Goodwill Impairment as a Tool for Earnings Management

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Executive summary[2]
This research examines whether or not goodwill impairments are being used by Dutch listed firms to manipulate earnings. Two different regression models are used for this purpose which include firm-specific factors as well as proxies for big bath accounting, income smoothing and a factor for measuring the recognition of higher impairments around the time of a CEO change. The results show that the method (model) chosen to measure the impairment decision influences the generated results, and that overall no strong evidence is found which indicates that goodwill impairments are indeed being used to manipulate earnings.

For the full text of this master thesis refer to the following webpage:
http://hdl.handle.net/2105/5375.

1. Introduction

This research examines whether or not the impairment of goodwill is used to manipulate earnings at Dutch listed firms in the period 2005-2008. Since the introduction of the standards IFRS 3 and IAS 36, more professional judgement is needed for the valuation of goodwill in the financial statements, thereby bringing a higher level of subjectivity. This subjectivity provides opportunities for management to manipulate earnings, which can cause a distorting image in the financial statements which are provided to its users. When considering this subjectivity in the light of the current credit crisis, it becomes clear that this is a hot topic. The goal of this research is to investigate the significance of management's influence on the value of goodwill which is being accounted for when applying an impairment test. This leads to the following overall research question:

Are goodwill impairments being used by management as a tool for earnings management?

The remainder of this paper is structured as follows. First some important prior research on earnings management and goodwill is discussed (Section 2). Next, the hypotheses are presented as well as the models which are being applied in this research. Section 4 then presents the main results as well as the analysis. The paper concludes with a short

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[2] For a more elaborate discussion of earnings management and goodwill (impairment), as well as a more elaborate discussion of empirical evidence from prior literature and more detailed results of the empirical part of this research, a reference is made to the full text version of the master thesis.

summary and conclusion, the limitations of this research as well as some suggestions for future research on this topic in Section 5.

2. Prior literature

This section will discuss prior literature regarding earnings management, the implications of applying the impairment test for goodwill, as well as how the impairment test can be used as a tool for earnings management.

2.1 Earnings management

In the literature many different insights with regard to defining earnings management exist. A definition that is used often and will be used in this research is the definition from Schipper (1989, pp. 92): "*Disclosure management, in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gains (as opposed to, say, merely facilitating the neutral operation of the process*". This definition implies that management intervenes in the reporting process to reach some sort of personal gains. Also it does not classify earnings management as fraud. Therefore this definition captures the most import aspects of earnings management and fits this research in a good manner.

In practice, also different types of earnings management can be distinguished. The two most important types for this research are big bath accounting and income smoothing. Big bath accounting is an example of the use of earnings management to decrease the earnings of a firm. As many as possible, losses and write-offs are incurred in the same year. According to Mohanram (2003, pp. 2), big bath accounting is used by firms which cannot achieve their targets in a year. When these firms miss their targets, they engage in accounting methods to make the firm's results even worse. Two reasons for this can be identified. First it is very unlikely that the firm can reach the targets set for that year, implying the year is 'lost'. Secondly, the costs arising from missing the targets are incurred anyway. The costs the firm will incur from performing even worse will be minimal, since the biggest damage is done by missing the targets. The additional incurred losses can be used to increase or smooth income in future years.
Income smoothing on the other hand is used by management if they want to present a consecutive line of increasing earnings. To achieve this, earnings management that both increases and decreases income can be used. If the firm's income is higher than targeted, income can be decreased by using earnings management. As Mohanram (2003, pp. 3) points out, two purposes for this kind of accounting can be identified. The first is to 'save' some income for the future when the firm may not be able to meet its targets. The earnings from the previous period are used later. Earnings management can then be considered '*as an intertemporal transfer of income between periods*' (Mohanram, 2003, pp. 6). The second purpose of decreasing income, if income is higher than targeted, is to prevent expectations about the firm's performance to rise. If the expectations about future earnings increase, future targets will be more difficult to reach. Consequently, the consecutive line of increased earnings can be ended, as a result of one exceptionally good result.

2.2 The goodwill impairment test

The issuance of the new standard IFRS 3 requires that goodwill will be impaired annually based on fair value estimates of the acquired business. The impairment test replaces the annual depreciation of goodwill that was used previously.
According to IFRS 3, it is necessary to recognize an impairment loss when there is a decrease in value. An impairment loss is defined as '*the amount by which the carrying amount of an asset or a cash generating unit exceeds its recoverable amount*' (IAS 36.6).

An implication of applying the impairment test in practice is that a large amount of factors need to be determined for the impairment calculation, including the recoverable amount, the value in use, the carrying amount and the fair value. For instance regarding fair value, it is important that entities, who are estimating expected future cash flows, rely on reasonable and supportable assumptions and projections, according to Lander and Reinstein (2003, pp. 228). Also they should consider all available evidence to estimate these cash flows, since this forms the basis of the impairment test. The weight given to such evidence should be commensurate with how well the entity can verify this evidence objectively. Entities using ranges to estimate the amount or timing of possible cash flows should consider the likelihood of possible outcomes either directly, when applying an expected cash flow approach, or indirectly through the risk-adjusted discount rate, when determining the best estimate of future cash flows.
However, the factors used in an impairment test depend on a lot of assumptions made by management, since management is responsible for preparing the initial impairment calculation. The auditor only has the obligation to check this calculation. Some examples of assumptions that need to be made in the calculation include the discount factor (the weighted average cost of capital can be used for this), the amounts of future cash flows and the growth factor of the future cash flows. These assumptions give rise to a relatively high level of subjectivity in the impairment test. This level of subjectivity is supported by literature of Kuipers and Boissevain (2005). They argue that the most important opportunities to manage earnings are present in the area of cash flow projections. Therefore the underlying assumptions need to be challenged, amongst others internally and by the auditor, to test whether these assumptions are realistic. The existence of this higher level of subjectivity is also supported by Ball (2006) and Bini and Bella (2007). However, challenging the assumptions may be quite difficult to accomplish in practice. Johnson (2007) expresses concerns about auditors who may lack the necessary training in valuation methods for estimating fair values. This raises serious questions regarding the implementation of the fair value principle (and impairment) in practice.
Ball (2006) provides a possible reason for management to use impairments as a tool to manage earnings. Management fears to be punished by the market in the case of impairment shortly after an acquisition. The market may see this impairment as a sign of mismanagement, because the firm has likely overpaid for the acquired business. This reasoning is also supported by empirical evidence found by Li et al. (2005).

2.3 Managing goodwill impairments

This section will discuss the link between earnings management and the impairment of goodwill based on a summary of the most important prior research done on this subject. A

distinction is made between different kinds of research that give other insights into this subject.

Zucca and Campbell (1992) performed empirical research to test the link between earnings management and goodwill impairments. They assume that there is no pattern in the path of expected earnings, indicating that the path is 'random'. Zucca and Campbell (1992) found that the majority (45 out of 77) of the write-downs investigated were recorded when earnings were below expected earnings ("bathers"), while 22 out of 77 were recorded when earnings exceeded expectations ("income smoothers"). They interpreted these results as evidence that write-downs are used to manage earnings.
Van de Poel et al. (2008) recently studied a sample of listed companies in 15 EU countries preparing financial statements under IFRS in the period 2005-2006. They find, based on regression analysis, that the goodwill impairment decision for these companies is highly associated with financial reporting incentives. More specifically, their findings support that companies typically take their impairments when earnings are 'unexpectedly' high (smoothing) or when they are 'unexpectedly' low (big bath accounting). This evidence is therefore in accordance with the results of the research of Zucca and Campbell (1992).
Research was performed by Alciatore et al. (1998) on the finding that the discretion inherent in GAAP pertaining to asset impairments could be used by firms in their self-interest. An example they provide is that firms may use GAAP flexibility to avoid taking impairments due to concerns about potentially negative stock market reactions to such charges. Other firms could however record an impairment loss when earnings are particularly high in order to smooth income or, alternatively, they could take a bath by accelerating an impairment when earnings are already poor to maximize profits in future periods. Alciatore et al. (1998) argue that this flexibility suggests that the impairment decision could be strategically used by managers to adjust the timing and amounts of charges to income.
In addition, Jordan and Clark (2004) also found evidence which indicated that companies with unusually low earnings in a year reported a large impairment loss in order to lower the reported earnings even further, which is indicative of big bath accounting. Empirical evidence consistent with this behaviour is found by Francis et al. (1996). They show that managers use two different sorts of determinants in the asset impairment decision. On the one hand, managers take into account factors which reflect declines in the values of assets due to poor firm performance, increased competition and changes in the economic climate. On the other hand, asset impairment decisions may be influenced by personal reporting incentives, which means that management may take advantage of the discretion afforded by accounting rules to manipulate earnings by either not recognizing impairments when this is needed, or by recognizing impairments only when it is advantageous for management to do so. Francis et al. (1996, pp. 134) use a weighted tobit model to estimate the importance of impairments and earnings management variables in explaining both the existence and amount of a firm's write-off decisions. They find that for the full sample of write-offs, both manipulation and impairment are important determinants, but that incentives play a substantial role in explaining such items as goodwill write-offs.
Sevin and Schroeder (2005) also conducted research concerning goodwill impairments but focused more on the size of the firm as a factor that could influence the impairment. They

found that smaller firms were more negatively impacted by SFAS 142 and were therefore more likely to impair goodwill than larger firms. They therefore argued that goodwill seemed to be an account that lends itself to some level of manipulation and that the firm size and the level of earnings appear to be a factor in determining the impairment. Beatty and Weber (2006) examine several potentially important economic incentives that firms face when making impairment decisions. In using a regression model, which is consistent with previously discussed research by Van de Poel et al. (2008), they find evidence suggesting that firms' equity market concerns affect their preference for 'above-the-line' versus 'below-the-line' accounting treatment, and firms' debt contracting, bonus, turnover, and exchange delisting incentives affect their decisions to accelerate or delay expense recognition. However, Bens (2006) questioned the regression model used by Beatty and Weber (2006, pp. 296). He argued that accounting decisions can be quite complex, and such a simple linear framework (many dummy variables are incorporated in the model) may not capture many of the interesting subtleties involved. Moreover, many of the proxy variables used in the Beatty and Weber framework were difficult to interpret unambiguously. This criticism indicates that the regression model used by Beatty and Weber (2006), but herewith also the model used by Van de Poel et al. (2008), should be adjusted to capture more of the complexity of accounting (impairment) decisions. Henning et al. (2004, pp. 119) used a research method consistent with research discussed previously by Van de Poel et al. (2008) and Beatty and Weber (2006). Regarding the amount of goodwill write-offs, their results indicate that "*U.S. firm goodwill write-offs and U.K. firm goodwill revaluations exceed the amounts predicted by our models when we consider the initial value of goodwill. However, the actual write-offs and revaluations do not differ from amounts predicted by our models when we consider changes in the value of goodwill after the acquisition*". The authors find this interesting, since this kind of valuation behaviour is consistent with the big bath findings of Elliott and Shaw (1988). The results of Henning et al. (2004, pp. 114) may therefore reflect managerial incentives to maximize the goodwill impairment in transition, especially since the impairment was shown as a non-operating loss in the year of the adoption of SFAS 142, but as an operating expense in subsequent years. According to Henning et al. (2004, p. 119), it appears that "*U.S. firms delayed the income-reducing effects of goodwill write-offs, and U.K. firms timed the asset-increasing effects of goodwill revaluations to avoid additional agency costs*". These findings indicate that a certain amount of influence was used in determining the timing of the impairment decision, because a different timing of the impairment (and revaluation) could have had a major influence on the presented income in the financial statements.

Another direction of research supporting the link between earnings management and goodwill impairments was performed by Masters-Stout et al. (2007, pp. 2). In their research they incorporate the change in CEO as a variable which could influence the impairment decision. They hypothesize that CEOs tend to manipulate the impairment in the early years of their tenure since blame can be placed on earlier management's acquisition decisions and expensing goodwill early can improve future earnings. If new CEOs impair more goodwill than their senior counterparts, it would indicate that the impairment rules are not being applied consistently. In their research they also use a

regression model, as previously seen with Van de Poel et al. (2008), Beatty and Weber (2006) and Henning et al. (2004). The results of the analysis (Masters-Stout et al., 2007, pp. 13) provide compelling evidence that new CEOs impair more goodwill than their senior counterparts. Also a relationship exists between net income and the amount of impairment for all CEOs. These results therefore indicate that the new impairment rules, at a minimum, are applied differently between new and senior CEOs.
Strong and Meyer (1987, pp. 643) also performed research regarding CEO changes and goodwill impairments. They used multiple discriminant analysis to investigate the determinants of goodwill. In using this method, they determined that the change in senior management was a significant variable in explaining the tendency to report asset impairments. If the new executive came from outside the firm, this effect was even more significant.
The results of the research by Lapointe-Antunes et al. (2008)[3] provide additional evidence for the conclusion that impairments are reported in the case of a CEO change. They use a multivariate tobit model to assess the determinants of transitional goodwill impairment losses, which is in accordance with the method used by Francis et al. (1996) as discussed earlier. Overall, Lapointe-Antunes et al. (2008, pp. 43) find that the adoption of the impairment approach effectively triggered the recognition of large impairment losses for Canadian firms. An association is shown between the magnitude of transitional goodwill impairment losses and firms' incentives to both overstate and understate them. The results (Lapointe-Antunes et al., 2008, pp. 51) suggest that firms record higher transitional goodwill impairment losses to minimize the deviation from the industry median ROE (return on equity) and ROA (return on assets) as well as when they experience a change in CEO. The results are also consistent with firms recording lower transitional impairment losses to avoid further deviation from the industry median leverage, when there are sizable unrealized gains on exercisable stock options, when they subsequently issue new debt or equity capital, and when they are cross-listed in the United States. Finally, their findings seem to indicate that financially literate and independent audit committee members constrain managerial opportunism with respect to transitional goodwill impairment losses.

3. Hypothesis development, model development and sample selection

3.1 Hypothesis development

Based on the discussion of empirical evidence about the link between earnings management and goodwill impairments, it is possible to develop multiple hypotheses.

The first hypothesis can be linked back to the discussion of big bath accounting. When earnings are unexpectedly low and therefore the overall performance of the firm is below the desirable level, management will be more likely to choose for the recognition of an

[3] Noticeable for this research is that Lapointe-Antunes et al. (2008) divided the total sample into industry groups (energy, materials, industrial, consumer discretionary, consumer staples, health care, financials, information technology, telecommunications and utilities), according to TSX Indices, as given by Compustat.

impairment loss since the performance is already low. Therefore they 'take a bath' by recognizing a high goodwill impairment loss. This will provide management with the opportunity to increase or at least improve earnings in future years, since then the recognition of an impairment loss will probably not be necessary. This can also be linked to the bonus plan hypothesis which is also an important aspect of earnings management. Managers are unable to reach their bonus in a year of poor firm performance and therefore they take a bath to improve the chance of reaching the bonus in future years.

Based on the theory of big bath accounting, the following hypothesis is developed:

> ***H1: Firms are more likely to recognize a goodwill impairment loss when their earnings are 'unexpectedly' low, ceteris paribus.***

To test this hypothesis, a proxy for the use of big bath accounting will be incorporated in the model. In this research the variable $BATH_{it}$ (and $BATH2_{it}$) will be used for this purpose. This variable is used to determine whether the earnings (before taxes) of the firm are below the industry median. When this is the case, management has an incentive to engage in earnings management by taking a bath. How this variable is measured is discussed into more detail in Appendix I. It is expected that a positive relation will be found between this variable and the impairment decision, since low earnings indicate poor performance and therefore an impairment loss may need to be recognized. Based on the latter, it is expected that the hypothesis will hold when tested by the model which is developed for this research.

The reasoning for the development of the second hypothesis is based on earnings management in the form of income smoothing. Under the circumstances that earnings are 'unexpectedly' high and the performance of the firm does not influence the bonus level anymore, management will have an incentive to recognize a goodwill impairment loss. This choice can be based on the fact that earnings are so high that the ceiling of the manager's bonus has already been reached. In that case, it is more profitable for management to accelerate the impairment since accelerating goodwill impairments has a positive effect on the chance of reaching the bonus in future years. Also this choice can be based on the fact that management wants to present a consecutive line of increasing earnings. When impairments need to be accounted for, this could have a great influence on this consecutive line of earnings, depending of course on the absolute size of the impairment. Therefore management may have incentives to postpone the impairment loss and to pass the impairment on to the future in the case of poor performance. However, when looking at the case when earnings are unexpectedly high, these earnings can then be smoothed by recognizing an impairment loss that may not have been necessary yet to boost performance in the future. Therefore, this hypothesis can be seen from two different viewpoints. The first viewpoint is based on the bonus plan hypothesis, the second is based on the incentive to smooth earnings.
Based on the previously discussed theory the following hypothesis can be formulated.

> ***H2: Firms are more likely to recognize a goodwill impairment loss when their earnings are 'unexpectedly' high, ceteris paribus.***

As also discussed with the first hypothesis, for this hypothesis also a proxy needs to be determined which can measure whether income smoothing takes place. For this purpose the variable $SMOOTH_{it}$ (and $SMOOTH2_{it}$) will be incorporated in the model (see Appendix I for a more precise measurement of this variable). This variable is used to determine whether the firm's earnings deviate (substantially) upward from the industry median. When this is the case, an indication is found that management has an incentive to smooth earnings. It is expected that a positive relation will be found between this variable and the impairment decision, since the unexpected good performance of a firm provides the incentive to smooth earnings and therefore to report an impairment loss.
Based on the latter, it is expected that this hypothesis will hold when tested by the model.

Overall, Hypothesis 1 and 2 imply that it is expected that managers are encouraged to underreport earnings in the case of large earnings surprises. In that case, firms have incentives to report all impairments and even accelerate impairments to boost performance in the future (see also Van de Poel et al., 2008, pp. 15).

The effects of a change in CEO are also included in this research, since the discussed evidence in the previous section has shown that a change in CEO can result in big bath accounting. Important research discussed on this topic was done by Masters-Stout et al. (2007). They found compelling evidence that new CEOs impair more goodwill than their senior counterparts. Also Lapointe-Antunes et al. (2008) found higher transitional goodwill impairment losses when a firm experienced a CEO change. The reasoning behind this is that new CEOs will try to loose the inheritance of the previous CEO to make sure that the performance in the following years will improve. So the new CEO will try to pass the weak performance onto its predecessor. As discussed with the first hypothesis, the new CEO will therefore 'take a bath' to loose this entire inheritance immediately in the first year.
Based on the previously discussed theory it is therefore also hypothesized that:

> ***H3: Firms that experience a change in CEO record higher transitional goodwill impairment losses.***

To test this hypothesis, a proxy is incorporated in the model only now for measuring higher impairments around the time of a CEO change. The variable CEO_{it} will be used for this purpose which is based on a combination of the models of Masters-Stout et al. (2007, pp. 6) and Francis et al. (1996, pp. 122-124). The results of research done by Masters-Stout et al. (2007, pp. 11-12) and Francis et al. (1996, pp. 125) have proven that, as expected, this variable has a significant impact on the impairment decision. Since a change in CEO is often associated with big bath accounting, it is therefore expected that a positive relation will be found between this variable and the impairment decision.
Based on the theory and the outcomes of these studies, it is therefore expected that this relation between CEO changes and the recognition of goodwill impairment losses can be found in this empirical research, which implies that it is expected that Hypothesis 3 will hold when being tested by the model

3.2 Model development

In the brief literature review, multiple models have been mentioned that were used to perform empirical research on goodwill impairments and earnings management. The choice was made to use the model of Van de Poel et al. (2008) as the starting point for this research, and from thereon make adjustments to fit the model to the purposes of this research. The model of Van de Poel et al. (2008) is the most appropriate model to use as a starting point for this research since it incorporates many different factors, including reporting incentives and economic conditions of the firm. Also the variables are measured such that the magnitude of the figures is also taken into account in a large number of cases when investigating the impairment decision.
The following two adjusted models are developed for this research.[4]

Model 1

$$\begin{aligned} IMPAIRMENT_{it} = {} & \alpha_0 + \alpha_1 BATH_{it} + \alpha_2 SMOOTH_{it} + \alpha_3 CEO_{it} \\ & + \alpha_4 \Delta SALES_{it} + \alpha_5 \Delta OCF_{it} + \alpha_6 \Delta indROA_{it} \\ & + \alpha_7 GOODWILL_{it-1} + \alpha_8 SIZE_{it} + \alpha_9 INDUSTRY_{it} + \varepsilon_{it} \end{aligned}$$

Model 2

$$\begin{aligned} IMPAIR\_AMOUNT_{it} = {} & \alpha_0 + \alpha_1 BATH2_{it} + \alpha_2 SMOOTH2_{it} + \alpha_3 CEO_{it} \\ & + \alpha_4 \Delta SALES_{it} + \alpha_5 \Delta OCF_{it} + \alpha_6 \Delta indROA_{it} \\ & + \alpha_7 GOODWILL_{it-1} + \alpha_8 SIZE_{it} + \alpha_9 INDUSTRY_{it} + \varepsilon_{it} \end{aligned}$$

3.3 Sample selection

The focus of this research will be on all Dutch listed companies in the period 2005-2008. This implies that the total initial sample consists of 1.529 firm-year observations as gathered through the Thomson One Banker financial databases from Worldscope Fundamentals. Noticeable is that the year 2008 has also been included as far as is known at this very moment[5].

[4] The precise measurement of the variables is incorporated in Appendix I and will not be discussed here into further detail. For the reasoning behind the choice of these different variables as well as the choice for the method of measuring the variables, a reference is again made to the full text version of the thesis.

[5] Date of sample selection is March 17th 2009.

Table 1: Goodwill impairment losses by industry (excl. Financials)

Industry group		*Number of firm-year observations*			
		Total	*% of total*	*Impairment*	*% of total*
0001	Oil and Gas	17	4.63%	5	29.41%
1000	Basic materials	11	3.00%	5	45.45%
2000	Industrials	134	36.51%	29	21.64%
3000	Consumer goods	55	14.99%	12	21.82%
4000	Health care	23	6.27%	1	4.35%
5000	Consumer services	63	17.17%	13	20.63%
6700	Other	7	1.91%	3	42.86%
9000	Technology	57	15.53%	11	19.30%
	Total	*367*	*100.01%*[6]	*79*	*21.53%*

The initial sample is adapted to the research setting. This is done by excluding those observations which concern inactive firms, as well as observations for which not all data is available (especially for the year 2008). In addition, also those observations have been excluded in which no goodwill opening balance is present and simultaneously no impairment is recorded since these observations do not relate to goodwill and/or impairments and therefore do not have any additional value for this research. After this process of elimination the sample consists of 393 firm-year observations, split up into the different industries, as depicted in Table 1.
Important to notice is that financials have been excluded since such firms have to deal with very different laws and regulations than firms in other industries and may therefore cause a distortion in the results. The final sample therefore consists of 367 observations.

4. Results and analysis

This section will present the results of the performed empirical research, as well as an analysis of the results. In the first subsection, the results for the total sample are presented for both models. The second subsection briefly presents the results for the alternative tests.

Noticeable is that five different versions of the two models have been used in the regression analysis to determine whether any significant changes occur when a particular variable is excluded. Version I is the full model as depicted in section 3.2. The versions II, III and IV each exclude (one of) the variables that were incorporated to test the hypotheses. This is done to test whether these variables have additional explanatory power and whether excluding these variables can lead to changes in the results concerning the regression coefficients. The choice is made to exclude the variables in the following order. Version II first excludes the variable CEO_{it} since this variable is not one of the types of earnings management as distinguished by the theory. The next variable that is excluded for

[6] The total percentage differs from 100% as a consequence of rounding-off the percentages for each industry.

version III is $BATH_{it}$, since big bath accounting may be easier to detect than income smoothing and may therefore be used less often by management to avoid a loss of prestige. Therefore, version IV excludes the variable $SMOOTH_{it}$. Version V is the last version that is applied and is composed of the full model (version I), but includes also the interaction term between big bath accounting and a CEO change, since this is a factor which is added to the model instead of removed like was done for the previous versions, since it is expected that this will have additional explanatory power.

4.1 Regression results

This section presents the regression results for both models. Noticeable is that the focus here is on the most important variables in the model, which are used to test the hypotheses. The results for the remaining variables are only depicted in Table 2 and 3 and will not be discussed into further detail in this paper.

4.1.1 Regression results Model 1

For Model 1, the conclusion is drawn that the explanatory power of the model (Adjusted R-square) is not high, namely 0.093 at a maximum for version III of the model (1-III), indicating that this is the optimal version of the model. Noticeable is that Model 1-III is not the full model or the full model with as an additional variable the interaction term between big bath accounting and a CEO change. This implies that the models 1-I and 1-V have less explanatory power than the model that does not include the variable $BATH_{it}$ and the interaction term. This implies that these factors do not have additional explanatory power and can best be left out of the model. This result contradicts with expectations, since it was expected that the full model (including the interaction term) would have the highest explanatory power. In addition, the regression part of the Sum of Squares is particularly low, confirming the low explanatory power. The conclusion can therefore be drawn that Model 1 does not predict the impairment decision accurately and that a large residual is presented which cannot be explained by the regression.

Table 2 shows that the economic factor ΔOCF_{it}, the reporting incentive $SMOOTH_{it}$ and the control variable $SIZE_{it}$ are factors that have a significant influence on the impairment decision ($IMPAIRMENT_{it}$) for all versions of Model 1. For the model versions I, II and III the significance levels at which these factors prove to have a significant influence are also similar. However, the significance level that is applicable in the case of the economic factor ΔOCF_{it} for versions IV and V is somewhat different (1% and 10% respectively instead of 5%), but the factor still has a significant influence.

Table 2: Regression results Model 1 (total sample)

	Model I	*Model II*	*Model III*	*Model IV*	*Model V*
(Constant)	-0.246 (0.003)***	-0.245 (0.002)***	-0.236 (0.002)***	-0.175 (0.014)**	-0.247 (0.003)***
ΔindROAit	0.005 (0.395)	0.005 (0.395)	0.005 (0.379)	0.004 (0.473)	0.005 (0.397)
ΔSALESit	0.057 (0.328)	0.057 (0.324)	0.056 (0.330)	0.065 (0.261)	0.056 (0.333)
ΔOCFit	-0.440 (0.030)**	-0.443 (0.028)**	-0.476 (0.009)***	-0.314 (0.056)*	-0.439 (0.032)**
BATHit	0.027 (0.691)	0.027 (0.690)			0.025 (0.734)
SMOOTHit	0.108 (0.047)**	0.108 (0.044)**	0.106 (0.047)**		0.108 (0.047)**
CEOit	-0.008 (0.868)				0.007 (0.898)
GOODWILLit	0.066 (0.655)	0.067 (0.652)	0.067 (0.648)	0.054 (0.715)	0.066 (0.656)
SIZEit	0.065 (0.000)***	0.065 (0.000)***	0.064 (0.000)***	0.059 (0.000)***	0.065 (0.000)***
*BATHit*CEOit*					0.008 (0.951)

***, **, * = coefficient is significant at the α=0.01, 0.05, 0.10 level

When examining the effects of the variables of interest on the impairment decision into more detail, the conclusion can be drawn that the reporting incentive $SMOOTH_{it}$ has a positive significant influence on the impairment decision, which is consistent with expectations and prior research (Zucca and Campbell, 1992; Van de Poel et al., 2008). This indicates that high earnings and therefore high performance lead to a higher reported impairment loss, which is a proxy for the use of income smoothing. This implies that firms use impairments as a tool for earnings management in the form of income smoothing to present a consecutive line of increasing earnings. Therefore this provides evidence in support of Hypothesis 2 that firms are more likely to report a goodwill impairment loss when their earnings are 'unexpectedly' high.

One variable that does not prove to have a significant influence on the impairment decision is the reporting incentive $BATH_{it}$. This result contradicts with the results of Zucca and Campbell (1992) and Van de Poel et al. (2008), since they found evidence that this factor does have a significant effect on the impairment decision. Since this effect was supported by the theory concerning big bath accounting, it is remarkable that the results show no significant effect. Noticeable is that the model which has the highest explanatory power does not include this variable, indicating that it does not have additional explanatory power when incorporated in a model with the other variables. One possible reason why this variable has no significant effect is that management does not use the discretion provided by IFRS to report large impairment losses when performance is poor, based on economic considerations for the firm as a whole or with regard to private gains. It is possible that management is afraid it needs to step down when performance is even lower. Also it is possible that management can still earn a bonus at the current

performance level which would be lost when an impairment loss is reported. Many considerations can therefore lead to the same decision not to report an impairment. These results however indicate that big bath accounting is not used by management, which implies that no evidence is found in support of Hypothesis 1, stating that firms are more likely to recognize a goodwill impairment loss when their earnings are unexpectedly low. Therefore this hypothesis should be rejected based on this evidence.
Another variable that does not have a significant effect on the impairment decision is CEO_{it}. Again it is remarkable that no significant relation is found, since this result is inconsistent with expectations as well as with the results of the research performed by Masters-Stout et al. (2007), Lapointe-Antunes et al. (2008) and Strong and Meyer (1987) which indicated that a significant positive relation should have been found. Since the effect on the impairment decision is not significant, this variable does not prove that more or higher impairments are being reported around the time of a CEO change. This therefore implies that no evidence is found in support of Hypothesis 3, which should therefore be rejected. A possible reason why this effect does not prove to be significant is that also the variable associated with big bath accounting is not significant, indicating that less use is being made of this method. Another reason is that not in many cases when a CEO change has taken place, an impairment loss is being reported. Perhaps the performance of the company has not been such at the time of the change that an impairment loss could have been justified. Therefore the impairment could not have been passed onto the previous CEO since then suspicion would have been raised, which implies that it is in the best interest of the CEO not to report an impairment loss.

4.1.2 Regression results Model 2

For Model 2, the Adjusted R-square is at a maximum of 0.566 for version V of the model (2-V). The explanatory power of this model is therefore quite high. Noticeable is that this concerns the full model which incorporates all variables as well as the interaction term, indicating that together these variables can best predict the impairment decision. In addition, the regression for Model 2-V explains the largest part of the Sum of Squares, which leads to a smaller residual. This confirms that the explanatory power is quite high.

The estimates of the regression coefficients for Model 2 are depicted in Table 3. The results show that the economic factors $\Delta SALES_{it}$ and ΔOCF_{it}, the reporting incentives $BATH2_{it}$ and $SMOOTH2_{it}$, the control variable $GOODWILL_{it}$ and the interaction term $BATH2_{it}*CEO_{it}$ all have a significant influence on the impairment decision ($IMPAIR\_AMOUNT_{it}$) for all versions of the model, except the interaction term which is only incorporated in model version V. For all these variables the significance levels are also the same for all versions of the model, except for $\Delta SALES_{it}$ (5% level, with exception of version III where the 1% level is applicable).

Table 3: Regression results Model 2 (total sample)

	Model I	*Model II*	*Model III*	*Model IV*	*Model V*
(Constant)	-0.017 (0.007)***	-0.017 (0.009)***	-0.009 (0.216)	0.008 (0.222)	-0.010 (0.058)*
ΔindROAit	0.000 (0.259)	0.000 (0.268)	0.000 (0.632)	0.000 (0.562)	0.000 (0.580)
ΔSALESit	0.010 (0.019)**	0.011 (0.015)**	0.013 (0.009)***	0.011 (0.034)**	0.008 (0.040)**
ΔOCFit	0.176 (0.000)***	0.173 (0.000)***	-0.158 (0.000)***	-0.102 (0.000)***	0.190 (0.000)***
BATH2it	-0.421 (0.000)***	-0.422 (0.000)***			-0.245 (0.000)***
SMOOTH2it	-0.119 (0.002)***	-0.113 (0.003)***	0.148 (0.000)***		-0.142 (0.000)***
CEOit	0.005 (0.127)				-0.004 (0.164)
GOODWILLit	0.038 (0.001)***	0.038 (0.001)***	0.043 (0.001)***	0.048 (0.000)***	0.029 (0.002)***
SIZEit	0.001 (0.306)	0.001 (0.248)	0.000 (0.819)	-0.002 (0.071)*	0.001 (0.267)
*BATH2it*CEOit*					-0.325 (0.000)***

***, **, * = coefficient is significant at the α=0.01, 0.05, 0.10 level

When examining the variables of interest into more detail, the conclusion can be drawn that the variable $BATH2_{it}$ has a significant influence, however with a negative sign. This result contradicts expectations and prior research (Francis et al., 1996; Van de Poel et al., 2008), since it was expected that low earnings would lead to the recognition of an impairment loss. Evidence now is found indicating that firms experiencing 'unexpectedly' low earnings are more likely not to report an impairment loss. This effect can be caused by the relative magnitude of the change in earnings. Perhaps the level of earnings for a firm were not substantially low from the view of management, therefore leading to the delay of an impairment. The choice not to record an impairment loss can then possibly be based on the idea that the lower performance is only temporarily and therefore no impairment is necessary. This can therefore account for the different sign for this variable, since low performance in this case is not associated with goodwill impairments. Based on theory this can also be explained as a form of loss minimalisation. So this method is different than big bath accounting, since that method can also be associated with loss maximalisation. This result implies that no evidence is found supporting Hypothesis 1, stating that firms are more likely to report a goodwill impairment loss when their earnings are 'unexpectedly' low. Therefore this hypothesis needs to be rejected based on the different sign of the effect, even though the effect is significant.

The variable $SMOOTH2_{it}$ also has a negative significant influence on the impairment decision for the model versions I, II and V, but a positive sign for model version III. This positive sign is as expected, since a high performance and therefore high earnings can be smoothed by recognizing an impairment loss. This result is also consistent with the research of Francis et al. (1996). However, the negative sign for this variable when the other model versions are applied contradicts expectations. This can be explained by the

reasoning that earnings are not high enough to record an impairment loss. One possible reason for this can be that management cannot reach the maximum bonus when an impairment is recognized. Also it is possible that the recognition of an impairment can negatively affect the presentation of a consecutive line of increasing earnings. These results indicate that for model version III this variable is a proxy for the use of income smoothing, which implies that evidence is found that goodwill impairments are indeed being used as a tool for earnings management in the form of income smoothing. Therefore, for this model version, evidence is found that supports Hypothesis 2, indicating that firms are more likely to record a goodwill impairment loss when their earnings are 'unexpectedly' high. However, for the other model versions (I, II and V) the results indicate that the variable is not a proxy for income smoothing or profit minimalisation, but instead a proxy for profit maximalisation since no impairment loss is being recognized. This implies that for these model versions evidence is found which is not in support of Hypothesis 2. Therefore this hypothesis should be rejected.
For the interaction term $BATH2_{it}$*CEO_{it} the sign is negative, which contradicts with the individual expectations for these two variables since for both variables a positive relation was expected. This result also contradicts with the individual results in prior research (Francis et al., 1996 for $BATH2_{it}$; Masters-Stout et al., 2007 for CEO_{it}). taking into account that no prior research incorporated an interaction term for the combined effect of these factors. A possible explanation for the negative sign for this interaction term can be based on the result for the proxy for big bath accounting. The sign of the variable $BATH2_{it}$ is negative. When the sign for the variable CEO_{it} is positive, together these variables lead to a negative sign for the interaction term. In that case the sign for the variable CEO_{it} is as expected. Since the interaction term is significant and negative, a CEO change is not associated with big bath accounting but more with loss minimalisation. In other words, around the time of a CEO change, loss minimalisation is applied instead of big bath accounting and therefore the new CEO does not pass a weak performance onto his predecessor to loose the inheritance. Evidence is therefore found which contradicts with Hypothesis 3, indicating that firms which experience a change in CEO record higher goodwill impairment losses. Therefore this hypothesis should be rejected.

4.2 Results alternative tests

When comparing the results from the two models, it is a remarkable finding that the results differ significantly, since Van de Poel (2008) has stated that the use of a model with a dummy variable as the dependent variable (Model 1) to measure the impairment decision does not lead to different results compared to the use of goodwill impairment amounts (deflated by total assets) for measuring the dependent variable (Model 2). Since the results differ substantially after applying the two different models, alternative tests have been performed. Appendix II depicts the results of these tests for both models.

The main conclusions that can be drawn from these tests are as follows. For Model 1 (see Tabel 4, Appendix II), the results show that the variable $SMOOTH_{it}$ is the only significant variable for the observations from the year 2005, while for all other years none of the variables of interest have a significant influence on the impairment decision. This indicates that the results are heavily influenced by the observations from 2005, which is the

transition year to IFRS. Therefore it can be concluded that income smoothing has only been applied in 2005, meaning that Hypothesis 1 only holds for the observations from 2005 and should be rejected for all other years. The results for the total sample therefore do not sustain alternative tests. Based on these results, it seems that the introduction of IFRS has provided management the opportunity to manipulate earnings.

The results for Model 2 are depicted in Table 5 (Appendix II). The results show that for the years 2005 and 2008 none of the variables have a significant effect on the impairment decision. It seems that in 2005 management was awaiting further developments as a consequence of the introduction of IFRS and that the credit crisis has influenced management's behaviour in 2008. Observations from 2005 and 2008 therefore cause a distortion in the results for the total sample, since they weaken the effects of the different reporting incentives on the impairment decision.
For the observations from 2006 and 2007, the results differ substantially. For 2006 the variables $BATH2_{it}$ and $SMOOTH2_{it}$ have a significant effect for the model versions I, II and III, but not for version V. Since these reporting incentives do not have a significant effect on the impairment decision for version IV, this result contradicts with those for the total sample. However, for the other versions of Model 2, the sign of the variable $SMOOTH2_{it}$ is positive while it was negative for the total sample. This indicates that for the observations in 2006, higher impairments are being recognized in the case of unexpectedly high earnings. This implies that income smoothing is being used as a tool for earnings management, meaning that evidence is found in support of Hypothesis 2, while previously evidence for profit maximalisation was found. Noticeable is that the variable CEO_{it} proves to be significantly negative only for version V at the 5% level. This result contradicts the result for the total sample, since in that case a positive relation is found for version I instead of V. Therefore a CEO change in this case is associated with lower impairments. The interaction term is still negative and significant at the 1% level. Therefore the conclusions drawn based on the earlier results for this factor are robust.
For 2007, the reporting incentives $BATH2_{it}$ and $SMOOTH2_{it}$ and the interaction term have a significant effect when applying the model versions I, II and V, but not for version IV since in that case $SMOOTH2_{it}$ is not significant. The signs and significance levels for these variables are similar to those for the total sample. This can therefore lead to the conclusion that the conclusions drawn earlier based on these variables sustain after this alternative test. For the sample of 2007 also the variable CEO_{it} proves to have a significant positive effect at the 1% level for Model 2-I. This contradicts prior results for the total sample, since then this variable is not significant. This therefore indicates that in 2007 more CEO changes occurred simultaneously with the recognition of higher impairment losses. Therefore evidence is found that a firm which experiences a change in CEO recognizes higher impairments, which is in support of Hypothesis 3.

5. Summary and conclusion

In this research it has been investigated whether goodwill impairments are being used as a tool to manipulate earnings. Based on the presented results, the conclusion needs to be drawn that it depends on the model which is being applied whether this is the case, since

the results from the two models differ substantially. After alternative testing, the results differ from those for the total sample. For Model 1 earnings management is only found for the observations from 2005, so after the introduction of IFRS. For Model 2 (total sample), only indications are found that goodwill impairments are being used for profit maximalisation and loss minimalisation, instead of income smoothing and big bath accounting. Impairments are therefore used in a less extreme manner. After alternative testing, the only strong evidence however remains that in 2007 higher goodwill impairments have been recorded around the time of a CEO change. For all other observations, no (conclusive) evidence is found for earnings management. So overall, the results for the total sample are heavily influenced by the transition year to IFRS (2005) and the credit crisis (2008) and no strong evidence is found which indicates that management indeed uses goodwill impairments to manipulate earnings.
This research implies that goodwill impairments are highly subjective and therefore it is recommended to lower this subjectivity for instance by developing guidelines for management to perform the impairment test. More research should be performed on this subject to make it possible to include potential guidelines in the standards or to provide the standards with more detailed descriptions on how to perform the impairment test. This in turn could make it easier for auditors to check the impairment test and may therefore lower the subjectivity associated with it.

A limitation of this research is that no results have been generated for each industry separately. Since the subsamples for the different industries would have been too small in this research, the choice was made not to run the regression for each industry separately since it would make the results less reliable. This can however be a good example for future research. Also it is possible to look at financials or compare financials to the other firms, since financial firms have been excluded from this research because of their different laws and regulations with which they need to comply.
Also it is possible to investigate the effects of the introduction of IFRS on the level of earnings management in the Netherlands with regard to goodwill. This could be done by examining a certain period before and after the introduction (compare the use of amortization with impairments). Also the influence of the revised standard IFRS 3R can be investigated in a similar manner, since this new standard allows the use of the full goodwill method which can have an impact for the financial statements.

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Appendix I

Overview of the variables and their definitions

Dependent variables	
$IMPAIRMENT_{it}$	Indicator variable that takes the value of 1 if firm i takes a goodwill impairment in year t, and 0 otherwise.
$IMPAIRMENT\_AMOUNT_{it}$	The reported impairment amount deflated by total assets at the end of year t-1.
Economic factors	
$\Delta indROA_{it}$	The percentage change in firm i's industry return on assets (ROA) from year t-1 to year t, where industry is defined based on the Industrial Classification Benchmark Industry (ICB) from Worldscope.
$\Delta SALES_{it}$	The percentage change in firm i's sales from year t-1 to year t (= the change in firm i's sales from period t-1 to t, divided by total assets at the end of year t-1).
ΔOCF_{it}	The change in firm i's operating cash flows from period t-1 to t, divided by total assets at the end of t-1.
Reporting incentives	
$BATH_{it}$	Indicator variable equal to 1 if the change in firm i's pre-impaired earnings (before tax) from year t-1 to year t, divided by total assets at year t-1, is below the industry median of non-zero negative values, and 0 otherwise (= the proxy for the use of big bath accounting by management).
$SMOOTH_{it}$	Indicator variable equal to 1 if the change in firm i's pre-impaired earnings (before tax) from year t-1 to year t, divided by total assets at year t-1, is above the industry median of non-zero positive values, and 0 otherwise (= the proxy for the use of income smoothing by management).
$BATH2_{it}$	The value of unexpected earnings when unexpected earnings are below zero, and 0 otherwise. Unexpected earnings are measured as the operating earnings (earnings before taxes, so net income + income taxes) in year t less the operating earnings in year t-1, divided by total assets at the end of year t-1.
$SMOOTH2_{it}$	The value of unexpected earnings less the write-off when this resulting amount exceeds zero, and 0 otherwise. Unexpected earnings are measured as the operating earnings (earnings before taxes, so net income + income taxes) in year t less the operating earnings in year t-1, divided by total assets at the end of year t-1.
CEO_{it}	Indicator variable equal to 1 if the firm experienced a change in the CEO position in year t-1 or t, and 0 otherwise.
Control variables	
$GOODWILL_{it}$	The ratio of firm i's opening balance of goodwill on total assets at t-1.
$SIZE_{it}$	The natural logarithm of firm i's total assets in year t.
$INDUSTRY_{it}$	Indicator variable that takes the values of the ICB industry codes to divide the sample into multiple industry groups. The industry distribution is based on the ICB (Industrial Classification Benchmark Industry) division. There is a total of 9 industry groups.

Appendix II – Regression results alternative tests

Table 4: Summary regression results Model 1 – Regression coefficients

	BATHit	*SMOOTHit*	*CEOit*
Total sample, 2005-2008	0.027 (0.691)	0.108 (0.047)**	0.008 (0.668)
Total sample, 2005-2006	-0.056 (0.561)	0.156 (0.025)**	-0.003 (0.958)
Total sample, 2007-2008	0.090 (0.346)	0.033 (0.713)	0.035 (0.648)
Only first-time adopters IFRS, 2005-2008	0.004 (0.954)	0.107 (0.060)*	0.032 (0.535)
Only first-time adopters IFRS, 2005-2006	-0.073 (0.497)	0.146 (0.041)**	0.022 (0.726)
Only first-time adopters IFRS, 2007-2008	0.056 (0.586)	0.029 (0.769)	0.043 (0.634)
Only first-time adopters IFRS, 2005-2006-2007	-0.024 (0.769)	0.094 (0.112)	0.041 (0.452)
Only first-time adopters IFRS, 2005	-0.037 (0.808)	0.186 (0.075)*	-0.025 (0.783)
Only first-time adopters IFRS, 2006	-0.089 (0.548)	0.061 (0.569)	0.066 (0.488)
Only first-time adopters IFRS, 2007	0.008 (0.956)	-0.031 (0.778)	0.072 (0.505)
Only first-time adopters IFRS, 2008	-0.042 (0.842)	0.084 (0.728)	0.056 (0.779)

***, **, * = coefficient is significant at the α=0.01, 0.05, 0.10 level

Table 5: Summary regression results Model 2 – Regression coefficients

	BATH2it	*SMOOTH2it*	*CEOit*
Total sample, 2005-2008	-0.421 (0.000)***	-0.119 (0.002)***	0.005 (0.127)
Total sample, 2005-2006	-0.263 (0.000)***	0.062 (0.081)*	0.000 (0.998)
Total sample, 2007-2008	-0.705 (0.000)***	-0.385 (0.000)***	0.014 (0.023)**
Only first-time adopters IFRS, 2005-2008	-0.440 (0.000)***	-0.139 (0.001)***	0.009 (0.032)**
Only first-time adopters IFRS, 2005-2006	-0.264 (0.000)***	0.071 (0.079)*	0.001 (0.870)
Only first-time adopters IFRS, 2007-2008	-0.711 (0.000)***	-0.391 (0.000)***	0.024 (0.002)***
Only first-time adopters IFRS, 2005-2006-2007	-0.461 (0.000)***	-0.152 (0.001)***	0.009 (0.040)**
Only first-time adopters IFRS, 2005	-0.005 (0.670)	0.000 (0.943)	0.000 (0.442)
Only first-time adopters IFRS, 2006	-0.342 (0.000)***	0.140 (0.035)**	-0.007 (0.183)
Only first-time adopters IFRS, 2007	-0.860 (0.000)***	-0.482 (0.000)***	0.028 (0.004)***
Only first-time adopters IFRS, 2008	-0.065 (0.720)	0.187 (0.424)	0.008 (0.574)

***, **, * = coefficient is significant at the α=0.01, 0.05, 0.10 level