 1 if a company recorded impairment of goodwill and to 0 if no impairment of goodwill was recorded (nominal variable). Independent variables are measured as follows.

Incentives for opportunism:

- changes of chief executive officers (Δ CEO); it is a nominal variable that equals one if there has been a change in chief executive officers in time t and t-1, and 0 otherwise (according to the methodology of Segal (2003) and Masters-Stout et al. (2008). The impairment loss of goodwill is more likely to occur when there is a change in key management.
- management's compensation (bonus); it is a nominal variable that equals one if the key management received a cash based bonus in the year t, and 0 otherwise. Previous empirical analysis has shown that cash compensation is usually based on accounting profit (Beatty & Weber 2006; Ramanna & Watts 2011). Managers with an accounting based compensation are expected to be unwilling to record an impairment loss.
- debt ratio (debt%); measured as the amount of debt(t) over total assets(t). In accordance with the methodology of Godfrey and Koh (2009), the value of goodwill was excluded from total assets. It is expected that firms with higher debt ratio are unfavourable to impairment of goodwill.
- big bath and smoothing variables are calculated according to Riedl (2004). Big bath and smoothing variables are based on earnings change between year t-1 to t, scaled by year t-1 assets. The big bath variable equals 1, if the negative change in earnings between years t and t-1, scaled by assets in year t-1, is less than the median value, and 0 otherwise. Firms with bigger negative changes are expected to have larger goodwill impairments (in our case we expect a higher likelihood of impairments). The smoothing variable is the mirror image of the bath variable. A large increase in earnings shall lead to a higher likelihood of goodwill impairment.
- impairments of other assets; we expect that firms with higher impairments of long-term assets (impairment of financials – Imp fin, impairment of intangibles – Imp int, impairment of property, plant and equipment – Imp PP&E; measured as separate independent variables) have an opportunistic incentive not to recognise impairments of goodwill. Impairments were measured at time t and scaled by the value of total assets from time t-1.

Goodwill reporting discretion:

- number of CGUs measured as the number of CGUs in time t,
- verifiable net assets (VNA); measured as [cash + investments – debt – preferred equity] / [total assets - liabilities]. Higher proportion of verifiable net assets is expected to allow less discretion and thus lead to higher probability of goodwill impairments.

Control variables:

- proportion of goodwill (*GW%*); measured as goodwill (t) over total assets (t),
- changes of ROA (Δ *ROA*); measured as changes of return on assets of the current financial year over the previous financial year,
- changes of sales (Δ *sales*); measured as changes of sales of the current financial year over the previous financial year, divided by the value of total assets (t-1),

Table 1. Frequencies and relative frequencies of nominal variables.

		Impairment of goodwill		
		No impairment	Impairment	Total
Number of companies per year		140	48	188
	2008	53	18	71
	2009	41	12	53
	2010	46	18	64
Number of companies per year (in %)	2008	38 %	38 %	38 %
	2009	29 %	25 %	28 %
	2010	33 %	37 %	34 %
ΔCEO	No	92%	58%	84%
	Yes	8%	42%	16%
Bonus	No	44%	72%	51%
	Yes	56%	28%	49%
Big bath	No	63%	75%	66%
	Yes	36%	25%	34%
Smoothing	No	61%	48%	57%
	Yes	39%	52%	43%

Source: Worldscope, Datastream, annual reports, own calculations.

- changes of net income (Δ *NI*); measured as changes of net income of the current financial year over the previous financial year, divided by the value of total assets (t-1),
- changes of cash flow from operations (Δ *CF oper*); measured as changes of cash from operations of the current financial year over the previous financial year, divided by the value of total assets (t-1),
- *total assets*; measured as the natural logarithm of total assets of the current financial year,
- market value to book value ratio (*MVBV*); calculated on the day of annual balance sheet,
- buy and hold return (*Buy & hold*); company's stock return from the beginning to the end of the financial year.

4. Data analysis and results

Frequencies and relative frequencies for nominal variables are presented in Table 1, while descriptive statistics of continuous variables are presented in Table 2. Goodwill impairment (over total assets) on average represents 0.31% of total assets. It seems that impairments of goodwill in times of financial crisis are unexpectedly low (despite the important role of goodwill in relation to total assets). The economic non-importance of goodwill impairments could be a consequence of economical non-importance of goodwill in the balance sheet of companies included in the sample. However, the data show that this is not the case. Goodwill represents on average 13.06% of total assets (Table 2).

Frequencies and relative frequencies of non-impairers and impairers shows that CEO changes occurred in 16% of the companies, while cash based bonus was paid in 49% of the cases. Interestingly, the share of debt is higher in the case of impairers (91%) in comparison with non-impairers (66%), most probably indicating normal (economically justified) impairments. On average, impairments of financial assets, intangibles and PP&E are small. Interestingly, the relative performance changes of impairers are slightly better (less worse)

Table 2. Descriptive statistics of numerical variables.

	Goodwill impairment																	
	No impairment						Impairment						Total					
	Average	Median	St. devia-tion	Min	Max	n	Average	Median	St. devia-tion	Min	Max	n	Average	Median	St. devia-tion	Min	Max	n
% imp GW	.000	.000	.000	0	0	140	1.228	0.325	2.968	0.003	14.877	48	0.313	0.000	1.582	0	14.87	188
% debt	66.395	63.456	19.691	7.82	126.28	140	91.083	67.194	58.453	31.08	302.60	48	72.698	56.1831	35.545	7.82	302.60	188
Imp fin (%)	.089	.000	.375	0	3.09	140	.126	.000	.358	0	1.50	48	.107	.000	.371	0	3.09	188
Imp int (%)	.970	.000	7.562	.00	73.88	140	.93	.00	0.256	.00	1.24	48	.746	.000	6.532	.00	73.88	188
Imp PP&E (%)	.269	.000	1.026	.00	10.76	140	.280	.007	.770	.00	5.10	48	.272	.000	.966	.00	10.76	188
CGU	4.25	4.00	2.481	1	12	140	6.06	5.00	4.060	1	19	48	4.72	4.00	3.057	1	19	188
% VNA	-112.044	-96.154	111.552	-676.57	41.29	140	-143.660	-140.178	124.283	-595.34	34.77	48	-120.033	-102.617	115.382	-676.57	41.29	188
% GW	10.021	5.663	11.771	0.013	56.940	140	21.927	17.159	20.201	0.3.828	73.069	48	13.061	8.426	15.253	0.013	73.069	188
Δ ROA	-1.258	-0.735	4.714	-16.950	16.810	140	-.619	-.805	2.910	-10.00	6.07	48	-1.115	-.766	4.321	-16.95	16.81	188
% Δ sales	-.400	-.147	25.538	-167.06	132.32	140	2.097	-.257	11.176	-16.52	44.35	48	.237	-.014	22.746	-167.06	132.32	188
% Δ net income	-1.425	-5.628	8.513	-83.61	2.49	140	-.553	-.605	2.992	-12.09	4.86	48	-1.221	-.582	7.501	-83.61	23.49	188
% Δ CF oper	-2.726	-.839	19.967	-228.02	14.16	140	-.349	-.417	4.906	-12.30	19.66	48	-2.119	-.762	17.421	-228.02	19.66	188
Total assets (ln)	5.731	5.526	.632	4.63	7.77	140	6.307	6.412	.840	5.02	8.21	48	5.878	5.593	.733	4.63	8.21	188
MTBV	0.652	0.650	0.191	0.210	0.970	140	0.631	0.665	0.191	0.290	0.950	48	0.646	0.655	0.191	0.210	0.970	188
Buy&hold return	-17.630	-22.392	44.631	-80.490	238.393	140	-22.019	-26.010	44.269	-83.187	106.48	48	-18.750	-23.361	44.462	-83.187	238.39	188

Source: Worldscope, Datastream, annual reports, own calculations.

than those of non-impairers (average value of Δ ROA, % Δ sales, % Δ net income and % Δ cash flow from operations).

4.1. Association of goodwill write-offs with positive private information proxies

Firstly, we analysed if there are any positive private information about the future cash flows of non-impairers that might explain the absence of impairment (information asymmetry). We performed the test of association, comparing the existence of positive private information between non-impairers and impairers (Table 3). Positive private information is measured with the presence of *net share repurchase activity* and *positive net insider buying*. Information asymmetry variable takes the value 1 when positive net share repurchase activity or positive net insider buying is present, and 0 otherwise.

The analysis reveals that no statistical difference is present while analysing the existence of positive private information between impairers and non-impairers. This was confirmed even in the separate analysis of both variables. On the basis of our results we cannot state that non-impairers have some private information (at least not on the basis of own share repurchase and positive net insider buying) which could explain the absence of goodwill impairment.

In continuation, the incentives that could stimulate opportunism and factors that facilitate discretion are analysed with logistic regression.

4.2. Results of logistic regression

Firstly, univariate logistic regression was used to investigate the relation between dependent variable and individual independent variables. The results in Table 4 indicate that the impairment of goodwill is ~ 8-times as likely in companies with a *change in CEO* in comparison with companies where there was no change in CEO. Goodwill impairment is also more likely to occur in companies where management did not receive cash based bonus in comparison with companies where cash based bonus was received. Statistically significant results were obtained also for the *share of debt* indicating that firms with higher debt ratio are more likely to record goodwill impairment (the results are not in line with previous studies). The results for the number of CGUs are also statistically significant. Companies with more CGUs have a higher likelihood for goodwill impairment.

In the group of control variables, two of them resulted as statistically significant – the proportion of goodwill and the value of total assets. Companies with a higher proportion of goodwill and higher value of total assets are more likely to record the impairment of goodwill.

Univariate logistic regression shows only the relation between a single independent variable and the presence of goodwill impairment, but it does not take into account the impact of other independent variables. In reality, the probability of goodwill impairment is

Table 3. Information asymmetry.

	InfoAsym = 0	InfoAsym = 1	Total	% with private info
No impairment	50	90	140	64.3%
Impairment	22	26	48	54.2%
Total	72	116	188	61.7%
Chi-square = 0.213 > p = 0.05				

Source: Annual reports, own calculations.

Table 4. Results of univariate logistic regression.

	B	Odds ratio	95% confidence interval		p
			Min	Max	
Incentives:					
Δ CEO	2.125	8.377	3.611	19.434	***.000
% debt	.023	1.023	1.009	1.038	***.001
Imp fin (%)	.461	1.585	.716	3.508	.256
Imp int (%)	.093	1.097	.952	1.264	.201
Imp PP&E (%)	.011	1.011	.724	1.412	.947
Bonus	-1.146	.318	.157	.644	***.001
Big bath	-.541	.582	.278	1.217	.150
Smoothing	.519	1.680	.868	3.250	.124
CGUs	.181	1.198	1.077	1.334	***.001
% VNA	-.002	.998	.995	1.001	.112
Control variables:					
% GW	.048	1.049	1.026	1.072	***.000
Δ ROA	.036	1.037	.960	1.119	.357
% Δ revenues	.005	1.005	.990	1.020	.528
% Δ net income	.022	1.022	.963	1.085	.478
% Δ CF operations	.027	1.027	.966	1.091	.391
Total assets (ln)	1.067	2.906	1.804	4.680	***.000
MTBV	-.560	.571	.103	3.167	.521
Buy&hold return	-.002	0.998	.990	1.005	.555
Year					795
Year (2009)	-.149	.862	.373	1.989	.727
Year (2010)	.141	1.152	.537	2.472	.716

Note: * the level of significance is lower than 0.1; ** the level of significance is lower than 0.05; *** the level of significance is lower than 0.01.
Source: Worldscope, Datastream, annual reports, own calculations.

impacted by several factors. We are aware that from the methodological aspect it would be more appropriate to perform the multivariate logistic regression including all variables but according to the fact that just 48 companies recorded an impairment of goodwill, we were constrained to reduce the number of independent variables (for more details see Peduzzi, Concato, Kemper, Holford & Feinstein, 1996). That is why we included in the multivariate model only those independent variables that were significant in the bivariate logistic regression analysis (6 variables).[4]

We analysed the presence of possible outliers. In our case we found eight outliers. They were excluded from the subsequent analysis. The problem of multicolinearity was not present. The results of the multivariate logistic regression are presented in Table 5.

The Wald test demonstrates that the likelihood of goodwill impairment is significantly affected by the following incentives:

Table 5. Results of multivariate logistic regression.

	B	St. error	Wald	Df	p	Odds ratio	95% confidential interval	
							Min	Max
Δ CEO	3.707	.766	23.391	1	.000	40.726	9.067	182.926
% debt	−.002	.012	.033	1	.856	.998	.974	1.022
Bonus	−1.425	.612	5.422	1	.020	.241	.073	.798
CGU	.113	.089	1.632	1	.201	1.120	.941	1.332
% GW	.076	.026	8.178	1	.004	1.079	1.024	1.136
Total assets (ln)	1.911	.473	16.298	1	.000	6.760	2.637	17.097
Constant	−14.902	3.089	23.277	1	.000	.000		

Source: Worldscope, Datastream, annual reports, own calculations.

- change of chief executive officers (Δ CEO) – there is a positive relation between Δ CEO and the probability of goodwill impairment. Goodwill impairment is ~ 40-times more likely to occur when there is a change in CEO in comparison with the situation when there is no change in CEO.
- cash based bonus – there is a negative relation between cash based bonus and the probability of goodwill impairment. Goodwill impairment is ~ 4-times (1/0,241) less likely to occur when management receives a cash based bonus in comparison with the situation when cash based bonus is not paid.

Moreover, in the group of economic indicators, a positive relation between the proportion of goodwill and the likelihood of goodwill impairment is statistically significant. Similarly, there is a positive relation between the value of total assets and the likelihood of goodwill impairment.

The results are in line with the previous findings of US studies and those studies of IFRS users which were focused on the first year of IFRS adoption[5]. The results confirm the findings of Beatty and Weber (2006) and Ramanna and Watts (2011) who established that management is not willing to record an impairment loss of goodwill when the cash based bonus is paid. Moreover, the results confirm the findings of Guler (2006), Zang (2008), Hamberg et al. (2011) who established that the change of chief executive officers affects the probability of goodwill impairment and the extent of goodwill impairment (Masters-Stout et al., 2008). These results indicate that the goodwill impairment rules, at a minimum, are applied differently between new and senior CEOs. New management is more likely to impair goodwill. There is no reason to believe that the arrival of new management would lead to deteriorated results of CGUs to which goodwill is allocated.

The authors are aware of the study limitations. The findings cannot be generalised to either all EU members or to other types of companies (financial, non-public). Since the analysis addresses only the period of financial crisis, the results cannot be generalised to other economic circumstances, since management in times of expansion may behave significantly different. Each variable derives from publicly available data and thus the authors were constrained to use proxies in cases where required data were not fully available.

5. Conclusion

Goodwill impairment test has become subject to increasing empirical research interest since the US FAS 142 was introduced. In accordance with the fact that many subjectivities are present when goodwill is tested for impairment, the presented empirical analysis focuses on its value reliability. Studies (Beatty & Weber, 2006; Zang, 2008; Lapointe-Antunes et al., 2008; Ramanna & Watts, 2011) have shown that management has incentives to act opportunistically when applying the impairment test of goodwill. However, these studies were made on samples of US and Canadian companies.

The results of our study made on the sample of Italian publicly traded non-financial companies confirm the findings of Beatty and Weber (2006) and Ramanna and Watts (2011) emphasising that the remuneration system affects the likelihood of goodwill impairment recognition. The results of the presented study confirm the findings of previous US and Canadian research (Guler, 2006; Zang, 2008; Lapointe-Antunes et al., 2008) which emphasises that newly appointed management is more likely to record goodwill impairment. Since the performance of impairers is slightly better in comparison with non-impairers, the

recognition of goodwill impairment in cases of CEO changes seems not to be a consequence of poor performance of past management.

In accordance with the fact that no indication of positive private information was evidenced in the case of non-impairers, and in spite of the fact that the sample included companies with market to book ratio less than one, and thus market indicated a need for impairment of goodwill, the results indicate that at least some opportunism is present.

The results of the presented empirical analysis contribute to science through offering knowledge in the area of incentives and factors that influence the choice of opportunistic discretionary goodwill impairment testing in the environment of large European non-financial companies with low investor protection. Accordingly, the study contributes to the literature in the field of accounting choice in the environment of large EU companies reporting under IFRS in times of financial crisis, an area which has not yet been investigated.

Opportunistic behaviour among management leads to higher agency cost and may affect the earnings quality. In this sense, the rules in the accounting standards are not well designed. Accordingly, it is worth considering how to limit opportunistic discretion.

Possibilities for further research in the field of goodwill's carrying amount reliability include the analysis of other EU countries to determine whether this evidence could be generalised to the EU level. Moreover, future studies shall explore if EU countries with different levels of investor protection are characterised by different results. Since goodwill has become an increasingly important asset for many companies also in the European context, it is crucial to understand its value reliability.

Notes

1. In the first year of FAS 142 introduction goodwill impairment losses were treated as below the line expenses, while in IFRS write-offs were charged to opening retained earnings.
2. Lai, Leoni & Stacchezzini (2010) made this kind of analysis on the sample of Italian insurance companies including data from 2005 to 2009. Since our sample does not include financial companies, results of their empirical analysis are not presented in details.
3. Data about the own shares repurchase, directors' purchases of shares, changes of management, management remuneration and number of CGUs were hand collected from the annual reports.
4. We were not able to reduce the number of variables to the required level with the use of statistical tools as factor analysis, the exclusion of highly correlated variables and the exclusion of variables with missing data.
5. The impairment losses in the period of adoption were treated differently from subsequent periods. In the case of IAS 36 implementation the retroactive method was in use. Adoption write-offs were charged to opening retained earnings (no effect on income). Afterwards, impairment losses became a part of expenses from continuing operation.

Disclosure statement

No potential conflict of interest was reported by the authors.

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