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# *Goodwill Impairment as a Tool for Earnings Management*

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# *Preface*

Before presenting this research, I want to express my gratitude to my thesis supervisor Ms. Wang for her insights regarding the investigation of goodwill impairments and earnings management. Also I want to thank Mr. Knoops who was the lecturer of the seminar Advanced Financial Accounting and who guided the development of this research for some time. In addition I also want to thank Mr. Van Ostende who assisted in the development of the theoretical part of this thesis within the scope of this seminar.

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## *Abstract*

This research examines whether or not goodwill impairments are being used to manipulate earnings. To test this, two regression models are developed that include firm-specific factors as well as proxies for big bath accounting, income smoothing and a factor for the recognition of higher impairments in the case of a CEO change. The two models differ in that the first model measures the impairment decision as a dummy variable, while the second model measures the impairment decision as the amount of the impairment deflated by total assets. These two models are used to determine whether the amount of the impairment is also influenced by the decision to report a goodwill impairment loss.

The results for both models differ substantially, indicating that the method chosen to measure the impairment decision influences the results. For Model 1, the main results show that the size of the firm and the change in operating cash flows have a significant influence on the impairment decision at the 1% (positive) and 5% (negative) level respectively. Also the proxy for income smoothing is significant at the 5% level, which implies that goodwill impairments are being used as a tool to smooth income. This therefore provides evidence in support of the hypothesis that firms are more likely to report a goodwill impairment loss when their earnings are unexpectedly high. In addition, the results do not provide evidence in support of Hypothesis 1 and 3, indicating that firms are not more likely to record a goodwill impairment loss when earnings are unexpectedly low or when there is a change in CEO. The results for Model 2 show that the change in operating cash flows, the change in sales, and the goodwill opening balance have a significant positive effect on the impairment decision at the 1%, 5% and 1% level respectively. The proxies for big bath accounting and income smoothing have a significant but negative effect at the 1% level, indicating that not big bath accounting and income smoothing are applied, but more strategies like profit maximalisation and loss minimalisation. Therefore these results do not indicate that firms are more likely to report a goodwill impairment loss when their earnings are unexpectedly high or low, which is not in support of Hypothesis 1 and 2. In addition, the results also do not provide evidence that higher impairments are being reported in the case of a CEO change, which indicates that Hypothesis 3 should be rejected. All together, the results generated when applying Model 2 therefore do not support the results of Model 1. No evidence is therefore found for both models simultaneously, indicating that earnings are being manipulated by reporting goodwill impairments. However, this research does provide evidence from the Netherlands that standard setters should be aware of the fact that goodwill impairments can in fact be used to manipulate earnings. Therefore it is recommended to lower the level of subjectivity by developing guidelines for performing the impairment calculation.

Overall, this research contributes to the existing literature regarding the impairment of goodwill and earnings management in that it focuses on Dutch listed firms, a new model is developed, the results show that the method chosen to measure the impairment decision influences the generated results, and that no strong evidence is found that goodwill impairments are being used to manipulate earnings.

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# *Chapter 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. The decision to report a goodwill impairment loss can be influenced by a number of factors. These factors include indicators for big bath accounting, income smoothing and changes in the CEO position. It is expected that the indicators for big bath accounting, income smoothing and a CEO change will all have a positive influence on the decision to recognize a goodwill impairment loss, since goodwill impairments could be used as a tool for earnings management as a consequence of the high level of subjectivity that is associated with the annual impairment test. On the one hand a poor performance can be exploited by taking a big bath to improve the performance in the future. On the other hand a better than expected performance can be smoothed to make sure that expectations for future years will not increase since then it would be more difficult to reach the higher set targets. Also a change in CEO is expected to have a positive influence on the decision to recognize an impairment loss since new CEOs have an incentive to impair more goodwill in the first year to loose the inheritance (poor performance) of the previous CEO.
Other factors that can influence the decision to record an impairment loss are the size of the firm (including total assets and the goodwill opening balance), as well as the economic conditions which a firm is confronted with like sales, operating cash flows and the return on assets.

During the period under investigation, the introduction of IFRS (International Financial Reporting Standards) has taken place, which has led to a change in the treatment of goodwill in the financial statements. The new standard, *IFRS 3 Business Combinations*, which has been active since 2004 requires an annual mandatory impairment test (IFRS 3.55), which is in conformity with the convergence trend between IFRS and US GAAP that has been the central point of attention for the past few years. IFRS 3 stipulates that the value of goodwill needs to be tested annually to determine whether any changes in value have occurred. In the meantime, the standard has been revised and this revised standard, *IFRS 3 (Revised) Business Combinations* [IFRS 3R], has been issued on January 10th 2008[1]. IFRS 3R resulted from the joint project between the US Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). One of the differences between the standards issued by these standard setters is that the FASB requires, rather than permits, the full-goodwill method. This indicates that an important change in IFRS 3R with respect to goodwill is that an option is added which permits an entity to recognise 100% of the goodwill of the acquired entity, instead of just the acquiring entity's portion of the goodwill. The increased amount of goodwill will then lead to an increase in non-controlling interest (minority interest) in the net assets of the acquired entity. The non-controlling interest is then reported as part of consolidated equity. Noticeable is that

[1] The effective date of the standard for business combinations is on or after July 1st 2009, however earlier application is permitted except for periods beginning before July 1st 2007.

IFRS 3 provides the full-goodwill option on a transaction-by-transaction basis, which means that with each new acquisition this option is available. Other differences between IFRSs and US GAAP are associated with the scope, definition of control, and how fair values, contingencies, and employee benefit obligations are measured, as well as several disclosure differences. These differences will not be discussed here into further detail, since this lies beyond the scope of this research.

Another standard relevant to this research is *IAS 36 Impairment of assets*. This standard contains the specific requirement that goodwill is subject to a mandatory annual test of impairment and should be impaired to fair value, if necessary. This means that the recognition of an impairment loss is based on management's judgement about the necessity of the recognition of this loss. So even though an annual impairment test is mandatory, the actual recognition of an impairment loss is still subject to management's discretion and is therefore highly subjective.

One reason why it is interesting to investigate the recognition of goodwill impairments is that the standards IFRS 3 and IAS 36 have led to the need for more professional judgement, therefore bringing a higher degree of subjectivity in the valuation of goodwill in the financial statements. This subjectivity provides opportunities for management to manipulate earnings, which can lead to a distorted image in the financial statements that are provided to its users. The group of users can include '*present and potential investors, lenders, suppliers, employees, customers, governments, the local community, parties performing a review or oversight function, and the media*' (Deegan and Unerman, 2006, pp. 32). These users make decisions based on the information that is provided in the financial statements. Therefore the information that is being provided should be reliable and should provide a true and fair view of the economic condition of the firm. Even though the users are assumed to have '*a reasonable knowledge of business and economic activities and accounting and a willingness to study the information with reasonable diligence'* (IASC, 1989, paragraph 25), it cannot be expected that these users have such distinct knowledge that they are able to discover whether management has used the opportunities provided to present a distorted image of the financial statements. This indicates that a conflict of interest arises. On the one hand, the need of the user is that the financial statements present a true and fair view of the economic conditions of the firm since the user's decisions will be based on the information provided, while on the other hand management wants to achieve benefits for the firm and/or for management. Based on this arising conflict of interest between the management of a firm and the users of the firm's financial statements, it is interesting to investigate the level of subjectivity that is associated with IFRS 3 and how this affects management's reporting behaviour. More specifically, to investigate the significance of management's influence on the value of goodwill that is being accounted for when applying the impairment test.

A second reason why it is interesting to investigate management's influence on goodwill impairments is based on recent developments concerning the credit crisis. An example of an announcement concerning goodwill impairments is provided in two recent articles about TomTom nv in *Het financieele dagblad* of January 20th 2009[2], which makes the effects of the credit crisis more clear. TomTom made an announcement that it recognized an impairment loss of over €1.9 billon on Tele Atlas. The macro-economic conditions were given as a reason why it was made impossible for TomTom to maintain the value of Tele Atlas as at the time of the acquisition. When this impairment loss is seen in relation to the €1.5 billion loan for the acquisition of Tele Atlas, it is therefore possible to conclude that this impairment loss can be classified as extremely large. The recognition of this large impairment therefore provides an indication that a big bath is taken. TomTom is only one of the many firms that have recently announced to recognize a large impairment loss. Since the magnitude of a goodwill impairment loss can be of great influence on both accounting earnings and the book value of assets that are being reported in the financial statements, the investigation of goodwill impairments is a hot topic at the moment. This great influence is also supported by research of Alciatore et al. (1998). They found that the mean amount of the impairments in the studies reviewed ranged from 4% to 19.4% of assets, with a maximum impairment representing 90% of assets. Therefore the economic significance of impairments motivates a careful analysis of firms' impairment behaviour.

When viewing these recent developments concerning the credit crisis in relation to the subjectivity that is associated with the previously discussed standard (IFRS 3) and herewith the opportunities for management to influence the value of goodwill that is being accounted for when applying an impairment test, it is clear that this is a very interesting and important topic to perform research on. Taking all the previous in consideration, the goal of this research is therefore to investigate the significance of management's influence on the value of goodwill that 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?***

Since the subject of interest is the influence of management on the impairment of goodwill, existing research will be used to develop a model to measure this. Important research in this area is recently performed by Van de Poel et al. (2008, pp. 4). They found evidence that the goodwill impairment decision 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). Because the focus of the research by Van de Poel et al. (2008) is on 15 EU countries reporting under IFRS, it is interesting to narrow the focus in

[2] Luttikhedde, H. (2009), 'TomTom geeft winstwaarschuwing na tegenvallende verkopen KW4', *Het financieele dagblad*
Luttikhedde, H. (2009), '2e Update: TomTom in de plus ondanks winstwaarschuwing', *Het financieele dagblad*

order to draw conclusions on country level concerning goodwill impairments as a tool for earnings management. The sample will therefore include all Dutch listed companies, included in different industries in the Netherlands.

Since the sample will be quite different than the one used by Van de Poel et al. (2008), and, as far as known, no other research has been done on this topic for the Netherlands in particular, this research contributes to the existing literature. This research also contributes to the existing literature in that a model is developed that includes different variables when compared to the model of Van de Poel et al. (2008, pp. 21). Also the consideration whether variables are incorporated in the model, is based on the results of studies published by amongst others Zucca and Campbell (1992), Francis et al. (1996) and Masters-Stout et al. (2007) concerning the investigation of goodwill impairments. Therefore the development of the model also provides a contribution to the literature. This will be discussed into further detail later on.

Overall, prior research has shown that the impairment of goodwill is used for big bath accounting and income smoothing. Stock market concerns, debt contracting, bonuses and CEO changes have proven to provide the most important incentives for this. Also evidence has been found of overpayment at the time of the acquisition as well as indications for influencing the timing of reporting an impairment loss. And since delaying or accelerating the recognition can be associated with either big bath accounting or income smoothing, this can be regarded as firms being engaged in earnings management.

In this research two slightly different models have been used to investigate whether the impairment of goodwill is being used to manipulate earnings. The first model uses a dummy variable as the dependent variable. This implies that also the proxies for big bath accounting and income smoothing should be measured as dummy variables. The second model measures the dependent variable as the amount of the impairment deflated by total assets. This implies that the proxies for big bath accounting and income smoothing should not be measured as dummy variables. Instead, these proxies are measured using the change in earnings and industry medians to determine whether the earnings for a particular observation are ‘unexpectedly’ high in the case that income smoothing is being investigated, or low in the case of big bath accounting. All other factors that have been included in the models are similar.
The results of this research are based on multiple regression analysis. A t-test was used to determine whether the coefficients have a significant influence on the impairment decision.

The results show substantially different outcomes when both models are applied, indicating that the method chosen to measure the impairment decision influences the results which are being generated by the regression analysis. For Model 1, the results show that goodwill impairments are indeed being used as a tool for earnings management, but only in the form of income smoothing. However, alternative tests show that this conclusion is not robust, since the observations from the year 2005 (the mandatory transition year to IFRS), influence the results for the total sample significantly. The results for Model 2 show that the effects of the proxies for big bath accounting and income smoothing are negative and significant, indicating that the sign is opposite as was expected. This implies that not big bath accounting and income smoothing are applied, but more strategies like profit maximalisation and loss minimalisation, which can be seen as less extreme measures. The implication of these results is that no strong evidence for both models simultaneously is found for the use of goodwill impairments as a tool for earnings management. Therefore no strong conclusion based on the presented evidence can be drawn that earnings are indeed managed by recognizing goodwill impairments.

The remainder of this paper is organized as follows. In the next chapter, earnings management will be defined and the focus will be on different conditions, incentives and forms of earnings management. In Chapter 3 the definition of goodwill will be discussed, as well as the application of the impairment test. Also implications of the impairment test will be discussed based on a short summary of insights from prior research examining this subject. Chapter 4 then discusses the link between managing earnings and the impairment of goodwill based on evidence found in prior empirical research. In the fifth chapter the hypothesis development and research design will be discussed. Chapter 6 provides descriptive statistics and correlations, while Chapter 7 further discusses the results of the research performed based on the explanatory power of the models and the regression coefficients, as well as a comparison of the results for the two models. Also alternative tests are included to determine the robustness of the main results. The research is completed by providing a summary and conclusion in Chapter 8.

# *Chapter 2: Earnings management*

## 2.1 Introduction

In this chapter the topic of earnings management will be addressed. In the second section earnings management will be defined and the distinction between earnings management and fraud is explained. The third section discusses the conditions necessary for earnings management. In the fourth section incentives of earnings management are given, and forms of earnings management are discussed in the fifth section. The chapter ends with a short summary and conclusion.

## 2.2 Definition earnings management

In the literature many different insights with regard to defining earnings management exist. One definition of earnings management that is used often is given by Healey and Wahlen (1999, pp. 368): "*Earnings management occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers*". This definition implies that managers use the discretion provided to them to mislead the users of financial statements to reach a desirable outcome. Another definition given by Schipper (1989, pp. 92), which is also used often, defines earnings management as: "*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 personal gains. As with the previous definition, a desirable outcome only here for management itself is therefore the main reason why earnings management is applied. According to Mohanram (2003, pp. 1) another way of defining earnings management is: "*The intentional misstatement of earnings leading to bottom line numbers that would have been different in the absence of any manipulation. When managers make decisions not for strategic reasons, but solely to change earnings, one can consider that to be earnings management*". Even though this definition does not implicitly mention gains for the firm or management, it can be interpreted in a similar way as the previous definitions. All together these definitions therefore imply that private gains for the firm and/or for its management form the main reason why firms engage in earnings management by using the discretion that is provided to them, meaning that they act within the boundaries as set by laws and regulations.

The above mentioned definitions are just a few examples of the many different existing definitions. Ronen and Yaari (2008, pp. 25) however made a distinction between three different areas to which these definitions can be assigned and they also provide three general definitions that capture the overall meaning of many different definitions in these areas. This classification can be captured as follows.

The 'White' area is defined by Ronen and Yaari (2008) as making use of the flexibility which is provided in laws and regulations to choose the accounting method that best reflects the private information management possesses about future cash flows. This means that management can obtain advantages by properly using the possibility to choose the accounting method. The 'Grey' area of earnings management is defined as making use of the flexibility which is provided in laws and regulations to choose the accounting method that is the best method as seen from the opportunistic perspective in that it maximizes only management's utility, or choosing the accounting method that is the best method as seen from the efficiency perspective in that it maximizes the utility for the entire firm. The 'Black' area is defined by Ronen and Yaari (2008) as misrepresenting or reducing the transparency of the financial statements by management through the use of tricks.

Ronen and Yaari (2008) classify beneficial (white) earnings management as that it enhances the transparency of reports. The pernicious (black) area involves outright misrepresentations and fraud. The grey area is manipulation of reports within the boundaries of compliance with bright-line standards which could be either opportunistic or efficiency enhancing. Noticeable is that Ronen and Yaari (2008, pp. 25) have decided to include the definitions of Healy and Wahlen (1999) and Schipper (1989) in the third area 'Black'. Even though the line between earnings management and fraud in this area is quite thin, this approach does not seem to be in accordance with the intentions of the definitions from Healy and Wahlen (1999) and Schipper (1989). Although the preceding definitions might suggest that using earnings management is actually fraud and a breach of law, in fact it is not. These definitions refer more to earnings management as management's use of the discretion they have in presenting financial results. Therefore this classification of Ronen and Yaari (2008) seems questionable.

Dechow and Skinner (2000, pp. 238-239) provide a classification of accounting methods, from which management can choose the method that is most desirable to apply. The choice for using one of these methods can also be accounted for as being engaged in earnings management, since each method has a different effect on the presented figures. Dechow and Skinner (2000) divided these managerial choices regarding accounting into the following four groups:

- *Conservative accounting*: this includes accounting choices regarding an overly aggressive recognition of reserves or provisions, overvaluing the in purchase acquisitions acquired in-process research and development and the overstating of charges for restructuring and write-offs on assets.
- *Neutral earnings*: these earnings are the result of a neutral operation of the process.
- *Aggressive accounting*: this includes accounting choices regarding the understating of the bad debt provision and overly aggressive drawing down the provisions and reserves.
- *Fraudulent accounting*: this includes accounting choices regarding the recording of sales before they are realizable or when they are fictitious, sales invoices that are being backdated and overstating inventory by recording inventories that are fictitious.

The first three groups of managerial choices distinguished by Dechow and Skinner (2000) are accounting choices which are legal within Generally Accepted Accounting Principles (GAAP). Although these groups may contain accounting methods that can be described as aggressive, the methods are acceptable. They are a mere form in which management can exercise their accounting discretion. These groups may therefore entail earnings management. The fourth group of managerial choices includes violations of GAAP. The accounting methods used in this group cannot be labelled as management discretion anymore, they are seen as fraud. Although the distinction made by Dechow and Skinner (2000) between the four groups may imply otherwise, in practice it is difficult to distinguish earnings management from 'normal' accounting decisions since the line between earnings management and fraud is quite thin.

Based on the previous discussion of definitions for earnings management, in this research the definition will be used as given by Schipper (1989). Not only is it a very widely used definition, it also captures the most important aspects of earnings management for this research in a good manner, since it does not classify earnings management as fraud. As will be discussed in more detail in section four of this chapter, a main incentive for earnings management is to reach some private gains, whether this is for management only (opportunistic perspective) or for the firm as a whole (efficiency perspective), and this is best captured by Schipper (1989). Therefore the focus will be on the 'Grey' area as classified by Ronen and Yaari (2008), since it is assumed that management uses discretion within the boundaries of law and regulations, which is in accordance with 'aggressive accounting' as described by Dechow and Skinner (2000).

### 2.3 Conditions for earnings management

The basis for earnings management is built on several conditions, namely accrual accounting and imperfect markets. The principle goal of accrual accounting is described by Dechow and Skinner (2000, pp. 237) as: "*to help investors assess the entity's economic performance during a period through the use of basic accounting principles such as revenue recognition and matching*". The purpose of accrual accounting is to enclose, in the financial results, the economic consequences of actions undertaken by the firm in a certain period, which lead or have led to cash-flow effects in other periods. Accruals are therefore the difference between a firm's financial result and its cash flows.

There are two different kinds of accruals (Schipper 1989, pp. 98-99), discretionary accruals and non-discretionary accruals. There is a distinction between the two types of accruals, based on the fact that not all accruals can be influenced by management. Management has to oblige to laws and regulations, and they are controlled by for instance regulators and auditors. The accruals that cannot be influenced by management are non-discretionary accruals. Discretionary accruals on the other hand are susceptible to management.

Although discretionary accruals can be used by management to perform earnings management, this is not necessarily the case. As Healey and Wahlen (1999, pp. 366) point out: "*If financial reports are to convey managers' information on their firm's performance, standards must permit managers to exercise judgement in financial reporting. Managers can then use their knowledge about the business and its opportunities to select reporting methods, estimates, and disclosures that match the firms' business economics, potentially increasing the value of accounting as a form of communication…*". This implies that managers can use discretionary accruals to reflect the firm's true economic performance in the financial statements. However, Healey and Wahlen (1999, pp. 366) also point out that the discretionary accruals can be used for earnings management. Auditing is imperfect and therefore opportunities for applying earnings management are created because of the use of judgement by management. This makes it possible that management can choose those particular accounting or reporting methods and present such estimates that do not reflect the underlying economics of the firm accurate.

As Stolowy and Breton (2004, pp. 9) point out, the second condition for earnings management is the existence of imperfect markets. If markets are perfect, information will circulate very fast and the information will be interpreted in the correct way by its recipients. People would know that management had managed the earnings and would correct the provided information for that knowledge. Under these conditions earnings management would bear no effect, except when, according to Stolowy and Breton (2004), only the timing of transactions could escape the attention of market participants. In an imperfect market earnings management can however bear effect, since the previously mentioned conditions of a perfect market are not met.

### 2.4 Incentives for earnings management

Several incentives for earnings management have been explained in the existing literature. Healy and Wahlen (1999) distinguish between three different incentives: capital market incentives, contracting incentives and regulatory incentives. Capital market incentives are related to the widespread use of accounting information by financial analysts and investors to assist them in valuing stocks. This can create the incentive for management to use earnings management in an attempt to influence the short-term stock price performance. (Healy and Wahlen, 1999, pp. 370) As Healy and Wahlen (1999) also point out, studies for capital market reasons showed that earnings are managed to meet the expectations of financial analysts as well as the expectations (budgets) as set by management itself. This indicates that earnings are managed in order to reach particular 'benchmarks' as were set internally as well as externally. When these benchmarks are not reached, management needs to deal with the consequences.

Evidence for capital market incentives is provided by more recent research of Mohanram (2003, pp. 2) and Dechow and Skinner (2000, pp. 242). They relate earnings management to capital market incentives (Xiong 2006, pp. 315). Earnings management is therefore related to the performance of the firm

regarding certain benchmarks. These benchmarks can vary from previous firm results to the forecasts made by analysts. Missing such a benchmark can be very costly for a firm, since markets react very strong on this issue. However, these incentives can be related to the Positive Accounting Theory as well. This theory "*is concerned with explaining accounting practice. It is designed to explain and predict which firms will and which firms will not use a particular method (...) but it says nothing as to which method a firm should use*". In the case of earnings management, the Positive Accounting Theory can be used to explain why managers make certain accounting choices instead of others. The actions of managers to meet benchmarks can all be derived back to the hypotheses distinguished by this theory (bonus plan hypothesis, debt hypothesis and political cost hypothesis[3]). Missing benchmarks can have many possible consequences for a firm and its management. First the bonus of a manager can be affected. When a certain level of profit is not achieved, the manager may not receive a bonus at all or his bonus is reduced (bonus plan hypothesis). Secondly missing a benchmark could lead to more expensive debt and credit conditions, because banks or suppliers evaluate the firm as less financially stable or creditworthy (debt hypothesis). Finally, exceeding a benchmark by far could lead to unwanted attention from political groups, since the firm is performing much better than expected (political cost hypothesis).

Contracting incentives are the second class of incentives as distinguished by Healy and Wahlen (1999, pp. 375). According to them, these incentives are based on the fact that accounting data are used to help monitor and regulate the contracts between the firm and its many stakeholders. To align the incentives of management and the stakeholders, implicit and explicit management compensation contracts are used. In order to limit management's actions that provide benefits to the company's stockholders at the cost of its creditors, lending contracts need to be closed. To determine the incentive for earnings management, Healy and Wahlen (1999) refer to Watts and Zimmerman (1978) who suggested that the existence of these contracts in fact creates incentives for earnings management, since it is likely to be too costly for compensation committees and creditors to 'undo' earnings management. The existence of these contracting incentives can therefore be exploited for increasing bonuses, improving job security and mitigating the potential violation of debt covenants.
The contracting incentives can be linked to the Positive Accounting Theory as developed by Watts and Zimmerman (1986, pp. 7). However, first the Agency Theory should be included. The relationship between the management of an organization and the stakeholders of that organization, for instance stockholders, is an agency relationship. The managers are the agents and the stockholders are the principals. In the Agency Theory, the assumption is made that all agents act in their own interest. Therefore, there exists a certain amount of tension between agents and principals. The agent's only purpose is to maximize his own wealth, even at the cost of the principal. A way to align the goals of the agents

[3] A detailed discussion of these hypotheses is included with the contracting and regulatory incentives in this section.

and principals can be to close contracts. However, despite the contract, the agent will still act to maximize his own wealth within the boundaries of the contract, for example by making accounting choices. With the Agency Theory as a basis, Watts and Zimmerman (1986, pp. 7) use the Positive Accounting Theory to distinguish between three hypotheses for managers or firms to adopt specific accounting methods. Under the contracting incentives two of these three hypotheses can be classified, namely the bonus plan hypothesis and the debt hypothesis. The *bonus plan hypothesis* implies that if management is granted bonus plans based on for example profits of the organization, they will adopt accounting methods that increase earnings. In this way they will maximize their bonus and consequently their own wealth. The second hypothesis, the *debt hypothesis*, implies that firms with low or bad solvability will adopt accounting methods that increase earnings. By adopting these methods they try to avoid violating loaning agreements, since this can be very expensive. The reasoning for this by Watts and Zimmerman (1990) is as follows (Deegan and Unerman, 2006, pp. 219). The higher the debt/equity ratio, the closer the firm is to constraints in the debt covenants. The tighter the covenant constraint, the greater the probability of a covenant violation and of incurring costs from technical default. Managers exercising discretion by choosing income increasing accounting methods relax debt constraints and reduce the costs of technical default.

The third and final class of incentives for earnings management are the regulatory incentives. For these incentives Healy and Wahlen (1999, pp. 377) refer to both industry-specific regulation and anti-trust regulation. As they point out concerning industry-specific regulation, practically all industries are being regulated to some extent, but for a limited amount of industries the regulatory monitoring is explicitly tied to accounting data (for instance the banking and utilities industries). These regulations create the incentive to use earnings management for the balance sheet as well as the income statement to make sure that no constraints that have been set are violated. Concerning anti-trust regulation but also other regulations, the same reasoning can be applied. Earnings are more likely to be managed when certain constraints are nearly violated, only now the focus is more on the risk of an anti-trust investigation or other adverse political consequences.
Under the regulatory incentives the third hypothesis of the Positive Accounting Theory as developed by Watts and Zimmerman (1986) can be classified, the political cost hypothesis. The *political cost hypothesis* implies that managers of large firms rather than small firms are more likely to adopt accounting methods that decrease earnings if the firm attracts more political attention. Size is therefore a proxy for political attention, since high earnings might attract unwanted attention and this may lower future profits (Healy and Wahlen, 1990, pp, 139).

## 2.5 Forms of earnings management

As described in the previous section, earnings management can be used both to increase and to decrease earnings. Therefore it is possible to distinguish between multiple forms of earnings management. Mohanram (2003, pp. 5-6) for example distinguishes the use of discretion that is provided by accounting standards regarding changes that can be made in the assumptions. An example of this can be that changes are made in the depreciable life of an asset periodically, which is justified by management based on the reasoning that the change brings the firm's policy more in line with industry standards. This can therefore be classified as manipulation of a particular account. A second form of earnings management Mohanram (2003) describes is the charging of large one-time amounts for reducing income. Also income can be managed through transaction manipulation, for instance by accelerating a revenue recognition shortly before the fiscal year-end. Also the managing of accruals is mentioned, which are the differences between earnings and cash flows. Timing is mentioned as a final form of earnings management, indicating that intertemporally a transfer of income takes place between two periods. When a firm uses aggressive accounting it is therefore 'borrowing' from the future, while conservative accounting leads to savings for the future.
In this research especially the manipulation of a particular account, the manipulation of accruals and the timing are important, since this research focuses on goodwill and goodwill impairment losses that can be reported periodically when indications exist for decreases in the value of the goodwill.

Besides different forms of earnings management, also different types can be distinguished in practice. In this paper only the types big bath accounting and income smoothing will be discussed, since these types of earnings management are important for this research as will be made clear in Chapter 5.
*Big bath accounting* is an example of the use of earnings management to decrease the earnings of the firm. As many as possible, losses and write-offs are incurred in one year. According to Mohanram (2003, pp. 2), big bath accounting is used by firms that 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 argumentation are given. At 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 'extra' incurred losses can be used to increase or smooth income in future years.

Another form of earnings management is *income smoothing*. With income smoothing, management wants to report a consecutive line of increasing earnings. In order 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, also called cookie-jar accounting. As Mohanram (2003, pp. 3) points out, this kind of accounting has two purposes. The first purpose 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 'inter-temporal' transfer of income between periods",* as Mohanram (2003, pp. 6) states. The second purpose of decreasing income, if income is higher than targeted, is to prevent expectations about the firm to rise. If the expectations about future firm earnings increase, future targets will be more difficult to reach. The consequence of this can be that the consecutive line of increased earnings is ended, because of one exceptional good result.

### 2.6 Summary and conclusion

In this chapter the topic of earnings management has been discussed. From hereon earnings management will be seen as defined by Schipper (1989). This implies that particularly the private gains of management form the basis for engaging in earnings management. There are two conditions necessary to make earnings management possible, accrual accounting and imperfect markets. Earnings management can be explained by the Positive Accounting Theory and the Agency Theory. These theories lead to three hypotheses regarding earnings management: the bonus plan hypothesis, the debt hypothesis and the political cost hypothesis. Recent research has added the importance of benchmarks to the list of incentives for earnings management. Different forms of earnings management were distinguished of which the manipulation of a particular account and the manipulation of accruals and timing are the most important for this research. Also two important types of earnings management were discussed, big bath accounting and income smoothing.

# *Chapter 3: Goodwill impairment*

## 3.1 Introduction

As mentioned earlier, 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.

This chapter will address both goodwill and impairment. In the next section, a definition of goodwill will be discussed and also a distinction will be made between purchased and internally generated goodwill. In the third section, the impairment test will be discussed into further detail, by using a 4-step process related to the regulation. The fourth section will then discuss some implications of the impairment test and the final section will give a short summary and conclusion of this chapter.

## 3.2 Definition goodwill

Before examining the impairment test, it is important to determine what is meant by goodwill. The IASB defines goodwill as "*an asset representing the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognised"* (IFRS 3, pp. 344). This definition implies that the amount of goodwill represents the estimated future benefits that can be generated from the acquired firm. Klaassen and Helleman (2004, pp. 911) define goodwill based on the balance sheet. They define goodwill as being the value of a firm on top of the value of equity that is visible on the balance sheet. It is a resultant from which the size depends on the one hand on the determination of the value of the business, and on the other hand the meaning of the term equity. Lander and Reinstein (2003, pp. 227-228) argue that entities should record goodwill only when they purchase another entire business, since goodwill represents the difference between the price paid for the entire business and all specifically identified assets. The goodwill therefore equals the purchased price of the acquired business less the fair market value of net tangible and intangible assets. It is however also possible that not the entire business is acquired. In that case, only the acquiring entity's portion of the goodwill is recognized. However, from the 1st of July 2009, it will also be possible to use the full-goodwill approach as discussed earlier, which permits that 100% of the goodwill of the acquired entity is recognized. On the other hand, Lander and Reinstein (2003, pp. 228) also emphasize the possible existence of internally generated goodwill, however the standards do not allow that this is being accounted for in the financial statements since no objective valuation method exists. From hereon, the term 'goodwill' therefore refers to purchased goodwill only.

### 3.3 Applying the impairment test

In this section, the impairment test will be discussed into further detail. In essence, an impairment test means that verification needs to take place whether any changes in the value of goodwill have occurred. The focus with this verification is on a possible decrease in value. This means that an increase in value is not being accounted for. The reason for this is that the standards do not allow that increases in value, with respect to the impairment test, are being accounted for in the financial statements (both equity and earnings). The underlying reason for this is that there is too much uncertainty with respect to the possibility of realizing this increase in value, which is the so called principle of realization.

When there is a decrease in value, as mentioned above, an impairment loss needs to be recognized. 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). In determining whether a goodwill impairment loss needs to be recognized, Dagwell et al. (2007, pp. 866-868) propose four steps. The first step involves that the recoverable amount needs to be ascertained of the relevant cash generating unit. Then the carrying amount of the net assets (including goodwill) needs to be determined which belongs to that particular cash generating unit. The rule of thumb to apply in this step is that an impairment loss needs to be recognised when the carrying amount exceeds the recoverable amount. The third step involves the determination of the value of the goodwill which needs to be accounted for in the financial statements, in the case that it is necessary to recognize an impairment loss. The fourth and final step includes reducing the carrying amount of the goodwill by the amount of the impairment loss that is determined. A more detailed description of this four-step process is included in Appendix 1.

### 3.4 Implications of applying the impairment test

In applying an impairment test in practice, 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. With respect to fair value, Lander and Reinstein (2003, pp. 228) for instance argue that it is always important that entities who are estimating expected future cash flows to measure fair value, rely on reasonable and supportable assumptions and projections. Also they should consider all available evidence to estimate such expected future cash flows because 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. 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) also argues that an additional layer of subjectivity is introduced when applying the impairment test. He also argues that this subjectivity comes from the assumptions made by management which are needed to carry out the impairment test (i.e. to determine the cash generating units, to allocate goodwill to them and to assess their recoverable amounts based on fair value estimates). Therefore, according to Ball (2006), the replacement of the annual amortization of goodwill with an annual impairment test provides managers with another tool for earnings management. A possible reason for management to use impairment as a tool to manage earnings is that they fear to be punished by the market in the case of impairment shortly after an acquisition. The market could 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). They find that, relative to a control sample of acquirers, firms announcing impairments are more likely to have overpaid for the target acquisitions made during the prior five years. Their tests also reveal that the impairment loss is positively correlated with indicators of initial overpayment and negatively correlated with the firm's post-acquisition return performance. Therefore, it appears that, for these firms, the value of goodwill may have been partly impaired at the outset due to initial overpayment at the time of acquisition.

The analysis of Bini and Bella (2007, pp. 913-914) also supports the reasoning that the degree of subjectivity associated with the application of an impairment test for goodwill provides plenty of opportunities for management to influence the impairment calculation. Their findings first show that *"the management's discretionary power in setting forth projections, also in the presence of its inability to meet the targets set at the time the business combination was announced, leaves scope to opportunistic behaviour intended to avoid impairment losses.* However, as Bini and Bella (2007, pp. 914) continue, management also has another tool at its disposal to mitigate the impact of the poor execution of its plans on the carrying value of goodwill, which involves the reduction of dividends extracted from the reporting unit, thus leading to a misallocation of capital among reporting units in a diversified group.

As a solution to the subjectivity that is associated with the application of the impairment test, Holterman (2004, pp. 273-274) opposes the development of generally accepted valuation procedures for impairment tests that should provide more guidance for draughters, auditors, and users of the financial statements. However, the question is raised whether this could decrease subjectivity enough to state that the impairment test would be more reliable. Since management is responsible for preparing the impairment calculation, it is questionable whether management would apply these generally accepted valuation procedures in a correct manner. For the auditor, this would probably be difficult to check, since management has more information than the auditor in this type of situation. Therefore, possibilities would still exist to influence the impairment test. Furthermore, it would be possible that a situation exists in which management would not have enough knowledge to apply these valuation procedures, which would also not decrease the level of subjectivity.

The existence of this level of subjectivity could therefore provide management with the opportunity to manage earnings in case the impairment test is not enough robust, as opposed by Knoops (2004, pp. 4). He argues that a new form of big bath accounting (see Chapter 2) could be developed that will lead to the recognition of large goodwill impairment losses at first, and which will lead to lower or less impairment losses in future years. It could even make it temporarily not necessary to recognize impairment losses.

### 3.5 Summary and conclusion

This chapter discussed the definition of goodwill and impairment. Goodwill was defined as being the estimated future benefits that can be generated from the acquired firm. Impairment of goodwill was defined as verifying whether any changes in the value of goodwill have occurred. Also four steps in the impairment process were discussed. Finally implications of applying the impairment test were discussed, indicating that a high level of subjectivity is associated with impairment tests. As a consequence of this subjectivity, management is provided with the opportunity to influence the impairment calculation and consequently the presented earnings in the financial statements.

# *Chapter 4: Managing goodwill impairments - empirical evidence*

## 4.1 Introduction

In continuance on the Chapters 2 and 3, this chapter will discuss empirical evidence regarding earnings management and the link that exists between earnings management and goodwill impairments. This will be done based on a discussion of prior empirical research performed by numerous authors.
The next section discusses some empirical evidence concerning the existence of earnings management based on contracting and capital market incentives. Section 4.3 will then discuss empirical evidence found concerning the link between earnings management and goodwill impairments. The chapter ends with a short summary and conclusion as well as an overview of the discussed empirical literature.

## 4.2 Empirical evidence for earnings management

As described in Chapter 2, three incentives for earnings management can be distinguished: capital market incentives, contracting incentives and regulatory incentives. For this research, especially the contracting incentives, but also the capital market incentives, are interesting to investigate since it is examined how the impairment of goodwill is being used as a tool for earnings management. Therefore empirical evidence that was found for this type of incentives will be discussed very briefly in the next section. As an implication, the two forms of earnings management as discussed in Chapter 2, big bath accounting and income smoothing, are also discussed here. This section will therefore contain the most relevant and important empirical literature about earnings management for this research.

### *4.2.1 Evidence of contracting incentives*

Even though the research done by Watts and Zimmerman (1978) cannot be categorized under the contracting and capital market incentives which are the most important for this research, but under the regulatory incentives, it is important to discuss this research here first. This particular research can be seen as the starting point for the development of the Positive Accounting Theory by Watts and Zimmerman (1986), since it investigates the factors that can influence the attitude of management towards accounting standards. Watts and Zimmerman (1978, pp. 112) investigated whether larger firms experiencing lower earnings as a consequence of changes in accounting standards, favoured the changes in these standards. They expected that certain factors would affect the cash flows of a firm, which in turn would be affected by the accounting standards. Watts and Zimmerman (1978, pp. 112) distinguished the following factors: '*taxes, regulation, management compensation plans, bookkeeping costs and political costs*'. These factors were combined into a regression model to test this relation. The model was applied to '*corporate submissions to the FASB's Discussion Memorandum on General Price Level Adjustments*'. The results supported expectations, indicating that larger firms experiencing lower earnings as a consequence of changes in accounting standards indeed favoured the changes.

The bonus of managers usually depends on the firms presented results. This provides managers the incentive to report results as high as possible to maximize their bonus. Healy (1985) investigated how bonus schemes affect the choice for accounting principles. To perform his research, he investigated 94 companies listed on the 1980 Fortune Directory. These firms belonged to the 250 largest U.S. companies. To test whether there was evidence for the bonus hypothesis, Healy used two methods. The first method was to analyze the accruals of the firm. The second method was to investigate changes in accounting methods. The results indicated that management is more likely to choose income-decreasing accruals in order to maximize their bonus payments when the upper bound of their bonus plan is reached. When these bounds are not binding, they are more likely to choose income-increasing accruals. Secondly, their voluntary changes in accounting methods are high when bonus schemes are changed.

Support for Healy's statement can be found with Guidry et al. (1999). They investigated the bonus hypothesis using independent business units rather than the aggregate firm during the period 1993-1995. Guidry et al. (1999, pp. 140) used the modified Jones model, Healy's proxy for discretionary accruals and an inventory reserve measure[4] for the research. The Jones and modified Jones model are described by Dechow et al. (1995). The modified Jones model is, as its name implies, a modified version of the Jones model. The goal of the Jones and the modified Jones model is to make an estimation of the discretionary accruals made by a firm. The Jones model was innovative at the time of development, since it does not assume constant non-discretionary accruals over time. A limitation of the Jones model is that the growth in sales is regarded as non-discretionary. Management however can influence sales by accelerating or delaying them. If sales are managed, a classification of the accruals as non-discretionary is not correct. For this reason the modified Jones model includes a variable that accounts for the change in credit sales. This variable has the effect that all changes in credit sales are accounted for as being earnings management. The reason to adapt the model for credit sales, but not for cash sales is that credit sales are easier to manage than cash sales. Using these methods, Guidry et al. (1999) reached the same conclusion as Healy (1985), indicating that the evidence is consistent with managers manipulating earnings in order to maximize their bonus payments on the short-term.

### *4.2.2 Evidence of capital market incentives*

Research whether managers engage in income smoothing has been performed by DeFond and Park (1997). The reasoning is that when income is higher than targeted, income can be decreased by using earnings management. Should, in a later period, income fall below the target, then the previously decreased earnings can be used to boost income. To investigate these relations, which are based on capital market incentives, DeFond and Park used a sample that consisted of all the available observations

[4] An inventory reserve measure makes up for not selling all inventory at the cost to the firm. It is therefore a deduction from earnings for the purpose of fairly and reasonably representing the value of the inventory. (www.answers.com)

on the 1994 Compustat Industrial. To estimate the discretionary accruals a variation of the Jones model was used. DeFond and Park (1997) found that a mere eighty-nine percent of the observations that are predicted to smooth earnings actually act consistently with the expectation. Managers were found to use earnings management to smooth income both when income was higher than targeted and when it was lower than targeted.

Smoothing income can be reached by using a variety of discretionary accounting decisions by management. Peek (2004) conducted research regarding the use of provisions in earnings management. He investigated whether Dutch firms during the 1990's used the accounting discretion firms have in recognizing and reporting provisions to manage their earnings. The goal was to test whether the estimates of unexpected changes in provisions can be associated with a firm's current and following year's earnings changes systematically. To conduct his research, Peek (2004) used the available data regarding provisions from the annual reports of 134 non-financial firms. These firms were listed on the Amsterdam Stock Exchange between 1989 and 2000 for at least three years. Because the firms in the sample were listed for at least three years the sample consisted of 975 firm-year observations. After analyzing the results, he concluded that when firms have high current income, they report unexpectedly positive changes in provisions. This means that provisions are higher than expected or that they smooth their income. The higher provisions can be seen as a reserve which can be used in future periods when income is lower than expected.
If current income of firms is lower than the income of the previous year, the use of unexpected changes in provisions are a benchmark for a firm's future results. Firms that have unexpectedly positive changes in provisions will have less persistent earnings decreases than firms that report unexpectedly negative changes in provisions. This is consistent with the big bath theory, as explained by Healy (1985). The firms that report unexpectedly positive changes in provisions lower their income in order to increase future income. As with income smoothing, they build up reserves which can be used in future periods when earnings are lower than expected. However, when firms report unexpectedly negative changes in provisions, they use up the previously mentioned reserves or actually borrow earnings from the future.

Although earnings management by its definition can be associated with disturbing a true view about the firm, Barth et al. (1999) and Tucker and Zarowin (2006) reveal some positive effects of earnings management. Barth et al. (1999) provide evidence that income smoothing has an effect on the price-earnings relation of a firm. To investigate this relation, Barth et al. (1999) derived their regression equations from two valuation models as developed by Miller and Modigliani (1966)[5] and Ohlson

[5] It is worth noting that restrictive economic assumptions form the basis for the model of Miller and Modigliani (1966). The assumptions underlying the model are capital markets that are perfect, assets provide a uniform income stream, investors behave in a rational way and tax does not exist. In the model of Miller and Modigliani (1966) the value of a firm is calculated by dividing one through the market interest rate, and then multiplying this number with the permanent earnings of the firm.

(1995)[6], which in turn are derived from the expectations concerning future dividends. Based on these models, Barth et al. (1999) make estimations of the relation between earnings and prices, and the relation between earnings and prices and the bookvalue of equity. By assuming accounting earnings as a proxy for permanent earnings, Barth et al. (1999) therefore start with adjusting the model of Miller and Modigliani (1966) in order to test whether a firm with a pattern of increasing earnings has a higher price earnings relation than a firm without a pattern of increasing earnings. For additional tests, different versions of this resulting regression equation are used. The sample used by Barth et al. (1999) consisted of all firms on Compustat for the period 1982 until 1992. They found that income smoothing has a positive effect on the earnings multiple, which means that the stock of firms who smooth income are priced at a premium. A firm with a pattern of increasing earnings has an earnings multiple that is significantly higher than for a firm without a pattern of increasing earnings. However, should this pattern be broken, the earnings multiple will reduce significantly. The positive effect of the smoothing of income is then reduced.

A possible explanation for this phenomenon can be found with Tucker and Zarowin (2006). Tucker and Zarowin (2006) have investigated whether income smoothing can be associated with improving earnings informativeness, or that it disturbs the accounting information of current and past earnings about their future earnings and cash flows. To perform their research, Tucker and Zarowin (2006) used the approach of Collins et al. (1994). This approach examines how much information of future earnings is reflected by the change in current stock prices. According to Tucker and Zarowin (2006, pp. 252) this approach is superior to estimating the direct relationship between a firm's future and its current and past earnings for two reasons. First they state that not only realized earnings are used to predict future income, but other sources of information can be used as well. Secondly, changes in future earnings may not have an effect on current earnings, but they can be included in stock prices. Tucker and Zarowin (2006) investigated the association between the stock returns of a company in the current year and future earnings of that company. The model that has been used in the research is the cross-sectional version of the Jones model, as modified by Kothari et al. (2005). Kothari et al. (2005) adjusted the Jones model, because if firms perform very well, or extreme as they describe it, accruals will be specified in a wrong manner. In the case of extreme performance, firms will have higher accruals. The Jones model will however specify more accruals as being discretionary, indicating more earnings management. To correct this flaw of the model, Kothari et al. (2005) included the return on assets variable. In this way a correction for the performance of the firm is taken into account. The sample consisted of the 2004 version of Compustat's combined industrial annual data file over the period 1993-2000. From this data firms in the financial and regulated industries were excluded. Tucker and

[6] The basis for the model of Ohlson (1995) is that share prices are the present value of future dividends paid by the company. The market value of a firm is expressed as the present value of these dividends and the present value of expected abnormal earnings by the firm in the future.

Zarowin (2006) found that the stock price of a high-smoothing firm impounds future earnings more than stock prices do at low-smoothing firms. This can be explained by the income smoothing theory. The purpose of income smoothing is to report a consecutive line of increasing earnings. This implies that firms who smooth more than others will have a more predictable pattern of earnings. According to the results of alternative testing, this conclusion is robust. Although the research by Tucker and Zarowin (2006) provides outcomes that align with the theory, it contains two potential flaws. The first potential flaw is that the basis for the research is market efficiency. If markets are not efficient the outcomes of the research may be completely different. And secondly, a potential measurement error exists in the income smoothing measure because a manager's discretionary behaviour is unobservable.

## 4.3 Empirical evidence for managing goodwill impairments

This section will discuss the link between earnings management and the impairment of goodwill based on a summary of prior research done on this subject. A distinction will be made between different kinds of research that give other insights into this subject. Amongst others, models which incorporate the influence of goodwill impairment announcements on the capital market and research that does not take into account these effects but instead looks at the effect of a CEO change will be discussed.

### *4.3.1 Main evidence of managing goodwill impairments*

Zucca and Campbell (1992) performed empirical research to test the link between earnings management and goodwill impairments. In using a random walk model[7], they assume that there is no pattern in the path of expected earnings, which means that the earnings follow a path that can be called 'random'. The consequence of this is that the future course of the earnings is unpredictable and that the best forecast of the earnings is equal to their present value plus an unpredictable negative or positive random error incorporated in the model. 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. Most studies, however, found that write-downs were taken when the firm was already performing poor, consistent with bathing behaviour.

As already mentioned briefly, 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 (see Appendix 2), 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 (smooth-

[7] http://www.businessdictionary.com

ing) or when they are 'unexpectedly' low (big bath accounting). This evidence is therefore in accordance with the evidence of the existence of income smoothing and big bath accounting as discussed in the previous section and the results of the research of Zucca and Campbell (1992).

In continuance on the earlier discussion of the theory, 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) further investigate the extent to which proxies for managerial incentives to manipulate earnings and proxies for asset impairments explain impairment decisions. They use a weighted tobit model[8] to estimate the importance of impairments and earnings management variables in explaining both the existence and amount of a firm's write-off decisions (see Appendix 3). In using this model, Francis et al. (1996, pp. 134) 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

[8] A tobit model can, in its simplest form, be described as an econometric model in which the dependent variable is censored, which means that values below zero are not observed. (http://economic.about.com)

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.

Other research supporting the link between earnings management and goodwill impairments is done by Beatty and Weber (2006). They examine several potentially important economic incentives that firms face when making impairment decisions. In using a regression model as depicted in Appendix 4, 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, see Appendix 4) 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.

The final research that will be discussed here is performed by Henning et al. (2004, pp. 119) (see Appendix 5). The research method used is 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) (see also section 4.3.3). 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. Regarding the timing of goodwill write-offs, according to the results of 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.

### *4.3.2 The effect of a change in CEO*

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 (see Appendix 6), 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. More recent evidence for this relation is provided by the research of Wells (2002). He also found evidence of downwards earnings management particularly for external CEOs, but more in general for abnormal or extraordinary items and not necessarily in the context of goodwill impairments. This research will therefore not be discussed into further detail here.

The results of the research by Lapointe-Antunes et al. (2008) provide additional evidence for the conclusion that impairments are reported in the case of a CEO change. They use a multivariate tobit model (see Appendix 7) to assess the determinants of transitional goodwill impairment losses, which is in accordance with the method used by Francis et al. (1996) as discussed in the previous section. 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. 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.

### *4.3.3 Reactions on the capital market*

Research focusing more on reactions of the capital market after the announcement of goodwill impairments, in other words the value relevance of goodwill, was performed by Elliott and Shaw (1988, pp. 114) as already mentioned briefly in relation to the research of Henning et al. (2004). They based their research on a regression analysis (see Appendix 8), which is consistent with the research approach adopted by Van de Poel et al. (2008), Beatty and Weber (2006), Henning et al. (2004) and Masters-Stout et al. (2007). Elliott and Shaw (1988) find that "*firms announced an above-average number of dividend decreases and sustained more frequent bond-rating decreases throughout the investigated period compared to other industrial firms. This result is consistent with the firms' negative stock performance during the period and indicates that the write-offs occur during a period of sustained economic difficulty.*" This can be explained as follows. In times of economic difficulty the firm performs poorly. This performance is reflected in the stock returns and dividend pay-outs. Consequently, impairments may be necessary if the firm and its assets (including goodwill) are no longer worth the same as before the period of poor performance. Elliott and Shaw (1988) further documented "*a significant one- and two-day industry-adjusted negative share return on average when the write-offs were disclosed. The cross-sectional variation in these returns is associated with the relative size of the write-off after controlling for other unexpected components of earnings when the announcement corresponds to disclosures of annual earnings. In the months following the write-off, industry-adjusted returns remain negative*." These findings also support that the impairment was done in a time of economic difficulty and that the disclosure of an impairment loss has a negative effect on share returns.
Zucca and Campbell (1992) also focused on the capital market and found that there was no significant market reaction to write-off announcements. So this finding is in contrast to the findings of Elliott and Shaw (1988).

### *4.3.4 Other insights*

The research done by Li et al. (2005, pp. 16), as already discussed briefly in Chapter 3, is based on the identification of 385 announcements of transition goodwill impairment losses made by U.S. firms from January 2002 to December 2003 in the Lexis-Nexis database. The sample included firms which announced a transition goodwill impairment loss for the first time after January 1st 2002. So this research provides another insight than the previously discussed researches in that it incorporates the announcement of goodwill impairment losses, meaning that this research is based on the initial disclo-

sures. The regression models that are being used have been incorporated in Appendix 9. Based on this particular sample and the regression models, Li et al. (2005) find that, relative to a control sample of acquirers, firms announcing impairments are more likely to have overpaid for the target acquisitions made during the prior five years. Their tests also reveal that the impairment loss is positively correlated with indicators of initial overpayment and negatively correlated with the firm's post-acquisition return performance. This negative correlation with the post-acquisition return performance is consistent with the earlier discussed findings of research from Elliott and Shaw (1988).

Another insight on the link between earnings management and the impairment of goodwill is given by research of Hayn and Hughes (2006). Based on a prediction model (see Appendix 10), they find that "*there exists, on average, a time lag of three to four years between the deterioration in the performance of the acquired business that gave rise to the goodwill and the actual write-down of that goodwill. Given that some businesses could reasonably be expected to recover from short periods of poor financial performance, this 'waiting period' over which performance deteriorates, yet no write-off is recorded, may not be particularly excessive.*" So Hayn and Hughes (2006, pp. 226) actually suggest that for some firms, this 'waiting period' which is being accounted for is acceptable, since it gives the firm the chance to recover and that this behaviour can therefore not be seen as delaying impairments. For about one-third of the firms, however, they find that the poor performance of the acquired entity appears to persist for at least six to ten years before a write-off is taken. Therefore they concluded that this substantial delay may reflect the exercise of managerial discretion in specifically the timing of goodwill write-offs to meet certain reporting objectives.

### *Conclusion*

Overall, the discussed evidence in this section suggests that company's impairment decisions are influenced by managerial reporting incentives other than just purely economic factors (see also Van de Poel et al., 2008). The role of these incentives in the impairment decision is associated with the potential for discretion induced by certain firm characteristics and the flexibility in the accounting standards in place. The discussed research has given different insights about the link between earnings management and goodwill impairments. In this paper, the insights discussed in section 4.3.1 will mainly be used for determining a model that can examine this link, but also the effects of a change in CEO will be taken into account from section 4.3.2.

### 4.4 Summary and conclusion

This chapter discussed empirical evidence found regarding the existence of earnings management in practice. The evidence suggests that management indeed tries to manage earnings by taking a bath or smoothing income. Also, evidence was discussed regarding the link between earnings management and goodwill impairments. Overall, the evidence suggests that company's impairment decisions are influenced by managerial reporting incentives other than just economic factors. The role of these incentives in the impairment decision is associated with the potential for discretion induced by certain firm characteristics and the flexibility in the accounting standards in place.

Appendix 11 provides an overview of the most important empirical literature discussed in this chapter in the area of earnings management. Appendix12 provides an overview of the most important empirical literature discussed on the link between earnings management and goodwill impairments.

# *Chapter 5: Hypothesis development and research design*

## 5.1 Introduction

Based on the discussion in the previous chapter of empirical evidence for the use of earnings management and goodwill impairments that are being used as a tool for earnings management, it is now possible to develop the empirical part of this research. The development of this research will be divided into a number of steps. The first step is the development of hypotheses based on the previously discussed literature. This will be explained in the next section. The second step is to find or develop a model that can be used to test the developed hypotheses. The model that will be used will be discussed in section 5.3. The third step of the research design involves the determination of the sample, which will be discussed in section 5.4. The final and fourth step will be discussed in section 5.5 and involves the gathering of data from different sources. The chapter ends with a short summary and conclusion.

## 5.2 Development of hypotheses

The research of Van de Poel et al. (2008) is the starting point for this empirical research. Therefore the same reasoning as used in their research can be applied here. In their research, Van de Poel et al. (2008, pp. 13-14) argue that agency contracts between managers and shareholders are designed to align managerial incentives and shareholder benefits. They for instance refer to stock options and earnings-based bonus plans that might encourage managers to maximize shareholders' wealth by maximizing earnings. Therefore, it is expected that managers have incentives to postpone impairments in order to maximize their wealth. This view can be supported by the empirical evidence of Hayn and Hughes (2006, pp. 226) as discussed in section 4.3.4 regarding the timing of goodwill impairments. The evidence indicated that there exists a substantial delay in the accounting for write-offs. This can reflect the exercise of managerial discretion in the timing of goodwill write-offs to meet certain reporting objectives.

However, in certain other circumstances, it may also be possible that maximizing reporting earnings may not be the optimal strategy for managers. Kirschenheiter and Melumad (2002, pp. 761) elaborate on one rationale for income-decreasing behaviour by managers. They present a model wherein large earnings surprises reduce the inferred precision of the earnings number, and thereby dampen the effect on firm value of reporting higher earnings, which leads to a natural demand for smoother earnings. Therefore, managers have incentives to smooth earnings in case of high unexpected earnings and, to underreport earnings by the maximum and take a 'big bath' in case of sufficiently low earnings. In particular, they could minimize reported earnings by not postponing impairments and/or by accelerating impairments. This indicates that especially the timing of goodwill impairments can have a great impact on reported earnings. The timing can be influenced by management in using the discretion that

is incorporated in the application of an impairment test, more specifically the assumptions which need to be made in calculating whether the recognition of an impairment loss is necessary. Therefore the impairment test provides management with the necessary discretion to engage in these forms of earnings management. This view is supported by research as discussed in section 4.3.1 (Zucca and Campbell, 1992; Van de Poel et al., 2008; Alciatore et al., 1998; Francis et al., 1996; Beatty and Weber, 2006; Henning et al., 2004).

Based on the discussion of empirical evidence about the link between earnings management and goodwill impairments in the previous chapter, it is now possible to develop multiple hypotheses. The first hypothesis can be linked back to the discussion of big bath accounting. The reasoning for this is as follows. In the case that 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 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 back to the bonus plan hypothesis discussed in section 2.4 and 4.2. 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 can therefore be developed:

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

In order to test this hypothesis, it is important to determine a proxy for the use of big bath accounting that 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 section 5.3.2. 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 that will be developed in the next section.

The reasoning for the development of the second hypothesis is based on earnings management in the form of income smoothing. In 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 the bonus has already been reached and 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 above described theory about the bonus plan hypothesis and income smoothing, 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. This variable is used to determine whether the firm's earnings deviate (substantially) upward from the industry median. When this is the case, the indication is found that management has an incentive to smooth earnings. In section 5.3.2 the precise measurement of this variable is discussed into more detail. 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 section 4.3.2 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 discussed theory about big bath accounting it is therefore also hypothesized that:

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

To make it possible to test this hypothesis a proxy is incorporated in the model only now for measuring big bath accounting 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, see also Appendix 6) and Francis et al. (1996, pp. 122-124, see also Appendix 3). 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 (as discussed in the previous chapter), 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. This means that it is expected that Hypothesis 3 will hold when being tested by the model.

## 5.3 Development of model

This section will discuss the development of the model that will be used to test the hypotheses as developed in the previous section. However, first it is important to discuss briefly the statistical background of the model. Van de Poel et al. (2008, pp. 13) argue that irregularities in the goodwill impairment test can lead to two types of errors in financial reporting. On the one hand, firms can report an impairment loss when it is not appropriate, in other words when the fair value of goodwill is higher than its book value. This is also called a 'Type I' error. On the other hand, firms can also fail to report a goodwill impairment loss in the case that goodwill is overvalued. This leads to a 'Type II' error. This reasoning is illustrated in Figure 1.

To link this reasoning back to the developed hypotheses, it can be seen that Hypothesis 1 and 2 imply that it is expected that managers are encouraged to underreport earnings in the case of large earnings surprises. Firms then have incentives to report all impairments (less Type II errors) and even accelerate impairments (Type I errors) to boost performance in the future (Van de Poel et al., 2008, pp. 15).

| | | *Financial reporting* | |
|---|---|---|---|
| | | *Impairment reported* | *No impairment reported* |
| ***Goodwill*** | *Fair value > Book value* | Type I error | correct |
| | *Fair value < Book value* | correct | Type II error |

*Figure 1: The impairment matrix*

Source: Van de Poel et al (2008, pp. 31)

To be able to test the hypotheses as developed in the previous section, a model needs to be developed. An important model for this research was developed by Van de Poel et al. (2008, see Appendix 2). Their model was especially developed to investigate whether reporting incentives played a role in the goodwill impairment decision. In their model a number of variables are incorporated that reflect the reporting incentives big bath accounting and income smoothing, but also variables are incorporated which reflect the economic conditions of the firm (sales, cash flows and industry ROA) and which control for firm-specific aspects like the size of the firm. Since so many factors are incorporated, this model is appropriate to use for this research since the impairment decision is complex and such factors as included in this model can all influence the impairment decision.

Another model which would be applicable to this research is the model of Francis et al. (1996, see Appendix 3). This model also takes into account variables measuring the performance of the firm by focusing on earnings, as well as a number of variables indicating other economic conditions of the firm (e.g. change in ROA, change in industry sales/ROA/book-to-market ratio). This model however focuses more on the effects on the capital market, since also returns on securities and the like have been incorporated in the model. Therefore this model is less appropriate as a basis for this research, since it is not the intention to investigate this type of relation here. However, the model does incorporate two variables for measuring the performance as 'poor' or 'good', which can be used as an indication under which of these circumstances big bath accounting or income smoothing can be applied by management.

The model by Beatty and Weber (2006, see Appendix 4) can also be used for research on goodwill impairments. This model incorporates many variables which can influence the impairment decision, for instance the price per share and daily returns, the existence of earnings-based bonus plans (=reporting incentive), the number of years a CEO has held this position and some control variables like the size of the firm and the ratio of debt to total assets. So this model can be used for investigating the impairment decision, however it does incorporate a lot of variables that are concerned with the effects on the capital market. Therefore this model is also less appropriate for this research. However, the model does incorporate the effect concerned with the CEO position, which can be useful.

A model that can be appropriate for this research is the model of Lapointe-Antunes et al. (2008, see Appendix 7). This model incorporates many variables which can all have an effect on the impairment

decision. Examples of this are the opening balance of goodwill, the return on equity, changes in the CEO position, percentage of compensations paid in bonuses, value of stock options of top paid executives, whether the firm is cross-listed and so on. Also control variables like size and an industry distribution are incorporated. However, many of these variables are measured as dummy variables, indicating that they can only take the value of 0 or 1. This may not be the best method to measure the effects of such factors on the impairment decision. It would be better to include actual figures since the magnitude of these figures can also have an influence on the impairment decision, which would otherwise not be tested when applying the model. Therefore this model is also less appropriate.
Hayn and Hughes (2006, see Appendix 10) also developed a model to investigate the impairment decision. This model is focused more on the acquisition itself that has caused the goodwill to arise on the balance sheet. Therefore acquisition costs and acquisition activity are factors that are incorporated. Also control variables like return on assets, the change in sales, but also the period returns are used. However, many of these variables are dummy variables, which eliminates the effect of the magnitude of these figures on the impairment decision. Therefore, this model is less appropriate as well.
The models of Henning et al. (2004, see Appendix 5), Elliott and Shaw (1988, see Appendix 8) and Li et al. (2005, see Appendix 9) are also not appropriate for this research since they are quite simplistic. They only incorporate a small number of variables, while the impairment decision is much more complex and can be influenced by many factors. This also holds for the model of Masters-Stout et al. (2007, see Appendix 6), but this model can be used to investigate CEO changes into more detail. This model, more specifically the measurement of the CEO change, is therefore interesting since this research also investigates the effect of a CEO change on the impairment decision.

Based on the discussion of the different models from prior research, the conclusion can be drawn that the model of Van de Poel et al. (2008) is the most appropriate model to use as a starting point for this research. The model 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.

Since the model of Van de Poel et al. (2008) is the starting point for the development of a model, adjustments are made to fit the model to the purpose of this research. The following two adjusted models that result will be used to test whether goodwill impairments are being used by management to engage in earnings management. The next subsections will discuss why each variable is included and how it should be measured. Subsection 5.3.1 focuses on the dependent variables, while subsection 5.3.2 focuses on the independent variables.

***Model 1***

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

***Model 2***

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

### 5.3.1 Dependent variable

In this research the dependent variable ***$IMPAIRMENT_{it}$*** is used to represent the impairment decision. This variable will be measured as a dummy variable that has the value of 1 if a firm reports a goodwill impairment loss in year t and 0 otherwise. Following research discussed in Chapter 4 by Beatty and Weber (2006), Henning et al. (2004) and Hayn and Hughes (2006), this variable is applied as a dummy variable. However, this method does not take into account that the amount of the reported impairment can also be an important issue compared to only the decision to report an impairment loss or not. This is contradicted by a statement of Van de Poel (2008)[9], who argued that no significantly different results would be generated when using amounts instead of a dummy variable. To investigate whether this statement can also be applied to this research, there will be controlled for the effect of the amount of the goodwill impairment loss by performing the same analysis for a second time, only then by filling in the goodwill impairment amounts instead of the dummy variable. The dependent variable will therefore be ***$IMPAIR\_AMOUNT_{it}$*** in the second model. When filling in amounts in such an analysis, it is however necessary to control for the size of the firm, so that the relative size of the impairment instead of the absolute amount is being measured, otherwise the results could be distorted. Therefore the dependent variable $IMPAIR\_AMOUNT_{it}$ will be measured as the reported impairment amount deflated by total assets at the end of year t-1. This method for measuring the independent variable is in accordance with the model used by Lapointe-Antunes et al. (2008, see Appendix 7). Also it is partly in accordance with the model of Francis et al. (1996, pp. 122-124, see Appendix 3) since they incorporated a combination of the models using a dummy variable and the models using amounts and therefore a justification is found for the use of both methods.

[9] A document has been received from drs. C. Knoops at the Erasmus University in Rotterdam in January 2009 providing the results of Van de Poel et al. (2008) when the impairment loss amounts instead of a dummy variable were used in the model. The results showed no significantly different results when using amounts.

### 5.3.2 Independent variables

This subsection will discuss the independent variables that will be incorporated in the model. It is important to notice that three different kinds of independent variables will be used to explain the dependent variable. First of all three variables will be included that are specifically directed towards the testing of the three developed hypotheses. Also three variables are incorporated as proxies for the economic conditions with which the firm is confronted. The last three variables fall into the category of control variables. These variables control for the effect of the size of the firm, but also take into account differences that can exist between different industries. The reason for including these variables will now be discussed into more detail.

The first two variables are related to reporting incentives by management. How they will be included in the model depends on the use of the dependent variable as discussed in subsection 5.3.1. When the regression is performed by using $IMPAIRMENT_{it}$ as a dummy variable, the variables $\boldsymbol{BATH_{it}}$ and $\boldsymbol{SMOOTH_{it}}$ will also be measured as dummy variables. This is consistent with the model of Van de Poel et al. (2008, pp. 19/22), that has proven that these variables have a significant influence on the impairment decision at the 5% and 1% level, respectively. The variable $BATH_{it}$ is included in the model to test Hypothesis 1 and will have a value of 1 if the change in firm i's pre-impaired earnings before taxes 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. In this case, earnings are 'unexpectedly' low. $BATH_{it}$ is therefore a proxy for the use of big bath accounting by management. This indicates that 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. The variable $SMOOTH_{it}$ is included to test Hypothesis 2 and will have a value of 1 if the change in firm i's pre-impaired earnings before taxes 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. In this case, earnings are 'unexpectedly' high. $SMOOTH_{it}$ is therefore a proxy for income smoothing. This indicates that a positive relation will be found here as well since high earnings indicate a high performance which needs to be smoothed by reporting an impairment loss.

As described in subsection 5.3.1, the same regression will be performed twice, only then by using the variable $IMPAIR\_AMOUNT_{it}$. In that case the variables $\boldsymbol{BATH2_{it}}$ and $\boldsymbol{SMOOTH2_{it}}$, will be used as described by Francis et al. (1996, pp. 122-124, see also Appendix 3). These variables (only named POOR and GOOD in their research) have both proven to have a significant impact at the 1% level (when applying the generic tobit model) on the impairment decision (Francis et al., 1996, pp. 125). $BATH2_{it}$ will be measured as a semi-dummy variable. The variable will have 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) in year t less the operating earnings in year t-1, divided by total assets at the end of year t-1. $SMOOTH2_{it}$ will be measured as the unexpected earnings

less the write-off (deflated by total assets at t-1) if this resulting amount exceeds zero, and 0 otherwise. The reasoning for including these two variables in the second model is the same as for $BATH_{it}$ and $SMOOTH_{it}$, only now it is tested whether specifically the higher or lower level of unexpected earnings has a positive effect on the impairment decision. Important to notice is that the reported impairment loss has been deducted from the expected earnings for this variable because the reported impairment amount influences whether the level of earnings can be classified as unexpectedly high or just high. Only when earnings are unexpectedly high (meaning that they are in excess of the impairment amount), the reporting incentive of income smoothing could play a role since then earnings can/need to be smoothed to present a consecutive line of increasing earnings. This reporting incentive therefore would not play a role when earnings are high like was expected to a certain extent. Noticeable is that the write-off has not been deducted from earnings for the measurement of big bath accounting since then management is not concerned with a trend in earnings that can be broken.

The third variable is called $\boldsymbol{CEO_{it}}$ and is incorporated to test Hypothesis 3. It concerns the third reporting incentive in the model. This variable will be measured as a dummy variable. This means that the variable $CEO_{it}$ will have a value of 1 if the firm experienced a change in the CEO position, and 0 otherwise. To determine whether a change in CEO has occurred, the focus will be on the year preceding the impairment and the year of impairment, which means that only the years t-1 and t will be taken into account. The reason for this time horizon is based on the theory of big bath accounting. This theory is used to explain why new CEOs will have an incentive to pass a weaker performance in the first years onto the previous CEOs to loose their inheritance, as discussed before. The incentive for taking a bath will be the strongest in the year of the CEO change (year 1) or the year immediately after the change in CEO (year 2). Therefore these years will provide the greatest opportunities for taking a bath, which indicates that a time horizon of two years in total (year t-1 and t) will be sufficient. The developed time line in the following figure makes this reasoning more clear.

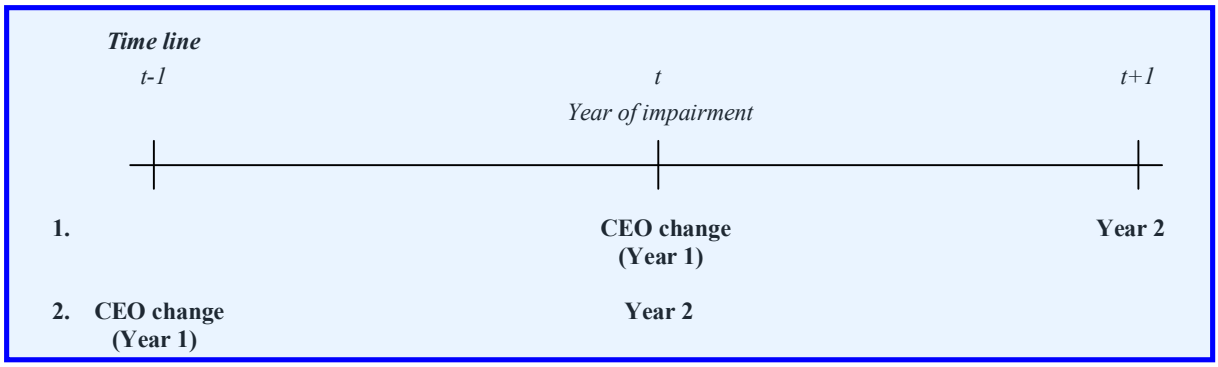


*Figure 2: A change in CEO and goodwill impairment recognition*

As can be seen in Figure 2, the first option is that the year of impairment (t) is the same as the year in which a change in CEO takes place. In this situation, the CEO has a strong incentive in the first year to loose the inheritance of its predecessor, as explained earlier. This strong incentive can be derived from the fact that in the same year an impairment loss is actually being recognized, which can be seen as an indication of big bath accounting. The second option is that in the year preceding the recognition of an impairment loss (t-1), a change in CEO has taken place. In this situation, the incentive for recognizing an impairment loss peaks in the second year (t) that the new CEO has this function. One possible explanation for this can be that the new CEO has taken the position at the end of a (book) year. This can lead to the recognition of the inheritance of the previous CEO in a later stage, more specifically in the second year he holds office. Therefore the impairment loss will be delayed and will not be recognized until the second year. The two options thus justify the chosen time horizon of two years (t-1 and t).
It is expected that a positive relation will be found between the variable $CEO_{it}$ and the impairment decision. Also it is expected that a positive relation will be found between this variable and the amount of the impairment loss that is being recognized. (Masters-Stout et al., 2007, pp. 6) This will be tested in the second regression analysis with $IMPAIR\_AMOUNT_{it}$ as the dependent variable.

The fourth variable that is included is the variable $\boldsymbol{\Delta SALES_{it}}$, which is a firm-specific factor that is associated with measuring the economic condition of the firm (Van de Poel et al., 2008, pp. 21). This variable has proven to have a significant effect at the 1% level by Van de Poel et al. (2008, pp. 36) and will be measured as the change in firm i's sales from year t-1 to year t, deflated by total assets at the end of year t-1. When the firm is performing poor, this could be an indication of why large impairment losses were recognized in a certain year and therefore it is expected that the variable $\Delta SALES_{it}$ will have a negative effect on the impairment decision.

The fifth variable that will be used is $\boldsymbol{\Delta OCF_{it}}$, which has also proven to have a significant effect at the 1% level (Van de Poel et al., 2008, pp. 36). This variable is included because it is also a firm-specific factor that is associated with the economic condition of the firm, as described previously for $\Delta SALES_{it}$ (Van de Poel et al., 2008, pp. 21). It is therefore expected that a negative relation will be found between this variable and the impairment decision, since the recognized impairment loss will be higher when the firm is performing poor. The variable $\Delta OCF_{it}$ is measured in the model as firm i's change in operating cash flows from year t-1 to year t, divided by total assets at the end of year t-1. This is consistent with the variable $\Delta CFO_{it}$ in the model of Van de Poel et al. (2008, pp. 21). However, this variable is renamed to avoid confusion with the variable $CEO_{it}$. The other models depicted in the Appendices 3 through 10 do not incorporate such a variable, but since the model of Van de Poel et al. (2008) is the starting point for this research, their approach is followed. Also it can be a useful explanatory variable since it is a firm-specific factor which can be used to explain differences between firms and/or

industries when the analysis proves that it has a significant effect on the impairment decision. This is the main reason why this variable is included.

The sixth variable that will be incorporated in the model is $\Delta indROA_{it}$. This variable controls for the economic condition of the firm only now as seen in relation to the industry in which a firm is active. The variable will be measured as the percentage change in firm i's industry return on assets (ROA) from year t-1 to year t. This variable has proven to have a significant impact on the impairment decision at the 5% level by Van de Poel et al. (2008, pp. 36). Francis et al. (1996, pp. 122-124, see also Appendix 3) and Hayn and Hughes (2006, pp. 236-237, see also Appendix 10) also use the return on assets in their model, however they see this ratio on the firm level instead of looking at the ROA for the entire industry in which the firm operates. Since the sample will be divided into multiple industries, as will be discussed in the next section into further detail, the method of Van de Poel et al. (2008) will be followed.
It is expected that a negative relation will be found between this variable and the impairment decision in this research, since a poor performance can be associated with higher impairments. It is very useful in this research to control for the economic performance of the industry, since the sample will be divided into multiple subsamples based on a distribution into industry groups. The inclusion of this variable therefore makes it possible to compare the figures between these different industries. This would not be possible when the ROA at firm-level would be included, instead of the ROA for the entire industry in which a firm operates.

The seventh variable to discuss is a control variable that has proven to have a significant influence at the 1% level on the goodwill impairment decision (Van de Poel et al., 2008, pp. 36), is $GOODWILL_{it}$. The reasoning behind the inclusion of this variable is that a firm that has a higher amount of goodwill in its asset composition might incur more goodwill impairments because the relative amount of goodwill exposed to the impairment test is greater (Lapointe-Antunes et al., 2008, pp. 44). Therefore the expected relation between this variable and the impairment decision is positive. The variable $GOODWILL_{it}$ is measured in the same way as was done by Van de Poel et al. (2008, pp. 21), which is '*the ratio of firm i's opening balance of goodwill on total assets*', measured at t-1. This is consistent with the method of measuring goodwill that was used by Masters-Stout et al. (2007, pp. 6, see also Appendix 6) and Lapointe-Antunes et al. (2008, pp. 43, see also Appendix 7). Therefore goodwill deflated by total assets will be used in the model to control for the effect of the goodwill opening balance on the impairment decision. Important to notice is that deflating the goodwill opening balance by total assets will control for heteroskedasticity when performing the analysis.

The eight variable that will be used has also proven to have a significant effect at the 1% level on the impairment decision. This is the variable $\boldsymbol{SIZE_{it}}$ that is measured by Van de Poel et al. (2008, pp. 21) as '*the natural logarithm of firm i's total assets*'. This variable is included to control for its effect on the impairment decision (Van de Poel et al., 2008, pp. 20). It is expected that there will be a positive relation between the size of the firm and the impairment decision, meaning that larger firms will be more likely to recognize an impairment loss than smaller firms. Lapointe-Antunes et al. (2008, pp. 43, see also Appendix 7) also used total assets to measure the size of the firm. On the other hand, Henning et al. (2004, pp. 114, see also Appendix 5) and Francis et al. (1996, pp. 122-124, see also Appendix 3) use sales to measure the size of the firm. The approach of Van de Poel et al. (2008) will be followed here which means that total assets will be used as a measure of the size of the firm, since the variable sales has already been incorporated in the model to measure the economic condition which the firm is confronted with.

The ninth variable that will be incorporated is $\boldsymbol{INDUSTRY_{it}}$. This variable is derived from the model of Lapointe-Antunes et al. (2008, pp. 43, see also Appendix 7) and will be measured as a dummy variable to divide the sample into multiple industries. They use in their research the following industry groups: energy, materials, industrial, consumer discretionary, consumer staples, health care, financials, information technology, telecommunications and utilities, according to the TSX Indices as given by Compustat. Each firm in their sample is assigned to one of these industry groups, ranging from 1 through 10. A similar division as used by Lapointe-Antunes (2008) will be used in this research, which is the Industrial Classification Benchmark Industry division (ICB). This will be explained into further detail in section 5.4 where the research sample is discussed. A major difference for this research in comparison to the research of Lapointe-Antunes et al. (2008) is that financials and insurance companies (as well as real-estate agents) will be excluded based on the sample of Van de Poel et al. (2008, pp. 18). Another reason is that financial companies have very different laws and regulations to comply with and are therefore difficult to compare to companies in other industries. This will therefore lead to a similar industry division based on the nine remaining industry groups mentioned by Lapointe-Antunes et al. (2008, pp. 43). It is not clear what the effect of this variable will be on the results of the analysis. It is however possible that large differences can be detected since each industry has to deal with possibly different regulations but also with different economic conditions. Also it is plausible that differences exist between these industries in the operations of the firms that may be reflected in the way that they classify and report their figures in the financial statements.

Important to notice is that the choice was made to exclude the variable $\boldsymbol{BIG4_{it}}$ from the model, which was incorporated in the model of Van de Poel et al. (2008, pp. 21, see Appendix 2). They measured this variable as a dummy variable that was equal to 1 in the case of a Big 4 auditor, and 0 otherwise. They incorporated this variable to test their second hypothesis that indicated that firms who are au-

dited by a Big 4 audit firm, take more goodwill impairments than firms audited by non-Big 4 audit firms, when income-decreasing reporting incentives are low (Van de Poel et al., 2008, pp. 15). The reason why this variable will not be included is as follows. The focus of this research is on Dutch listed firms. Overall it is possible to say that a significantly large portion of these firms is audited by a Big 4 audit firm, even though there may always exist some exceptions. Therefore, including a variable such as $BIG4_{it}$ will not contribute to the research that will be performed and will not influence the results. This is supported by evidence found in the sample, which will be discussed into further detail in the next chapter.

Another reason for not taking into account the variable $BIG4_{it}$ in the model is that the results found by Van de Poel et al. (2008, pp. 23-24) indicated that the coefficient of this variable did not significantly differ from zero (for the pooled sample containing all firm-year observations with goodwill on their balance sheet). This suggested that overall there are no differences in the likelihood of reporting a goodwill impairment across auditors, which was consistent with their expectations. On the one hand they expected Big 4 auditors to force firms to report write-downs in case of impaired goodwill (less type II errors) and, on the other hand, Big 4 auditors were expected to prevent firms from accelerating impairments (in other words taking impairments that are not necessary, type I errors).

A summary of the previous discussion of the variables for the two models is included in Appendix 13.

Noticeable is that no interaction terms have yet been included in the developed models. Interaction terms may be added to the models to incorporate the joint effect of two variables on the dependent variable (the goodwill impairment decision) over and above their separate effects. Interaction terms can be added to the models as cross-products of the standardized independent and/or dummy independent variables, typically placing them after the simple 'main effects' of these independent variables.[10] For this research one interaction term will be incorporated in the models. This interaction term explains the link between a change in the CEO position ($CEO_{it}$) and big bath accounting ($BATH_{it}$ and $BATH2_{it}$) and will therefore be depicted as "$\alpha_{10}*CEO_{it}*BATH_{it}$" ($\alpha_{10}*CEO_{it}*BATH2_{it}$ for Model 2). This interaction term is included since it is expected that a change in CEO can lead to the use of big bath accounting by the new CEO and therefore to more/higher recorded impairment losses. The variable $CEO_{it}$ is important to take into account when examining big bath accounting as a form of earnings management, since a change in CEO can also take place in case of a low performance that cannot be solved by the old CEO. Therefore an interaction term between $BATH_{it}/BATH2_{it}$ and $CEO_{it}$ is included in both models. This interaction term is also necessary since Hypothesis 3 can only be linked to the theory concerning earnings management by incorporating this interaction term. The regression analysis needs to confirm whether or not the variable $CEO_{it}$ has any explanatory power.

[10] www.faculty.chass.ncsu.edu

The choice is made not to include any other interaction terms, since theoretically no relations can be found. Therefore $\alpha_{10}*BATH_{it}*CEO_{it}$ for Model 1 and $\alpha_{10}*BATH2_{it}*CEO_{it}$ for Model 2 are the only interaction terms that are incorporated. This leads to the following two final models that will be tested using regression analysis in the remainder of this research:

***Model 1***

$$\begin{aligned} IMPAIRMENT_{it} = {} & \alpha_0 + \alpha_1 BATH_{it} + \alpha_2 SMOOTH_{it} + \alpha_3 CEO_{it} \\ & + \alpha_4 \Delta SALES_{it} + \alpha_5 \Delta OCF_{it} + \alpha_6 \Delta indROA_{it} \\ & + \alpha_7 GOODWILL_{it-1} + \alpha_8 SIZE_{it} + \alpha_9 INDUSTRY_{it} \\ & + \alpha_{10}*BATH_{it}*CEO_{it} + \varepsilon_{it} \end{aligned}$$

***Model 2***

$$\begin{aligned} IMPAIR\_AMOUNT_{it} = {} & \alpha_0 + \alpha_1 BATH2_{it} + \alpha_2 SMOOTH2_{it} + \alpha_3 CEO_{it} \\ & + \alpha_4 \Delta SALES_{it} + \alpha_5 \Delta OCF_{it} + \alpha_6 \Delta indROA_{it} \\ & + \alpha_7 GOODWILL_{it-1} + \alpha_8 SIZE_{it} + \alpha_9 INDUSTRY_{it} \\ & + \alpha_{10}*BATH2_{it}*CEO_{it} + \varepsilon_{it} \end{aligned}$$

To determine whether the regression coefficients that result from the regression analysis have a significant influence on the impairment decision, a t-test will be applied. Also an F-test will be used to determine the explanatory power of the models. This will be discussed in Chapter 7 where the regression results will be presented.

## 5.4 Research sample and data sources

In this section the sample that will be used in this research will be determined. The focus will be on all Dutch listed companies in the period 2005-2008. This implies that the total initial sample will consist 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[11].

The initial sample needs to be adapted to the research setting by selecting only the companies that are active in the research period. This indicates that the inactive companies are excluded as seen on the firm-year level. This implies that only those firm-years are excluded in which the company was inactive in the sample period, as a consequence of which it is possible that a particular firm will for instance be incorporated only once in the sample. The sample has also been selected based on the information that was available. Since many different variables in the model need to be determined (see section 5.3), it has proven that for some firms in the sample not all necessary information is available. A reason for this is that data from two following years are being used for only one firm-year observation. Also data about the return on assets as well as the cash flows have proven not to be published for

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

all observations. A lack of information is particularly applicable for the year 2008 since a part of the audits for this year are still in progress or still need to be performed. Also there exists a time lag between the completion of an audit and the processing of the data into the databases, which also leads to missing data. Therefore these firms-year observations have also been excluded from the sample.

The next step in selecting the sample consists of excluding those firm-year observations in which there was no goodwill on the opening balance at the same time that no impairment was recorded. These firm-year observations are not related to goodwill or goodwill impairments. Whether a firm has invested in goodwill can be checked first by looking at the opening balance amount of goodwill in the following firm-year and secondly by checking for goodwill impairments in the current year. The latter could imply that although both opening balances do not contain goodwill, this asset has been purchased but has entirely been written off in the same firm-year, which means that an impairment should have been reported in that situation. Therefore these observations have been eliminated, since they cannot be used to answer the hypotheses.
After this process of elimination the final sample consists of 393 firm-year observations. The next chapter will provide descriptive statistics (based on the output of SPSS) concerning the subsamples as will be discussed next.

For this research, the sample will be split up based on industries, as also applied in the research of Lapointe-Antunes et al. (2008) which has already been discussed in the previous section. The industries they use are energy, materials, industrial, consumer discretionary, consumer staples, health care, financials, information technology, telecommunications and utilities. Financial companies and insurance companies as well as real-estate agents will however be excluded from the sample, which leads to the exclusion of the industry group 'Financials' and a final industry distribution over the other nine industry groups as used by Lapointe-Antunes et al. (2008). The choice was however made not to use the exact same industry distribution as was used by them but a similar one, since the industry information from the Industrial Classification Benchmark Industry (ICB), which can be accessed via the Thomson One Banker financial databases, was more appropriate for this sample. The use of the industry distribution of Compustat, as used by Lapointe-Antunes et al. (2008), has proven to be less applicable since all other data was taken from the Thomson One Banker financial databases and this industry distribution was therefore difficult to align with the other information which was gathered. This will however not lead to significantly different results since the distribution is quite similar and this research is specifically developed to test the effect of different variables on the impairment decision. The industry division is only a tool to be able to draw conclusions on a lower level about the applicability of the results of the regression analysis for each industry.

Important to notice is that also a distinction will be made between first-time adopters and early adopters of IFRS to determine the robustness of the results for the total sample. This indicates that additional information needs to be gathered in order to run the regression for the first time with all firm-year observations and for the second time without the early adopters. The reason for this is that early adopters are most likely to have grounded reasons why they want to adopt IFRS early. This means that a firm will not choose to be an early adopter unless it provides benefits to the firm as a whole or to management that decides on this subject. Therefore including those firm-year observations that are related to an early adopter may lead to a distortion of the results when running the regression with all firm-year observations. To control for this effect, the analysis will therefore be performed twice, so one time with the full sample and one time with only the first-time adopters of IFRS.

The information needed to determine whether a firm is a first-time adopter of IFRS is gathered manually from annual reports. The annual reports were gathered from the database Company Info. Also company websites were used to gather annual reports that were not incorporated in this database. The annual reports were also used to determine whether a CEO change has occurred in the period under investigation.

An overview of the collected data to perform this research is provided in a table in Appendix 14. The emphasis is on the names of the data items as found in these databases and the definitions given there. Also a reference is made in the second column of the table to the variables that need to be determined based on these data. The data that were used to justify the choice not to include the variable $BIG4_{it}$ in the models has also been included in the list of data.

### 5.5 Summary and conclusion

This chapter dealt with the design of empirical research on earnings management and goodwill impairments. First the hypotheses were developed based on the empirical studies discussed in Chapter 4. Then the model of Van de Poel et al. (2008) was mentioned as the starting point for developing a new model to test whether earnings management is being applied in practice. This model was then adapted by including and excluding variables based on a discussion of the models that were used in prior studies. These models were depicted in Appendices 2 through 10. The variables were selected based on economical considerations, the effects on the goodwill impairment decision in prior studies and their relevance for this research. Also an emphasis has been given to the way the variables were measured in these different studies since this can have an effect on the results. Then the decision was made to include an interaction term that can explain the relation between a CEO change and the use of big bath accounting by the new CEO.

After developing the model, the sample was selected. As the focus of this research, only Dutch listed companies were selected, which leads to an initial sample size of 1.529 firm-year observations over a time horizon of four years (2005-2008). The final sample consists of 393 firm-year observations, since those firm-year observations were excluded in which companies were inactive and when not all information was available (especially for the year 2008). Also firm-year observations were excluded when there was no goodwill opening balance at the same time that no impairment was recorded. When performing the empirical part of this research, the sample will be divided into multiple industries, as proposed by Lapointe-Antunes et al. (2008). The descriptive statistics for the sample and the different industries will be discussed in the next chapter.

# *Chapter 6: Descriptive statistics and correlation*

## 6.1 Introduction

This chapter deals with the process of running the regression analysis in SPSS. In the next section, first some descriptive statistics are provided. These relate to the sample, specifically to the sample size for the entire sample, as well as the distribution to the different industries. This will be discussed in subsection 6.2.1. The second subsection (6.2.2) will then provide descriptive statistics concerning the variables that have been incorporated in the developed models. Section 6.3 discusses the estimation of the Pearson correlation coefficients. The chapter ends with a short summary and conclusion.

## 6.2 Descriptive statistics

In continuance on the discussion of the sample in section 5.4, the first section of this chapter will provide descriptive statistics regarding the sample as well as the different variables that have been incorporated in the models that will be used to test the hypotheses.

### *6.2.1 Sample*

This section provides descriptive statistics about the compilation of the sample. In Table 1 the descriptive statistics for the final sample are presented. The final sample has been split-up into multiple industries. The first column of the table contains the industry codes as used in the ICB. The second column gives the corresponding name of the industry group. The third column provides the descriptive statistics regarding the number of companies in the total sample and the number of companies that are incorporated in the nine subsamples. Also the number of companies in each subsample that have recognized an impairment loss in a firm-year have been incorporated. The number of companies in each industry as well as the number of companies that have recorded an impairment have also been converted to percentages to give more insight into the distribution to the different industry groups.

Two important matters need to be emphasized here. The first is that, after selecting the final sample, 17 firms (making up 47 firm-year observations in total) had not yet been automatically assigned to the different industry groups. These observations therefore needed to be assigned to an industry before the different variables could be determined. Based on a comparison of the remaining firms with firms that had already been assigned to the industries, the observations were assigned in a similar manner. This led to almost all 47 firm-year observations being assigned to the industry 8000 Financials, since many real-estate agents and investment funds now needed to be classified as ‘financial’ firms.

Another important matter is that the industry 6700 Other is a combination of the original industries 6000 Telecommunications and 7000 Utilities as distinguished by the ICB. Since the initial sample

contained too little observations for both industries, the decision was made to combine these two to be able to draw stronger conclusions based on these firm-year observations. However, as can be seen in Table 1, this combined industry group is still quite small compared to the other industries. Therefore it is necessary to act with caution when analyzing the results for this industry compared to others, since the results will be less reliable for this industry.

**Table 1 Descriptive statistics – Goodwill impairment losses by industry**

| ***Industry group*** | | ***Number of firm-year observations*** | | | |
|---|---|---|---|---|---|
| | | *Total* | *% of total* | *Impairment* | *% of total* |
| 0001 | Oil and Gas | 17 | 4.33% | 5 | 29.41% |
| 1000 | Basic materials | 11 | 2.80% | 5 | 45.45% |
| 2000 | Industrials | 134 | 34.10% | 29 | 21.64% |
| 3000 | Consumer goods | 55 | 13.99% | 12 | 21.82% |
| 4000 | Health care | 23 | 5.85% | 1 | 4.35% |
| 5000 | Consumer services | 63 | 16.03% | 13 | 20.63% |
| 6700 | Other | 7 | 1.78% | 3 | 42.86% |
| 8000 | Financials | 26 | 6.62% | 3 | 11.54% |
| 9000 | Technology | 57 | 14.50% | 11 | 19.30% |
| | *Total* | *393* | *100.00%* | *82* | *20.87%* |

Table 1 shows that the industry 2000 Industrials makes up the largest portion of the total sample for this research, namely 34.10%. All other industries make up much smaller parts of the sample. This indicates that the results of this research will be more representable for this subsample than for other industries, since these contain a smaller number of firm-year observations. However, when examining the percentage of impairments that have been reported for all observations, there is a better spread when comparing the industries. The industries 1000 Basic Materials, 6700 Other and to a lesser extent 0001 Oil and Gas, 2000 Industrials and 3000 Consumer Goods have a relatively higher frequency of reported impairments, since they record on average more impairment losses (percentage of impairments of the total for these industries is above the average of 20.87% for the total sample). However, for 6700 Other the results are less reliable since this is a relatively small sample. For the industry 4000 Health care the results are different, since in this industry a relatively lower frequency of reported impairments is found. This indicates that in this industry firms report less impairments than in other industries. A possible reason for this can be that the performance in this industry is less volatile than in other industries, implying that the value of the purchased goodwill at the time of an acquisition stays relatively stabile. The opposite can be found for 1000 Basic Materials, meaning that a relatively high amount of impairments is reported. Even though this subsample is also relatively small, it can be argued that the industry conditions here can lead to relatively fast declines in the value of goodwill.

Noticeable is, as discussed before, that the industry that incorporates financial and insurance companies, as well as real-estate agents, will be excluded from this research since the companies that fall into this category deal with very different laws and regulations than all other firms and this makes the results difficult to compare. Therefore the industry group 8000 Financials will not be included in the remainder of this research. This leads to the definitive version of the industry distribution as depicted in Table 2.

The results as presented in this table indicate that the distribution of the remaining firm-year observations in the final sample has changed. The industry 2000 Industrials now makes up 36.51% of the total sample, indicating that the percentage has increased slightly. Concerning the percentage of impairments that are reported compared to the total number of observations in each industry, no changes have occurred. Also no changes have occurred in which industries report, relatively speaking, an above-average number of impairments, since the industries 0001 Oil and Gas, 1000 Basic Materials, 2000 Industrials, 3000 Consumer Goods and 6700 Other still contain relatively more observations of firms that have recorded an impairment loss than the average for all eight remaining industries after excluding the industry 8000 Financials. Therefore the conclusion can be drawn that excluding this industry has led to a slight increase of the percentage that each industries makes up of the total sample and not to changes in industries that report a relative above-average number of recorded impairments.

**Table 2: Descriptive statistics – 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%*[12] | *79* | *21.53%* |

A final point of attention in the discussion of the sample is associated with the variables that have been chosen to include in the model. In section 5.4 the variable $BIG4_{it}$ has been discussed in the development of the model. The choice was made not to incorporate this variable since a significantly large portion of the sample was expected to have a BIG 4 auditor. This has been supported by evidence

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

found when collecting information for the sample in the Thomson One Banker financial databases and has been depicted in the following table.

**Table 3: Descriptive statistics – Number of firm-year observations with a BIG 4 auditor**

| ***Description*** | *Firm-years (incl. financials)* | *% of total (incl. financials)* | *Firm-years (final sample)* | *% of total (final sample)* |
|---|---|---|---|---|
| Big 4 auditor | 332 | 84.48% | 306 | 83.38% |
| No Big 4 auditor | 35 | 8.91% | 35 | 9.54% |
| Unknown | 26 | 6.62% | 26 | 7.08% |
| *Total* | *393* | *100.01%* | *367* | *100.00%* |

Overall, 84.48% of the firm-year observations in the total sample of 393 firm-year observations have financial statements that have been audited by a BIG 4 auditor. This sample includes the financials that will not be included in the final sample for this research. When looking at the final sample that excludes these financials, this leads to a percentage of 83.38% of the total firm-year observations that have financial statements that are audited by a BIG 4 auditor. Since both percentages represent a significantly large portion of the total sample, the conclusion can be drawn that not including the variable $BIG4_{it}$ in the models for this research is justified based on these results.

### *6.2.2 Variables*

This section provides descriptive statistics for the variables that have been incorporated in the models that will be used to test the hypotheses.

In the next three tables, descriptive statistics for all variables that are incorporated in either Model 1 or Model 2 of this research are displayed. The tables show the minimum and maximum values that each variable can take, as well as the mean and the standard deviation. The first table, Table 4, provides the descriptive statistics for the total sample. Table 5 focuses only on those firm-year observations in which an impairment loss was reported and Table 6 focuses on those where no impairment loss was reported.

Table 4 shows the descriptive statistics for the total sample under investigation. Important to notice for the interpretation of the presented results is that in total 55 (56 including the outlier, see footnote 13) firm-year observations provide conditions for big bath accounting, since then the variable $BATH_{it}$ (Model 1) has the value of 1. When examining the descriptive statistics for this variable, this confirms that in a quite small number of cases a condition is found for big bath accounting. Also for 99 firm-year observations conditions are found for income smoothing, since then the variable $SMOOTH_{it}$ has the value of 1. Again, the descriptive statistics confirm this. When examining these variables for Model 2 ($BATH2_{it}$ and $SMOOTH2_{it}$), it can be concluded that on average, the observations that fall under

these variables do not have very large values, since for both variables the means are close to zero. This indicates that there are indeed conditions present for the use of big bath accounting and income smoothing, but that on average these conditions will not provide strong incentives.
In addition, for the variable $CEO_{it}$ a total of 94 firm-year observations show a CEO change in year t or t-1. According to the descriptive statistics this is the case in 26% of all observations (value is 0.26).
Based on Table 4, the conclusion can also be drawn that on average the industry ROA has decreased (negative mean) in the period under investigation and that sales and cash flows have increased (positive means).

**Table 4: Descriptive statistics total sample (n=366) – Variables Model 1 and Model 2**

| | *Minimum* | *Maximum* | *Mean* | *Std. Deviation* |
|---|---|---|---|---|
| ***Dependent variables*** | | | | |
| IMPAIRMENTit | 0 | 1 | 0.21 | 0.410 |
| IMPAIR_AMOUNTit | 0 | 0.4784[13] | 0.0053 | 0.0381 |
| ***Independent variables*** | | | | |
| ΔindROAit | -23.2862 | 7.4046 | -1.0243 | 3.6450 |
| ΔSALESit | -2.2184 | 2.7218 | 0.1533 | 0.3715 |
| ΔOCFit | -1.125 | 0.5200 | 0.0078 | 0.1276 |
| BATHit | 0 | 1 | 0.15 | 0.358 |
| SMOOTHit | 0 | 1 | 0.27 | 0.445 |
| BATH2it | -1.1586 | 0 | -0.0284 | 0.0917 |
| SMOOTH2it | 0 | 0.5317 | 0.0389 | 0.0734 |
| CEOit | 0 | 1 | 0.26 | 0.437 |
| GOODWILLit | 0.0003 | 0.6914 | 0.1508 | 0.1417 |
| SIZEit | 0.5446 | 12.2076 | 6.4068 | 2.119 |

Since Table 4 includes firm-year observations with and without reported impairments, it is possible that these descriptive statistics are influenced by combining these different observations. Therefore also descriptive statistics including only the impairment sample and only the non-impairment sample have been depicted in the following tables.

Of the impairment sample (as depicted in Table 5) 12 observations include conditions for big bath accounting, while for the non-impairment sample 43 observations include conditions for big bath accounting. This implies that only in a small number of cases it is possible to use impairments as a tool for applying big bath accounting, since only 12 conditions for big bath accounting are found simultaneously with the recognition of an impairment loss. Of the impairment sample 20 observations include conditions for income smoothing, while for the non-impairment sample 79 observations include such conditions. This implies that impairments can only be used as a tool for income smoothing in a small

[13] One observation has been excluded from the sample from this point on because it concerns an outlier with regard to the variable $IMPAIR\_AMOUNT_{it}$ (the value for this observation is 1.4517 which is significantly larger than the values for all other observations in the sample).

number of cases. When examining the CEO changes, again the most CEO changes (72) are found for the non-impairment sample instead of with the impairment sample (only 22).

These results are therefore not in accordance with expectations, since it was expected that the reporting incentives big bath accounting and income smoothing and a change in the CEO position are highly associated with recording impairments. A possible explanation for this can be that the incentives to use these types of earnings management are not strong enough for management to actually use them by reporting an impairment loss, since the economic conditions cannot be classified as abnormal or extreme. Perhaps these incentives only play a role in combination with goodwill impairment under extreme circumstances, since then the opportunities to manage earnings will be greater. Whether this is the case will be more clear when analyzing the regression coefficients in Chapter 7.

**Table 5: Descriptive statistics impairment sample (n=78) – Variables Model 1 and Model 2**

| | *Minimum* | *Maximum* | *Mean* | *Std. Deviation* |
|---|---|---|---|---|
| ***Dependent variables*** | | | | |
| IMPAIRMENTit | 1 | 1 | 1 | 0 |
| IMPAIR_AMOUNTit | 8.2345E-6 | 0.4784 | 0.0248 | 0.0799 |
| ***Independent variables*** | | | | |
| ΔindROAit | -13.0640 | 7.4046 | -0.6621 | 2.9820 |
| ΔSALESit | -0.9333 | 1.6486 | 0.1554 | 0.3037 |
| ΔOCFit | -1.125 | 0.305 | -0.0089 | 0.1633 |
| BATHit | 0 | 1 | 0.15 | 0.363 |
| SMOOTHit | 0 | 1 | 0.26 | 0.439 |
| BATH2it | -1.1586 | 0 | -0.0402 | 0.1425 |
| SMOOTH2it | 0 | 0.2649 | 0.0282 | 0.0436 |
| CEOit | 0 | 1 | 0.28 | 0.453 |
| GOODWILLit | 0.0033 | 0.6786 | 0.1632 | 0.1435 |
| SIZEit | 1.1029 | 12.1202 | 7.5844 | 2.3188 |

**Table 6: Descriptive statistics non-impairment sample (n=288) – Variables Model 1 and Model 2**

| | *Minimum* | *Maximum* | *Mean* | *Std. Deviation* |
|---|---|---|---|---|
| ***Dependent variables*** | | | | |
| IMPAIRMENTit | 0 | 0 | 0 | 0 |
| IMPAIR_AMOUNTit | 0 | 0 | 0 | 0 |
| ***Independent variables*** | | | | |
| ΔindROAit | -23.2862 | 7.4046 | -1.1224 | 3.8034 |
| ΔSALESit | -2.2184 | 2.7218 | 0.1527 | 0.3882 |
| ΔOCFit | -0.753 | 0.520 | 0.0124 | 0.1160 |
| BATHit | 0 | 1 | 0.15 | 0.357 |
| SMOOTHit | 0 | 1 | 0.27 | 0.447 |
| BATH2it | -0.6107 | 0 | -0.0252 | 0.0721 |
| SMOOTH2it | 0 | 0.5317 | 0.0419 | 0.0793 |
| CEOit | 0 | 1 | 0.25 | 0.434 |
| GOODWILLit | 0.0003 | 0.6914 | 0.1474 | 0.1412 |
| SIZEit | 0.5446 | 12.2076 | 6.0878 | 1.9471 |

When comparing the results in Table 5 and 6, it can be concluded that for the impairment sample the mean change in operating cash flows is negative and positive for the sample where no impairment was reported. This is consistent with the expectations as formulated in section 5.3.2. This variable would be negative in the case that the firm experienced lower (negative) economic performance and positive when the firm experienced higher (positive) economic performance or growth. The descriptive statistics presented here confirm this, since the mean of the variable $\Delta OCF_{it}$ is negative for the impairment sample, indicating that the lower or negative performance can be associated with the reporting of an impairment loss.

The mean value for the variable $\Delta SALES_{it}$ shows a positive sign for the impairment and non-impairment sample in both tables. This indicates that overall a positive change has taken place in sales. The mean value for $\Delta SALES_{it}$ is however slightly higher for the sample of observations reporting an impairment loss than for the non-impairment sample. This higher value implies that higher sales can be associated with impairments, which points in the direction of income smoothing since a higher performance (sales) in that case is associated with higher or more impairment losses being recognized.
In accordance with expectations, Table 5 and 6 also show that the mean value of the variable $\Delta indROA_{it}$ is negative for both the impairment and non-impairment sample. The mean value for this variable is however higher for the non-impairment sample than for the impairment sample. This can be explained as follows. A lower industry performance that occurs suddenly can have the effect that management has no incentive to report an impairment, since the lower performance may be expected not to continue for a long time. Based on this expectation it may not be necessary to report an impairment loss. Not reporting an impairment loss under such circumstances therefore implies that the mean value of the variable $\Delta indROA_{it}$ is highest for the non-impairment sample, since then the changes may be more extreme. A low performance represented by this variable that already exists some time and does not change much (magnitude is smaller) can therefore provide a stronger incentive to report an impairment loss than sudden (negative) changes in performance.

With regard to the reporting incentives, the mean values of the variables $BATH_{it}$ and $BATH2_{it}$ are slightly higher for the impairment sample than for the non-impairment sample. This is according to expectations, since the reporting of an impairment loss was associated with big bath accounting.
For the variables $SMOOTH_{it}$ and $SMOOTH2_{it}$ the mean values are slightly higher for the non-impairment sample than for the impairment sample. This can be explained as follows. When impairments need to be accounted for, this diminishes the reported earnings of the firm. However, when a firm wants to present a consecutive line of earnings, this could provide the incentive not to report an impairment loss when earnings do not differ substantially enough from the formulated expectations about the earnings development. Therefore earnings are smoothed by choosing not to record an impairment loss. The values for these variables can therefore be higher for the non-impairment sample

than for the impairment sample. This result implies that impairments are only used by management in the case of extreme circumstances, so when earnings deviate substantially from expectations.
The final reporting incentive that will be discussed here is the variable $CEO_{it}$. The mean value of this variable is higher for the impairment sample than for the non-impairment sample. This indicates that CEO changes occur more often in the same year that an impairment loss is being reported than in a year where no impairment was reported. This is according to expectations, since a change in the CEO position was seen in relation to the reporting of an impairment loss in the first or second year the new CEO holds office.

### 6.3 Correlation

This section presents the Pearson correlation coefficients that are determined to show the association that exists between the different variables. When a strong association between two variables is present, this can imply that multicollinearity exists. Table 7 and 8 present the (adjusted) correlation matrices that SPSS produces for Model 1 and 2. Important to notice is that SPSS produces a correlation matrix in which each correlation appears twice, as the upper-right triangle is a mirror image of the lower-left triangle (Kirkpatrick and Feeny, 2007, pp. 78-79). Since this makes the correlation matrix unclear, these double correlation figures have been eliminated from the matrix. As can be derived from Table 7 and 8, no indications for multicollinearity are found since correlation is overall quite low. This implies that no additional tests for multicollinearity need to be performed and that the models can be used in the way they were developed to investigate the influence of the factors on the impairment decision.

Based on the depicted tables it is also possible to conclude that the number of correlations between the variables that are significant differs substantially between the two models, indicating that the models do not lead to similar results concerning the Pearson correlation coefficients. One difference that can be found is that for Model 2 there is a significant correlation at the 1% level of $IMPAIR\_AMOUNT_{it}$ with $\Delta OCF_{it}$, $BATH2_{it}$ and $GOODWILL_{it}$ and a significant correlation at the 5% level of this variable with $\Delta SALES_{it}$ and $CEO_{it}$ that were not present for Model 1. Also the variable $SIZE_{it}$ is significantly correlated with the dependent variable for Model 2 at the 5% level, while this correlation holds at the 1% for Model 1. Another difference is that for Model 1 a significant correlation at the 1% level exists between the variables $SMOOTH_{it}$ and $\Delta SALES_{it}$ and that this relation cannot be found for Model 2. The last difference is that for Model 2 an additional significant correlation at the 5% level is found between the variables $GOODWILL_{it}$ and $BATH2_{it}$, which is not present for Model 1. All other correlations that are significant (at the same level) are the same for both models.

## Table 7: Correlation matrix Model 1

| | | IMPAIRMENTit | ΔindROAit | ΔSALESit | ΔOCFit | BATHit | SMOOTHit | CEOit | GOODWILLit |
|---|---|---|---|---|---|---|---|---|---|
| ΔindROAit | Pearson Correlation | 0.052 | | | | | | | |
| | Sig. (2-tailed) | 0.323 | | | | | | | |
| ΔSALESit | Pearson Correlation | 0.003 | 0.090* | | | | | | |
| | Sig. (2-tailed) | 0.954 | 0.087 | | | | | | |
| ΔOCFit | Pearson Correlation | -0.068 | 0.020 | 0.132** | | | | | |
| | Sig. (2-tailed) | 0.192 | 0.699 | 0.011 | | | | | |
| BATHit | Pearson Correlation | 0.005 | 0.042 | -0.069 | -0.499*** | | | | |
| | Sig. (2-tailed) | 0.921 | 0.427 | 0.185 | 0.000 | | | | |
| SMOOTHit | Pearson Correlation | -0.016 | -0.064 | 0.151*** | 0.431*** | -0.256*** | | | |
| | Sig. (2-tailed) | 0.753 | 0.224 | 0.004 | 0.000 | 0.000 | | | |
| CEOit | Pearson Correlation | 0.030 | -0.007 | 0.031 | -0.047 | 0.015 | 0.050 | | |
| | Sig. (2-tailed) | 0.567 | 0.888 | 0.559 | 0.367 | 0.770 | 0.337 | | |
| GOODWILLit | Pearson Correlation | 0.046 | -0.030 | 0.146*** | -0.080 | 0.042 | -0.072 | 0.026 | |
| | Sig. (2-tailed) | 0.384 | 0.567 | 0.005 | 0.126 | 0.428 | 0.167 | 0.617 | |
| SIZEit | Pearson Correlation | 0.290*** | 0.042 | -0.161*** | 0.074 | -0.167*** | -0.215*** | 0.021 | 0.038 |
| | Sig. (2-tailed) | 0.000 | 0.422 | 0.002 | 0.160 | 0.001 | 0.000 | 0.686 | 0.464 |

***, **, * Correlation is significant at respectively the α = 0.01, 0.05 and 0.10 level (2-tailed)

## Table 8: Correlation matrix Model 2

| | | IMPAIR_AMOUNTit | ΔindROAit | ΔSALESit | ΔOCFit | BATH2it | SMOOTH2it | CEOit | GOODWILLit |
|---|---|---|---|---|---|---|---|---|---|
| ΔindROAit | Pearson Correlation | 0.021 | | | | | | | |
| | Sig. (2-tailed) | 0.684 | | | | | | | |
| ΔSALESit | Pearson Correlation | 0.104** | 0.090* | | | | | | |
| | Sig. (2-tailed) | 0.048 | 0.087 | | | | | | |
| ΔOCFit | Pearson Correlation | -0.349*** | 0.020 | 0.132** | | | | | |
| | Sig. (2-tailed) | 0.000 | 0.699 | 0.011 | | | | | |
| BATH2it | Pearson Correlation | -0.580*** | 0.040 | 0.075 | 0.793*** | | | | |
| | Sig. (2-tailed) | 0.000 | 0.446 | 0.155 | 0.000 | | | | |
| SMOOTH2it | Pearson Correlation | -0.037 | 0.008 | 0.075 | 0.614*** | 0.165*** | | | |
| | Sig. (2-tailed) | 0.476 | 0.880 | 0.154 | 0.000 | 0.002 | | | |
| CEOit | Pearson Correlation | 0.111** | -0.007 | 0.031 | -0.047 | -0.080 | 0.054 | | |
| | Sig. (2-tailed) | 0.034 | 0.888 | 0.559 | 0.367 | 0.125 | 0.306 | | |
| GOODWILLit | Pearson Correlation | 0.217*** | -0.030 | 0.146*** | -0.080 | -0.103** | -0.017 | 0.026 | |
| | Sig. (2-tailed) | 0.000 | 0.567 | 0.005 | 0.126 | 0.049 | 0.740 | 0.617 | |
| SIZEit | Pearson Correlation | -0.123** | 0.042 | -0.161*** | 0.074 | 0.269*** | -0.290*** | 0.021 | 0.038 |
| | Sig. (2-tailed) | 0.019 | 0.422 | 0.002 | 0.160 | 0.000 | 0.000 | 0.686 | 0.464 |

***, **, * Correlation is significant at respectively the α = 0.01, 0.05 and 0.10 level (2-tailed)

## 6.4 Summary and conclusion

This chapter discussed the descriptive statistics for the sample as well as for the dependent and independent variables of the two models. For the sample the conclusion was drawn that the total sample consists of 367 firm-year observations (=including one outlier) divided over eight industries. The largest industry is 2000 Industrials, making up 36.51% of the total. The industries 0001 Oil and Gas, 1000 Basic Materials, 2000 Industrials, 3000 Consumer Goods and 6700 Other are the industries that report more impairments than on average for the total sample.

Concerning the descriptive statistics for the variables of Model 1 for the total sample the conclusion was drawn that in quite a small number of cases a condition is found for big bath accounting. Also for income smoothing less conditions are found than expected, but at least more than for big bath accounting. For Model 2 the conditions for big bath accounting and income smoothing are on average weak, since they do not differ much from zero.

When dividing the sample into an impairment and non-impairment sample, the conclusion was drawn that only in a small number of cases it is possible to use impairments as a tool for earnings management by applying big bath accounting or income smoothing. For CEO changes the same reasoning was applied, since only a small number of CEO changes were incorporated in the impairment sample.

Furthermore, the mean values of the proxies for big bath accounting ($BATH_{it}$ and $BATH2_{it}$) were higher for the impairment sample, indicating that the conditions for earnings management through big bath accounting are more present for the observations in which indeed an impairment loss was recognized. For the proxies for income smoothing, the mean values were higher for the non-impairment sample indicating that the conditions may not have been extreme or abnormal enough to make them appropriate to apply this reporting strategy. The mean values for the variable $CEO_{it}$ were higher for the impairment sample indicating that on average a CEO change occurs more often in the year an impairment is reported than when an impairment is not reported.

Finally, correlation matrices were presented in this chapter that indicated that no additional tests for multicollinearity needed to be performed since overall correlation was quite low. However, remarkable is that the correlation results differed substantially for the two models.

# *Chapter 7: Results and analysis*

## 7.1 Introduction

This chapter presents the regression results when applying the models that were developed in the previous section to test the hypotheses developed in section 5.2. The next section will first discuss some important general remarks about the use of regression analysis for this research. After that, section 7.3 will present the regression results for both models in separate subsections as well as a comparison between these results. After this comparison, the results of multiple control samples will also be presented in section 7.4 to determine whether the main results are robust after alternative tests. This is done by excluding early adopters of IFRS from the sample, but also by dividing the sample into different periods to determine whether observations from a certain period cause distortions in the results. These subsections will also include an analysis of the presented results. The chapter is closed with a summary and conclusion. Noticeable is that Appendix 15 provides an example of how the models have been applied to generate the results, since no elaboration on this will be incorporated in this chapter. The calculations for the variables are provided here as how they are incorporated in the formulas.

## 7.2 General remarks concerning regression analysis

Important to notice before applying the models is that for running multiple regression analysis there exist two additional options in SPSS. The first option is to use step-wise selection methods (Kirkpatrick and Feeney, 2007, pp. 88). With this method the regression analysis is run multiple times, only every time another variable is either included or excluded. This method is not used very often and will not provide added value to this research. Therefore, the step-wise selection method will not be applied in this research.

The second option is that the 'full' model that incorporates all the predictors is tested against a reduced model that incorporates a reduced number of variables (Kirkpatrick and Feeney, 2007, pp. 88-90). This comparison will then test whether for instance two variables collectively predict additional variance in the dependent variable above and beyond what can be predicted by only one of these two variables. In SPSS this is called a models comparison. This function therefore makes it possible to compare the explanatory power of the different models.

Since Van de Poel et al. (2008) also used a method that is similar to the method discussed last, models comparison (even though it was not specifically labelled as such), this method will also be selected for this research since it will provide a better basis for comparing the results for the different variables in their model and in the models that are being used to test the hypotheses in this research. Also models comparison seems to present more useful information than the step-wise selection method and therefore models comparison is the superior method of these two. Another reason why this option will be

used is that it provides the possibility to compare the explanatory power of the two models as well as the explanatory power of the different variables that have been incorporated. Therefore the use of this method adds value to the strength of the analysis of the presented results in this research.

## 7.3 Regression results and analysis

The regression analysis that is performed is divided into two steps. First the regression results for the total sample will be presented for Model 1 in subsection 7.3.1 and for Model 2 in subsection 7.3.2. Then a comparison between the results of these two models will be discussed in subsection 7.3.3 to determine whether any differences can be discovered.

### *7.3.1 Regression results Model 1*

This section presents the results of the regression analysis for Model 1 when applied to the total sample. Simultaneously with the presentation of the results, an analysis will be performed by comparing the results to the expectations as formulated in Chapter 5. Also a comparison with the results in prior research is incorporated here.

As can be derived from Table 9, five different versions of Model 1 have been used in the regression analysis to determine whether any significant changes occur when a variable is left out of the model. Version I is the full model as developed in Chapter 5. The versions II, III and IV each exclude different variables, more specifically the variables that were incorporated to test the hypotheses, in order 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 1-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 version 1-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 1-IV excludes the variable $SMOOTH_{it}$. Version 1-V is the last version that is applied and is composed of the full model (version 1-I), but then including also the interaction term between big bath accounting and a CEO change, since this is a factor that is added to the model instead of removed like was done for the previous versions.

From Table 9 the conclusion can be drawn that the explanatory power of the model (Adjusted R-square)[14] 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

[14] R-square ($=r^2$) is a measure of how succesful the regression is in explaining the response. (Moore et al., 2003, pp. 118)

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.

**Table 9: Regression results Model 1 – Model summary (total sample)**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| I | ,329[a] | ,108 | ,088 | ,392 | ,108 | 5,402 | 8 | 357 | ,000 |
| II | ,328[b] | ,108 | ,090 | ,391 | ,000 | ,028 | 1 | 357 | ,868 |
| III | ,328[c] | ,108 | ,093 | ,391 | ,000 | ,159 | 1 | 358 | ,690 |
| IV | ,312[d] | ,098 | ,085 | ,392 | -,010 | 3,986 | 1 | 359 | ,047 |
| V | ,329[e] | ,108 | ,085 | ,392 | ,010 | 1,036 | 4 | 356 | ,388 |

a. Predictors: (Constant), LN(assets), CEOit, indROAit, GW/Total Assets t-1, OCFit, SALESit, SMOOTHit, BATHit

b. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit, SMOOTHit, BATHit

c. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit, SMOOTHit

d. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit

e. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit, CEOit, SMOOTHit, BATHit, BATH_CEO

In addition, Table 10 shows that the regression part of the Sum of Squares is particularly low, confirming the low explanatory power as already discussed before with Table 9. These tables therefore show 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 10: Regression results Model 1 – ANOVA (total sample)**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| I | Regression | 6,627 | 8 | ,828 | 5,402 | ,000 |
| | Residual | 54,750 | 357 | ,153 | | |
| | Total | 61,377 | 365 | | | |
| II | Regression | 6,623 | 7 | ,946 | 6,186 | ,000 |
| | Residual | 54,754 | 358 | ,153 | | |
| | Total | 61,377 | 365 | | | |
| III | Regression | 6,599 | 6 | 1,100 | 7,208 | ,000 |
| | Residual | 54,778 | 359 | ,153 | | |
| | Total | 61,377 | 365 | | | |
| IV | Regression | 5,991 | 5 | 1,198 | 7,788 | ,000 |
| | Residual | 55,386 | 360 | ,154 | | |
| | Total | 61,377 | 365 | | | |
| V | Regression | 6,626 | 9 | ,736 | 4,789 | ,000 |
| | Residual | 54,749 | 356 | ,154 | | |
| | Total | 61,377 | 365 | | | |

Table 11 shows that the economic factor $\Delta OCF_{it}$, 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 $\Delta OCF_{it}$ for versions IV and V is somewhat different (1% and 10% respectively instead of 5%), but the factor still has a significant influence.

When examining the effects of these factors on the impairment decision into more detail, the conclusion can be drawn that the sign for the variable $\Delta OCF_{it}$ is negative, indicating that the recognized impairment loss will be higher when the firm is performing poor. Therefore the result for this variable is as expected. Also this result is in accordance with the results of Van de Poel et al. (2008).

The sign of the variable $SIZE_{it}$ is also consistent with expectations. The expectation was that this variable would have a positive effect on the impairment decision, indicating that a larger firm will be more likely to report an impairment loss than a smaller firm. This result is also consistent with the research of Van de Poel et al. (2008).

According to Table 11, the reporting incentive $SMOOTH_{it}$ also has a positive significant influence on the impairment decision, which again 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.

**Table 11: Regression results Model 1 – Regression coefficients (total sample)**

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

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

One variable that does not prove to have as 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 that 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.

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 in times 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 in not 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, indicating that it is in the best interest of the CEO not to report an impairment loss.

Other variables that have been included in the model to control for the economic conditions with which the firms need to deal as well as control variables have not proven to have a significant effect on the impairment decision. This contradicts with expectations as well as with results from prior research (Van de Poel et al, 2008). Since these variables are not associated with the hypotheses, these results will not be discussed here into further detail.

### *7.3.2 Regression results Model 2*

This section will discuss the regression results when applying Model 2 for the total sample as was also done in the previous section for Model 1.

Table 12 provides a model summary for this regression. The Adjusted R-square for this model is at a maximum of 0.566 for version V of Model 2 (2-V). The explanatory power of this model is therefore quite high. Noticeable is that this concerns the full model that incorporates all variables as well as the interaction term, which indicates that together these variables can best predict the impairment decision.

**Table 12: Regression results Model 2 – Model summary (total sample)**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| I | ,658[a] | ,433 | ,420 | 2,9062033… | ,433 | 33,917 | 8 | 356 | ,000 |
| II | ,655[b] | ,429 | ,418 | 2,9116588… | -,004 | 2,342 | 1 | 356 | ,127 |
| III | ,471[c] | ,221 | ,208 | 3,3945534… | -,207 | 129,595 | 1 | 357 | ,000 |
| IV | ,425[d] | ,181 | ,170 | 3,4768696… | -,040 | 18,622 | 1 | 358 | ,000 |
| V | ,760[e] | ,577 | ,566 | 2,5122146… | ,396 | 83,159 | 4 | 355 | ,000 |

a. Predictors: (Constant), LN(assets), CEOit, indROAit, GW/Total Assets t-1, OCFit, SALESit, SMOOTH2it, BATH2it

b. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit, SMOOTH2it, BATH2it

c. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit, SMOOTH2it

d. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit

e. Predictors: (Constant), LN(assets), indROAit, GW/Total Assets t-1, OCFit, SALESit, CEOit, BATH2_CEO, SMOOTH2it, BATH2it

Table 13 provides compelling evidence based on which the conclusion can be drawn that 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 as already discussed with Table 12.

**Table 13: Regression results Model 2 – ANOVA (total sample)**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| I | Regression | ,229 | 8 | ,029 | 33,917 | ,000 |
| | Residual | ,301 | 356 | ,001 | | |
| | Total | ,530 | 364 | | | |
| II | Regression | ,227 | 7 | ,032 | 38,284 | ,000 |
| | Residual | ,303 | 357 | ,001 | | |
| | Total | ,530 | 364 | | | |
| III | Regression | ,117 | 6 | ,020 | 16,970 | ,000 |
| | Residual | ,413 | 358 | ,001 | | |
| | Total | ,530 | 364 | | | |
| IV | Regression | ,096 | 5 | ,019 | 15,861 | ,000 |
| | Residual | ,434 | 359 | ,001 | | |
| | Total | ,530 | 364 | | | |
| V | Regression | ,306 | 9 | ,034 | 53,837 | ,000 |
| | Residual | ,224 | 355 | ,001 | | |
| | Total | ,530 | 364 | | | |

The estimates of the regression coefficients for Model 2 are depicted in Table 14. The results show that the economic factors $\Delta SALES_{it}$ and $\Delta OCF_{it}$, 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 that 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).

When examining these factors into more detail, the sign of the variable $\Delta SALES_{it}$ seems to be positive, indicating that a low performance by the firm causes the reporting of a lower impairment loss. The sign of this variable is in contrast to the sign for this variable as found in the research of Van de Poel et al. (2008) and also contradicts expectations. A possible reason for the different results can be that there were no performances that were extremely high or low. This can lead to a weaker reaction to the achieved performance. Also it is possible that a slightly lower performance can then lead to not reporting an impairment loss since, relatively speaking, the negative change in performance is not substantial enough to influence the impairment decision, indicating that the incentive is not very strong. Therefore the sign now has the opposite direction as expected.

**Table 14: Regression results Model 2 – Regression coefficients (total sample)**

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

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

Also the economic factor $\Delta OCF_{it}$ seems to have a significant positive influence on the impairment decision for model versions I, II and V, but a negative significant influence for model version III and IV. The positive sign of this variable in the case of model versions I, II and V therefore differs from expectations and prior research by Van de Poel et al. (2008) since a lower performance was associated with higher recorded impairment losses, indicating a negative relation. This different result can be explained as follows. The impairment decision is fundamentally based on an impairment calculation.

In this calculation amongst others the expected cash flows of the firm for a number of years in the future need to be estimated, but also the cost of capital and numerous other factors need to be taken into account. When the cash flows of the firm then decrease, but other factors also change as a consequence of a change in economic conditions (of which the operating cash flows are a measure), for instance a decrease in the cost of capital, the conclusion of the impairment calculation can still remain the same. In that case no impairment loss needs to be recognized. Therefore it is possible that in the case of lower performance no impairment loss is being recognized.

The positive sign of the control variable $GOODWILL_{it}$ is as expected and is consistent with prior research (Van de Poel et al., 2008). Important is therefore that this result confirms that indeed a larger opening balance of goodwill positively influences the impairment decision, implying that higher or more impairments are being recognized when the goodwill opening balance is higher.

For this model the variable $BATH2_{it}$ also has a significant influence, in this case 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 then 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 is contrary to the expectations for this research. This can be explained by the reasoning that the 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 im-

pairment 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 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 that is not in support of Hypothesis 2. Therefore this hypothesis should be rejected.

The final significant effect to discuss is the interaction term $BATH2_{it}$*$CEO_{it}$. The sign of this variable here is negative. This 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 $BATH2_{it}$ has proven to be 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.
The fact that this interaction term is significant and has a negative sign indicates that a CEO change is not associated with big bath accounting but more with loss minimalisation as explained earlier. 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. Based on this result the conclusion can be drawn that evidence is found that contradicts with Hypothesis 3, indicating that firms that experience a change in CEO record higher goodwill impairment losses. Therefore this hypothesis should be rejected.

### *7.3.3 Comparison between models*

Based on the regression results as presented in the previous two subsections, the conclusion needs to be drawn that the results of the two models differ substantially in numerous ways. This is a remarkable and important finding since Van de Poel (2008) had made a statement that the use of a model with a dummy variable as the independent variable to measure the impairment decision does not lead to different results compared to the situation in which the amounts of the goodwill impairments (deflated by total assets) are filled in. This research therefore provides compelling evidence that this statement of Van de Poel (2008) is incorrect when applied to this research. The following more in-depth discussion of the results will make this more clear.

When examining the results for the total sample (2005-2008), the explanatory power differs substantially between the two models. For Model 1-III the explanatory power (Adjusted R-square) is at a maximum of 0.093, while the explanatory power is at a maximum of 0.566 for Model 2-V. This indicates that Model 1 does not predict the impairment decision accurately, while Model 2 predicts the impairment decision much more accurate. This contradicts with expectations since it was expected that both models would have approximately the same explanatory power, based on the research of Van de Poel et al. (2008).

The differences between the factors that prove to have a significant influence on the impairment decision are also substantial. For Model 1 only the effects of the variables $\Delta OCF_{it}$ and $SIZE_{it}$ are significant, while for Model 2 the variables $\Delta SALES_{it}$, $\Delta OCF_{it}$, $BATH2_{it}$, $SMOOTH2_{it}$, $GOODWILL_{it}$ and the interaction term $BATH2_{it}*CEO_{it}$ have a significant influence. For all versions of Model 2 these variables are all significant at the 1% level, except for $\Delta SALES_{it}$ when applying version III. In that case the applicable significance level is 5%. These results therefore indicate that the only variable that is significant when applying both models is the variable $\Delta OCF_{it}$. However, the applicable significance level is 1% for all versions of Model 2, while the significance level differs between 1%, 5% and 10% when applying different versions of Model 1.

The consequence of these differences is that for Model 1 only evidence is found that supports Hypothesis 2, which implies that firms indeed report higher goodwill impairments when earnings are 'unexpectedly' high. In contrast, for Model 2 only when applying version III similar evidence is found since then the sign of the effect is positive, while for all other versions of this model a negative sign is found. This is more consistent with profit maximilisation than with profit minimalisation or income smoothing. For Model 2 however, also evidence is found that does not support Hypothesis 1, implying that not loss maximalisation or big bath accounting but more loss minimalisation is being applied, since the sign of the effect is negative instead of positive as was expected. Therefore this hypothesis needs to be rejected. The same reasoning applies for the evidence that was found concerning Hypothesis 3. The sign is negative and significant, which implies that again loss minimalisation instead of loss maximalisation is being applied in the case of a CEO change. Therefore this hypothesis should also be rejected, since lower impairments are recorded around the time of a CEO change.

### 7.4 Alternative testing

This section will present the results of alternative tests for both models to determine whether the results presented in the previous section are robust. Noticeable is that since these are alternative tests, only briefly the results for the most important factors will be discussed here. Therefore only a summary of the main results will be incorporated at the end of each subsection.

### *7.4.1 Alternative testing Model 1*

In performing alternative tests, the first step is that the sample will be split-up based on whether the firm-year observations belong to a first-time adopter or an early adopter of IFRS. Next a distinction is also made between two periods: 2005-2006 and 2007-2008, as well as between the year 2008 and the period 2005-2007. Also each year is investigated separately to determine with more certainty which observations can cause distortions. This is done to possibly discover a trend or at least some differences between these periods as it is expected that impairments have become more important in more recent years. Also it may be possible that the year 2005, because of the introduction of IFRS, and the year (2007 and) 2008, due to the credit crisis, have a distorting effect on the results.

*Sample including only first-time adopters of IFRS*

The first step in alternative testing is to investigate whether any differences can be found in the reporting of impairments between first-time adopters and early adopters of IFRS. As was already discussed in section 5.4, it is important to make this distinction since early adopters of IFRS will have grounded reasons why they want to adopt IFRS early. A firm will therefore not choose to adopt IFRS unless it provides some sort of benefit to the firm as a whole or to management that decides on this subject. The inclusion of these early adopters can therefore lead to a distorted image of the results.

The total sample for this research consists of 366 firm-year observations (=excluding one outlier). Of this sample, 314 observations concern a firm that is a first-time adopter of IFRS in 2005. A total of 29 observations concern early adopters and these will therefore not be included in the sample for the regression in this part of the subsection. For another 23 observations it is unknown whether or not the firm was a first-time or an early adopter. To make sure that these observations do not cause a distorted image, these observations are therefore also excluded.

After eliminating these observations the following results are found. The explanatory power of the model has increased slightly from the maximum of 0.093 (1-III) to the maximum of 0.116 (1-III). This means that the conclusion can be drawn that including early adopters of IFRS in the total sample has led to a slightly distorting image of the total sample based on the fact that these firms would not have adopted IFRS early when this would not have led to some sort of benefits.

Concerning the regression coefficients, the effect of the variable $BATH_{it}$ does not have a significant influence on the impairment decision. This is similar to the results for the total sample, so including those observations that concern an early adopter of IFRS. This implies that the conclusion drawn earlier concerning this variable when applying Model 1 is confirmed by this alternative test.
The effect of the variable $SMOOTH_{it}$ is positive and significant at the 10% level for the models 1-I and I-V, which are the full model and the full model that as an addition includes the interaction term. For

the models 1-II and 1-III this effect is positive and significant at the 5% level. The fact that the sign of this variable is positive confirms the earlier conclusion. However, the significance level does differ. When tested for the total sample the 5% significance level was applicable for all versions of the model, and now this only holds for two of the four versions that incorporate this variable. But since the variable does have a significant influence in all cases, the conclusion can be drawn that the earlier conclusions are confirmed by this alternative test.
Concerning the variable $CEO_{it}$ the alternative test determines that the effect of this variable is not significant for all model versions. This confirms the earlier conclusion that a firm that experiences a CEO change does not record higher transitional goodwill impairment losses.
The effect of the interaction term $BATH_{it}$*$CEO_{it}$ on the impairment decision also proves not to be significant, which again confirms the conclusions drawn earlier. This indicates that a CEO change cannot be associated with the use of big bath accounting.

*Sample divided into two periods: 2005-2006 and 2007-2008 (total sample)*

The next step is to divide the sample into two time periods, namely 2005-2006 and 2007-2008. The reason for this separation is that because of the change in economic conditions due to the credit crisis, the effects of this on the companies may have already been incorporated in their annual figures. To control for this effect, the sample is therefore split-up into these two subsamples. For 2005, 102 observations have been incorporated in the sample and 106 for 2006, making up a subsample of 208 firm-year observations (*subsample A*). For 2007, 109 observations have been included and 49 observations for 2008, which leads to a subsample of 158 firm-year observations (*subsample B*).

When Model 1 is applied to these two subsamples, the explanatory power for subsample A increases slightly from 0.093 (1-III) to 0.115 (1-III) for the total sample in section 7.3.1. For subsample B the explanatory power however decreases to 0.074 (1-IV). This means that the model fits better with the observations from subsample A, meaning that the observations from subsample B cause a distorting effect on the results for the total sample. This result can be explained by the different economic conditions due to the credit crisis.

The results for the regression coefficients for subsample A show that the variables $BATH_{it}$, $CEO_{it}$ and the interaction term $BATH_{it}$*$CEO_{it}$ do not have a significant influence on the impairment decision. The effect of the variable $SMOOTH_{it}$ is however positive and significant at the 5% level. These results are similar to the results presented for the total sample. All together this therefore implies that the conclusions that were drawn earlier sustain after this alternative test.

When investigating subsample B, the results show that the variables $BATH_{it}$, $CEO_{it}$, $SMOOTH_{it}$ and the interaction term $BATH_{it}$*$CEO_{it}$ are all not significant. These results are similar to the results for the total sample for the variables $BATH_{it}$, $CEO_{it}$ and the interaction term $BATH_{it}$*$CEO_{it}$ but differ for the variable $SMOOTH_{it}$ since for the total sample this variable had a positive significant influence at the 5% level. A possible explanation for this difference can be the credit crisis. When the firm is already affected by the (first signs of the) crisis in 2007 and 2008, this can lead to a more conservative way of managing the firm. Management can therefore become more careful in choosing whether or not to manage earnings by using income smoothing. This result can therefore imply that less use is being made of income smoothing as a form of earnings management, and this is likely to be caused by the change in economic conditions and/or the more pessimistic forecasts for the future.

*Sample divided into two periods: 2005-2006 and 2007-2008 (only first-time adopters)*

When examining again the sample divided over two periods only now excluding the early adopters of IFRS, the explanatory power of the model for subsample A increases from 0.093 (1-III) for the total sample to 0.153 (1-III). For subsample B the explanatory power decreases to 0.071. These results can be interpreted as that including early adopters of IFRS in the sample leads to a distortion in the results.

When examining the period 2005-2006 (subsample A) excluding the early adopters of IFRS (leading to a sample of 89 observations for 2005 and 91 for 2006, making up a total of 180 observations for this period), the regression results show that the variables $BATH_{it}$ and $CEO_{it}$ and the interaction term $BATH_{it}$*$CEO_{it}$ do not have a significant effect on the impairment decision. The variable $SMOOTH_{it}$, does however have a significant positive effect according to these results at the 5% level. These results are consistent with the results presented earlier and therefore it can be concluded here that the conclusions drawn earlier sustain after alternative testing.

The same examination can be done for the period 2007-2008 (subsample B) (consisting of 90 observations for 2007 and 44 for 2008, making up a total of 134 observations after excluding early adopters of IFRS). The results show that none of the reporting incentives has a significant effect on the impairment decision. This means that the effects of the variables $BATH_{it}$, $SMOOTH_{it}$, $CEO_{it}$ and the interaction term $BATH_{it}$*$CEO_{it}$ are not significant. These results are consistent with the results for subsample A and the total sample including early adopters, except for the variable $SMOOTH_{it}$. This variable does have a significant positive effect when Model 1 is applied to these samples, namely at the 5% level. Therefore the same reasoning can be applied here as was done for subsample B including early adopters of IFRS, that the credit crisis has caused a more conservative way of managing the firm, which can lead to less use of income smoothing. This result can therefore be interpreted as that less use is being made of income smoothing as a form of earnings management, which is likely to be caused by the changing economic conditions and/or the more pessimistic forecasts for the future.

*Sample divided into two periods: 2005-2006-2007 and 2008 (only first-time adopters)*

Only the sample of first-time adopters will now be examined shortly to determine whether it is the year 2008 and not also the year 2007 that leads to a distortion in the regression results. The choice to run the regression for this alternative test for the sample consisting of only first-time adopters is based on a decrease in the explanatory power of the models when applied to the samples that incorporate early adopters, compared to similar samples that exclude these observations. Subsample C will therefore consist of a total of 270 observations for the period 2005-2007 (including 89 observations from 2005, 91 from 2006 and 90 from 2007). Subsample D consists of the 44 observations that come from the year 2008. An implication of this is that the results for subsample D are less reliable, since this subsample is relatively speaking quite small.

Before starting the discussion of the results, it is important to notice that the interaction term that was incorporated in the model has been excluded from the regression for the year 2008. The reason for this is that this variable has the value of zero for all 44 observations that originate from this year.

The results show that the explanatory power for subsample C is slightly higher (0.106 for 1-III) than for the total sample (0.093 for 1-III). For subsample D the explanatory power of Model 1 is now 0.153 (1-IV), which is higher than for the total sample. However, this model does not include the reporting incentives, indicating that these factors do not have any additional explanatory power. Therefore it can be concluded that the year 2008 has influenced the results for the total sample.

When examining the results of the regression coefficients for subsample C, the conclusion can be drawn that the variables $BATH_{it}$, $CEO_{it}$ and the interaction term $BATH_{it}*CEO_{it}$ do not have a significant effect on the impairment decision. This result is similar to the results presented for the total sample earlier. The effect of the variable $SMOOTH_{it}$ is however positive and significant for the model versions II and III, but not for the versions I and V where this variable is also incorporated. This result is therefore similar to the prior results for the versions II and III, but the significance levels do differ. Earlier the 5% level was applicable, while this is now 10%. A possible explanation can be that the year 2007 has now caused a distortion in the results when combining the observations from this year with the observations from 2005 and 2006. As seen before, the period 2007-2008 showed that this variable does not have an effect on the impairment decision. Therefore the effect of this variable can now have been weakened by including these observations since in this period less use is made of income smoothing. For the model versions I and V the results differ from the prior results. Again, this may have been caused by the credit crisis that has influenced management's perspective towards the use of income smoothing as a tool for earnings management.

The regression results for subsample D show that none of the reporting incentives has a significant effect on the impairment decision. This result is similar to the results of the total sample for the vari-

ables $BATH_{it}$, $CEO_{it}$ and the interaction term $BATH_{it}$*$CEO_{it}$, also when keeping in mind that the interaction term has been excluded for this sample since it has the same value for all observations. However, the effect of the variable $SMOOTH_{it}$ proves to be significant at the 5% level when applying the model to the total sample. Why this variable no longer has a significant effect can again be explained by the influence of the credit crisis and will therefore not be included here again.

*Investigating each year separately (only first-time adopters)*

Since some differences can be found when examining the different subsamples in alternative tests to determine whether the conclusions drawn based on the results for the total sample are robust, the choice is made that also the results for each year separately need to be investigated. The reason for this is that the results for the total sample can be caused or influenced by observations from a particular year that affect the results significantly. This holds especially for the year 2005, since this is the transition year to IFRS. The effect of this transition can however also still be present in the years 2006 and 2007 and therefore these are investigated separately as well. However, for the year 2008 but also for the year 2007, the effects of the credit crisis can become more clear, indicating that the observations from these years can also have an influence on the results and should therefore be investigated separately as well.

When examining all years separately, it can be concluded that the explanatory power of Model 1 for all years separately is higher than when these observations are combined into the total sample (including and excluding early adopters). So this means that the explanatory power is weakened when these observations are combined, since then the effects of the different observations are compensated. This can be caused by the introduction of IFRS on the one hand that can influence the effects of the different factors on the impairment decision upward, while the effects of the credit crisis on the other hand can influence the effects of these factors downward.

The results show that the variable $SMOOTH_{it}$ is the only significant variable for the observations from the year 2005 and that for all other years this reporting incentive, but also the other reporting incentives and the interaction term, do not have a significant influence on the impairment decision. These results therefore imply that the results presented for the total sample are strongly affected by the observations from the year 2005. This can be explained by the fact that when testing the year 2005 separately, only the first-time adopters of IFRS have been included, since early adopters proved to have a distorting effect on the results. The results can be interpreted as that income smoothing has been used only in 2005 by management which can be caused by the mandatory introduction of IFRS in 2005. These results indicate that the introduction of IFRS provided management the opportunity to immediately use the new regulations concerning the valuation of goodwill (IFRS 3) to manipulate earnings. This provides evidence that management smoothed earnings in 2005 and not in the later years under

investigation and that therefore Hypothesis 2 only holds for the observations for 2005. For all other years under investigation, the hypothesis should therefore be rejected.
Based on these results the conclusion needs to be drawn that the results as presented for the total sample in Table 11 do not sustain alternative tests (for each year separately), since the results are strongly affected by observations from the transition year to IFRS (2005).

The next table provides a summary of the results for all subsamples as discussed in this subsection for the variables of interest in the main model (=version I, so excluding the interaction term).

**Table 15: Summary regression results Model 1 – Regression coefficients**

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

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

### *7.4.2 Alternative testing Model 2*

This section presents the results of alternative tests for Model 2 to determine whether the results presented for the total sample in the previous section are robust. As for Model 1, the results will only be discussed briefly and therefore only a table summarizing the main results is incorporated here.

*Sample including only first-time adopters of IFRS*

This section will again investigate whether there can be found any differences in the reporting of impairments between first-time adopters and early adopters of IFRS, only now when applying Model 2. As discussed in the previous section, the total sample consists of 314 observations that concern a firm that is a first-time adopter of IFRS in 2005. All other observations are again excluded from the sample.

The results show that the explanatory power of Model 2 has increased slightly from 0.566 (2-V) to 0.605 (2-V) when applied to this sample. This indicates that including early adopters in the sample again causes a distortion in the results.

The regression for this sample provides the following results. Concerning the reporting incentives $BATH2_{it}$, and $SMOOTH2_{it}$, and the interaction term $BATH2_{it}*CEO_{it}$ the results are similar to the results presented for the total sample, since the effects of these variables are all significant and at the same level (1%). The signs of these variables are also similar to the ones presented earlier. Therefore the conclusions that were drawn concerning these variables based on the earlier results are confirmed by this alternative test.

However, concerning the variable $CEO_{it}$ a difference is detected. When Model 2 is applied to the total sample, this variable has no significant effect on the impairment decision. However, when applied to the sample consisting of only first-time adopters of IFRS, the variable has a significant positive effect at the 5% level for only Model 2-I. This result indicates that in this case evidence is found that CEO changes can be associated with the recognition of higher impairments, which implies that evidence is found in support of Hypothesis 3. A possible explanation for this difference in results can be that in the case of early adopters no or little CEO changes have taken place simultaneously with the recognition of an impairment loss, which can come from a certain amount of uncertainty regarding the introduction of IFRS. This could in turn lead to less CEO changes (of course less in the case of retirement), because firms are more careful not to loose their CEO since he should guide the firm and support the introduction process. Another possible explanation can be based on the assumption that early adopters have grounded reasons why they want to adopt IFRS early, since this would have to provide them with some sort of benefit. When narrowing the focus to only goodwill, it is possible that with the application of IFRS 3 no impairment needs to be recognized while previously a yearly amortization should have been booked. Since both an amortization and the recognition of an impairment loss can result in lower earnings or profits, this could provide an incentive for management to switch to the new regulations voluntarily in order to still make a level of earnings that provides them with a bonus, which would not be reached in the case that the yearly amortization would have been applied. This incentive can therefore cause a distortion in the results for the total sample, leading to no significant effect of this variable.

*Sample divided into two periods: 2005-2006 and 2007-2008 (total sample)*

The next step is that the sample is divided into two time periods, namely 2005-2006 and 2007-2008. Subsample A therefore consists of 208 firm-year observations that fall in the period 2005-2006 (*sub-sample A*) and the subsample for the period 2007-2008 consists of 158 firm-year observations (*sub-sample B*). Applying Model 2 leads to the following results.

The explanatory power of Model 2 has increased from 0.566 (2-V) to 0.781 (2-V) for subsample A. Also the explanatory power for subsample B increased slightly from 0.566 to 0.636 (2-V). This indicates that when the observations from these subsamples are combined in the total sample, the effects of the different variables are compensated by one another, leading to a lower explanatory power. This can again be explained by the introduction of IFRS on the one hand, and the effects of the credit crisis on the other hand and will therefore not be repeated here again.

When examining the regression results for subsample A, the conclusion can be drawn that they show similar results concerning the variables $BATH2_{it}$ and $SMOOTH2_{it}$ in that these variables are both significant for the model versions I, II, and III[15]. However, for Model 2-V only the variable $BATH2_{it}$ has a significant effect. Concerning the applicable significance levels and signs of these variables also some differences can be detected. For $BATH2_{it}$ the applicable significance level for the total sample is 1%, while this is 1% for Model 2-I and 2-II, but 10% for Model 2-V. However, the signs for this variable are similar to the earlier results, indicating that the conclusions drawn earlier based on the results for this variable sustain after alternative testing. The significance level that is applicable for the variable $SMOOTH2_{it}$ is 10% for Model 2-I and 2-II, but 1% for Model 2-III. The significance level for Model 2-III is therefore similar to the prior presented results. However, the sign for this variable is positive in three versions of the model (which is consistent with expectations), while the sign was negative for the versions I and II. This indicates that for subsample A the expected relation is found that firms are more likely to recognize a goodwill impairment loss when their earnings are 'unexpectedly' high. This implies that evidence is found in support of Hypothesis 2, which contradicts the previous results that pointed more in the direction of profit maximalisation instead of profit minimalization or income smoothing. The conclusions drawn previously concerning this variable therefore do not sustain after alternative testing.

Concerning the variable $CEO_{it}$ a negative significant relation is found only for Model 2-V at the 1% level, which contradicts with the results for the total sample since in that case this variable is not significant. This indicates that a CEO change can be associated with recording a lower (or no) impairment instead of higher. A possible explanation can be that the new CEO is not left with a poor inheritance that can justify an impairment or that the new CEO is under the impression that no impairment is

[15] Recall that Model 2-IV does not include any of the reporting incentives as incorporated in the developed model.

necessary. Also the new CEO can be careful since the introduction of IFRS can be a complicated process for firms. All together this therefore provides evidence that contradicts Hypothesis 3, implying that this hypothesis should be rejected for this subsample as well.
The interaction term that has been incorporated in Model 2-V proves to have a significant influence on the impairment decision for this subsample, as well as for the total sample. The applicable significance level as well as the sign of the factor are also similar, which implies that the prior conclusions concerning the interaction term are confirmed by this alternative test.

When examining the regression results for subsample B, the results are quite similar to the results for the total sample, however again some differences can be detected. At the 1% level the variables $BATH2_{it}$ and $SMOOTH2_{it}$ and the interaction term $BATH2_{it}$*$CEO_{it}$ are significant for both samples and all versions of the model, except for Model 2-III where $SMOOTH2_{it}$ is insignificant. The signs of these variables in all cases are similar. Overall it is therefore possible to conclude that the conclusions drawn earlier based on the results for these factors sustain after alternative testing.
Concerning the variable $CEO_{it}$ a difference can be detected since this variable has a significant positive effect on the impairment decision at the 5% level for Model 2-I, while this variable is insignificant when the model is applied to the total sample. This indicates that a CEO change can be associated with higher impairments. Therefore evidence is found that supports Hypothesis 3 that firms which experience a change in CEO record higher transitional goodwill impairment losses. This result could also be an indication that earnings management at the time of a CEO change has increased when comparing the two periods. This is an important finding since it can be interpreted as an indication that after the introduction of IFRS, the level of earnings management in the case of goodwill impairments has increased.

*Sample divided into two periods: 2005-2006 and 2007-2008 (only first-time adopters)*

This section presents the results for the regression when applying Model 2 and when the sample is divided into two periods as was also done in the previous subsection. Compared to the previously presented results, now the early adopters of IFRS have been excluded since these observations can cause a distortion in the results.

Based on these subsamples, the results show that the explanatory power of Model 2 has increased from 0.566 (2-V) to 0.830 (2-V) for subsample A and from 0.566 to 0.654 (2-V) for subsample B, which is consistent with the increases in explanatory power for the same sample division as discussed before only then including the early adopters of IFRS. Therefore the same reasoning can be applied here, indicating that the effects of the different factors are being compensated due to the introduction of IFRS and the credit crisis when combining these observations in the total sample and that including early adopters causes a distortion in the results.

For subsample A the regression results show similar results for the model versions I, II and III. The significance level of 1% and the sign for the variable $BATH2_{it}$ is similar to the prior results, indicating that the conclusions based on the prior results for this variable sustain after alternative testing. However, the sign of the variable $SMOOTH2_{it}$ is positive for subsample A while it is negative for the total sample. Also the applicable significance level for this variable differs since it is now 5% for Model 2-III and 10% for Model 2-I and 2-II. This indicates that no evidence is found that higher earnings are associated with higher recorded impairments. This result points more in the direction of profit maximalisation by not reporting an impairment instead of profit minimalisation or income smoothing. This therefore indicates that evidence is now found that contradicts Hypothesis 2, which implies that this hypothesis should now be rejected.

For this subsample the variable $CEO_{it}$ proves to be negative and significant at the 1% level for Model 2-V. This result contradicts with the prior results since in that case this variable is not significant. This indicates that for this sample a change in CEO cannot be associated with higher impairments, since the sign is negative. This points more in the direction of for instance more conservatism as discussed before which can lead to not recognizing an impairment by the new CEO. Therefore evidence is found that a firm that experiences a CEO change records lower transitional goodwill impairment losses, which implies that Hypothesis 3 should be rejected.

Concerning the interaction term, the conclusion can be drawn that this factor has a significant negative influence on the impairment decision at the 1% level, which confirms the earlier presented results. Therefore the conclusions that were drawn based on the results for this variable sustain after this alternative test.

The regression coefficients for subsample B show that the variables $BATH2_{it}$ and $SMOOTH2_{it}$ are significant at the 1% level for the model versions I, II and V, which is similar to the results for the total sample. In this case the signs of both variables are also similar, which implies that the conclusions drawn earlier based on the prior results are confirmed by this alternative test. However, also a difference can be detected when applying Model 2-III, since then $SMOOTH2_{it}$ is no longer significant. This result suggests that income smoothing is not applicable here, but since all other model versions show that this variable is significant, the overall conclusion can be drawn that this variable is significant. The results after alternative testing are therefore consistent with the prior results.

For this subsample the variable $CEO_{it}$ proves to be positive and significant at the 1% level for Model 2-I. This result contradicts with prior results since in that case this variable is not significant. The sign of this variable is however positive which is according to expectations. This therefore indicates that a CEO change can be associated with higher impairments. Therefore evidence is provided that supports Hypothesis 3 that a firm experiencing a CEO change records higher goodwill impairment losses.

The results for the interaction term are similar to those for the total sample, since this variable is significant at the 1% level and has a negative sign for both samples. Therefore the conclusions drawn earlier based on the results for the interaction term are robust.

*Sample divided into two periods: 2005-2006-2007 and 2008 (only first-time adopters)*

Only the sample of first-time adopters will now be examined shortly to determine whether it is the year 2008 instead of the period 2007-2008 that leads to a distortion in the regression results. Noticeable is that the sample for the period 2005-2007 (subsample C) consists of 271 firm-year observations and the sample for 2008 (subsample D) consists of only 44 observations, so it is important to realize that the results for the year 2008 are less reliable because of the relatively smaller sample size.

For subsample C the explanatory power has now increased slightly from 0.566 (2-V) to 0.655 (2-V). However, for subsample D the explanatory power has decreased to 0.335 (2-III). This indicates that the results for subsample D have caused a distorting effect on the results for the total sample, since for this sample the explanatory power is much lower. These results can be explained by the change in economic conditions due to the credit crisis, meaning that firms and management now respond differently to certain conditions, which leads to less explanatory power of this model.

When examining the regression coefficients for the period 2005-2007 the results show that the reporting incentives $BATH2_{it}$ and $SMOOTH2_{it}$, and the interaction term are significant at the 1% level, which is similar to the results for the total sample. The signs of these variables are also similar. This indicates that the conclusions drawn concerning these factors based on the earlier results sustain after alternative testing.

Concerning the variable $CEO_{it}$ however a difference can be detected, since this variable now has a significant positive effect on the impairment decision at the 5% level, while it proves not to be significant for the total sample. This indicates that specifically in the period 2005-2007 more CEO changes have taken place simultaneously with the recognition of higher impairments, since now this variable is significant. Therefore evidence is found in support of Hypothesis 3 when Model 2 is applied to this sample, which implies that firms that experience a CEO change record higher transitional goodwill impairment losses.

The results for subsample D show that the reporting incentives $BATH2_{it}$, $SMOOTH2_{it}$ and $CEO_{it}$ and the interaction term have no significant influence on the impairment decision. This result contradicts the results for the total sample since in that case the factors $BATH2_{it}$ and $SMOOTH2_{it}$ do have a significant influence at the 1% level. This can be explained as that in 2008 less (or no) use is being made of earnings management in the form of big bath accounting or income smoothing. A possible reason for this can be, as discussed earlier, that due to the credit crisis, management is confronted with more uncertainty and therefore acts carefully which can lead to less use of earnings management. This result can also be explained as that impairments are being delayed based on changes in the economic conditions in 2008 due to the credit crisis, leading to more uncertainty concerning forecasts of future earnings. All together, this therefore implies that firms are less likely to recognize a goodwill impairment

loss when their earnings are 'unexpectedly' high, but also when they are 'unexpectedly' low. This provides evidence that Hypothesis 1 and 2 should be rejected. The results also imply that firms that experience a change in CEO do not record higher goodwill impairments, which implies that Hypothesis 3 should be rejected.

*Investigating each year separately (only first-time adopters)*

Since some differences have been detected when performing the previously discussed alternative tests, also an additional test will be performed that investigates each year under investigation separately. This is again done to investigate whether observations from one year in particular influence the results. Especially for the observations from the years 2005 and 2008, it is expected that they can cause a distorting effect on the main results.

The results of the explanatory power show that for the year 2005 the explanatory power is -0.051 (2-IV), meaning it has decreased substantially when compared to the explanatory power of 0.566 for the total sample. This result can be explained by the mandatory introduction of IFRS in this year, which has apparently led to substantially different behaviour of firms and their management than predicted by the model. For 2006 and 2007 the explanatory power now is high, 0.859 (2-V) and 0.786 (2-V) respectively. For 2008, the explanatory power of Model 2 is low as discussed in the previous part, 0.335 (2-III). This can be explained by the credit crisis. Therefore the conclusion can be drawn that the high explanatory power of Model 2 for the years 2006 and 2007 shows that the model can predict the impairment decision accurately under 'normal' circumstances, when isolating the effects of the introduction of IFRS and the credit crisis in the years 2005 and 2008. Therefore this alternative test shows that the observations from the 2005 and 2008 cause a distortion in the results for the total sample.

The results show that for the year 2005 no variables at all have a significant effect on the impairment decision, while for the total sample the results for a large number of variables, including the reporting incentives big bath accounting and income smoothing and the interaction term, were highly significant. Similar results concerning these important variables are also found for the year 2008 as discussed previously. It seems that in 2005 management was awaiting further developments as a consequence of the introduction of IFRS and that the results for 2008 can be explained as before by the effects of the credit crisis. However, for the years 2006 and 2007 the results differ substantially. For the year 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. The applicable significance level for $BATH2_{it}$ is 1%, which is similar to the prior results. The applicable significance level for $SMOOTH2_{it}$ differs between 1% (2-III), 5% (2-I) and 10% (2-II). This indicates that these results differ from those for the total sample based on the applicable significance level. In addition, for version V these reporting incentives do not have a significant effect on the impairment decision, which contradicts with the results for the total sample. However, for

the other versions of Model 2, the sign of the variable $SMOOTH2_{it}$ is positive while this 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 as has already been explained earlier. The result for the interaction term is similar to the prior results for the total sample, since it is negative and significant at the 1% level. Therefore the conclusions drawn based on the earlier results for this factor are robust.

For 2007 on the other hand 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 overall 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 in that case this variable is not significant. This therefore indicates that in the year 2007 more CEO changes occurred simultaneously with the recognition of higher impairment losses. Therefore now evidence is found that a firm that experiences a change in CEO recognizes higher impairments, which is in support of Hypothesis 3. The interaction term also proves to be negative and significant at the 1%, which is similar to the results for the total sample. This implies that the conclusions drawn based on this factor for the total sample sustain after this alternative test.

Based on these results, the conclusion can be drawn that the years 2005 and 2008 cause a distortion in the results for the total sample, since they weaken the effects of the different reporting incentives on the impairment decision.

The table on the next page provides a summary of the results for all subsamples as discussed in this subsection for the variables of interest in the main model (version I, so excluding the interaction term).

**Table 16: Summary of regression results – Regression coefficients**

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

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

## 7.5 Summary and conclusion

This chapter presented the results of running the regression for the two different models. The results have been presented in section 7.3 for the main sample, the period 2005-2008. First the results for the explanatory power (model summary and ANOVA table) have been presented to determine whether the models can predict the dependent variable accurately. The conclusion was drawn that the explanatory power of Model 2 is significantly higher than that of Model 1, indicating that Model 2 more accurately predicts the impairment decision. After discussing the explanatory power, a table was presented that showed the resulting regression coefficients. After discussing these results for the main sample for both models, a comparison was made between these models. The results indicated that the differences between the results of the two models were substantial. For Model 1 none of the reporting incentives proved to have a significant influence on the impairment decision, while for Model 2 the variables $BATH2_{it}$ and $SMOOTH2_{it}$ and the interaction term proved to influence the impairment decision significantly.

In section 7.4 alternative tests were performed for each model in a separate subsection. Concerning the explanatory power, the conclusion can be drawn that overall including early adopters of IFRS in the sample leads to a slight distortion of the presented results for both models. Also the results show that

the explanatory power of the models increases when examining only subsample A (2005-2006), both including and excluding early adopters of IFRS. Also when the years 2006 and 2007 are investigated similar changes (increases) occur for both models as well as when the period 2005-2007 (subsample C) is being investigated. For all other subsamples in the alternative tests, the changes in explanatory power occur in opposite directions. These differences can be explained on the one hand by the mandatory introduction of IFRS in 2005, and on the other hand by the effects of the credit crisis that have become more clear especially in the year 2008. However these differences do indicate that the results of the use of both models does not lead to similar results, which is a remarkable finding.

The results of the alternative tests concerning the regression coefficients indicate that the conclusions drawn based on the results for the main sample are not always robust. For Model 1 the proxy for income smoothing no longer has a significant effect for the sample period 2007-2008 (including and excluding early adopters), as well as when the model was applied to only the year 2008 (excluding early adopters). When investigating all years separately, the conclusion needed to be drawn that the proxy for income smoothing was the only significant variable for only the observations from the year 2005. This implied that the results for the total sample were influenced heavily by the observations from the transition year to IFRS.
For Model 2 also differences were detected in the results of the alternative tests compared to the regression for the total sample. The variable $CEO_{it}$ proved to have a significant influence on the impairment decision for the sample that included only first-time adopters of IFRS. For the sample period 2005-2006 (including early adopters) the variable $SMOOTH2_{it}$ proved to have a significant effect but with a different sign than for the total sample. Also the variable $CEO_{it}$ proved to have a significant effect on the impairment decision, while this relation was not found for the total sample. Also for the sample period 2007-2008 this result for $CEO_{it}$ was found. The results for the period 2005-2006 excluding early adopters also showed that the sign of $SMOOTH2_{it}$ was different than for the total sample and that $CEO_{it}$ was again significant while this was not the case for the total sample. However, the period 2007-2008 (excluding early adopters) now showed that $SMOOTH2_{it}$ was no longer significant and that the results for $CEO_{it}$ were similar to the period including the early adopters. For the period 2005-2007 the difference could be detected that $CEO_{it}$ was again significant and not for the total sample. When examining the years 2008 and 2005 separately however, none of the reporting incentives proved to have a significant influence on the impairment decision, which could be explained based on the effect of the transition to IFRS and the credit crisis. For the years 2006 and 2007 the results differed. The results for the year 2006 for the variables $BATH2_{it}$ and $SMOOTH2_{it}$ did not provide conclusive evidence about whether or not the conclusions that were drawn based on the results for the total sample were robust. However, the variable $CEO_{it}$ in this case did have a significant effect. For the year 2007 the only difference that was detected concerned again the variable $CEO_{it}$ that now had a significant effect and previously not.

An interesting finding that has come forward concerns the interpretation of the provided evidence. This not so much concerns evidence about the use of the methods income smoothing and big bath accounting as a form of earnings management. More the focus is on the use of less extreme measures that management can take to influence earnings and which can explain why the variables $BATH_{it}/BATH2_{it}$ and $SMOOTH_{it}/SMOOTH2_{it}$ may not have a significant effect on the impairment decision in some cases. As already suggested earlier, an indication is found that profit maximalization is being used instead of profit minimalization, which is associated with income smoothing. In this case the recognition of an impairment loss is delayed in order to present a profit that is as high as possible. As seen from another point of view, an indication is also found that loss minimalization is being used by management instead of loss maximalization that can be associated with big bath accounting.

# *Chapter 8: Summary and conclusion*

This research consists of a theoretical and an empirical part. The theoretical part is discussed in the chapters 2 through 5 of which a summary is provided here.

Chapter 2 discusses earnings management. The definition of Schipper (1989) is chosen as the most appropriate one for this research and implies that particularly the private gains of management form the basis for engaging in earnings management. The existence of earnings management is explained based on the Positive Accounting Theory and the Agency Theory. Also the types of earnings management are discussed in this chapter of which big bath accounting and income smoothing are the most important for this research. Chapter 3 defines goodwill as being the estimated future benefits that can be generated from the acquired firm. The impairment of goodwill is defined as verifying whether any changes in the value of goodwill have occurred. In this chapter the conclusion is drawn that a high level of subjectivity is associated with the impairment test and that this subjectivity provides management with the opportunity to influence the impairment calculation and consequently the presented earnings in the financial statements. The next chapter provides a review of important empirical literature for this research. First, evidence is discussed that suggests that earnings are indeed managed by taking a bath or smoothing income. Also evidence regarding the link between goodwill impairments and earnings management is discussed. Overall the evidence suggests that the impairment decisions of firms are influenced by managerial reporting incentives other than just economic factors. The role of these incentives in the impairment decision is associated with the potential for discretion induced by certain firm characteristics and the flexibility in the accounting standards in place. After this literature review, Chapter 5 discusses the hypotheses development and research design. In this process, the model of Van de Poel et al. (2008) is chosen as the point of departure for the development of a model. Adjustments are therefore made based on the choice which variables to include in the two models for this research. This choice is in turn based on economical considerations, the effects on the goodwill impairment decision in prior studies and the relevance of the different factors for this research. After the model development, the sample consisting of all Dutch listed firms in the period 2005-2008 is selected, leading to an initial sample size of 1.529 observations. From this sample, observations concerning inactive firms are excluded, as well as observations for which not all data is available. In addition, also those observations have been excluded in which no goodwill opening balance is present and simultaneously no impairment is recorded. Chapter 6 then discusses the descriptive statistics of the sample when divided into multiple industries, of which the industry 2000 Industrials is relatively the largest in the sample. This indicates that the results of the regression analysis are most reliable for this industry. Based on the descriptive statistics for the variables the conclusion is drawn that only in a small number of cases a condition for big bath accounting and income smoothing are found. However, for the impairment sample the proxies for big bath accounting are higher than for the non-impairment

sample, indicating that the conditions for the use of big bath accounting are more present for the observations in which indeed an impairment loss is being recognized. For income smoothing, the mean values of the proxy are higher for the non-impairment sample, indicating that the conditions may not have been 'unexpected' or abnormal enough to provide an incentive for recognizing an impairment.

In this research the following research question is the central point of attention:

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

The answer to this question can be derived from the results presented in Chapter 7 and depends on the model that is being applied, since the results that are generated by applying both models differ substantially. This provides evidence that the statement made by Van de Poel (2008), which implied that the use of a dummy variable or amount to measure the impairment decision does not lead to different results, is incorrect when applied to this research. This is therefore an important contribution of this research to the existing literature, since it provides evidence that the results presented depend on the type of measurement that is being applied for the dependent variable, a dummy variable or the impairment amount deflated by total assets.

The results of the regression analysis for the main sample show that for Model 1 goodwill impairments are indeed being used as a tool for earnings management but only in the form of income smoothing. Therefore the answer to the research question is affirmative. However, when examining the results of the alternative tests into more detail, these show that this relation only holds for the observations from 2005. Therefore the conclusion needs to be drawn that when applying Model 1, only for those observations that come from the year 2005 goodwill impairments are being used as a tool for earnings management. Therefore the results presented for the main sample are not robust, since they are highly influenced by the observations from the transition year to IFRS. So the answer to the research question for Model 1 is only affirmative for the observations from 2005. These results therefore indicate that the introduction of IFRS has provided management with the opportunity to use the new regulations for the valuation of goodwill (IFRS 3) to smooth income.

The results of the regression analysis when applying Model 2 for the main sample show that overall the effects of the proxies for big bath accounting and income smoothing are negative. This implies that goodwill impairments are not used as a tool for earnings management in the form of big bath accounting and income smoothing. These results imply more that goodwill impairments are used in a less extreme manner. This indicates that the results point more in the direction of loss minimalisation and profit maximalisation, which implies that impairments may be delayed under such conditions in which earnings are 'unexpectedly' high or low. Therefore the answer to the main question should be nega-

tive. However, when examining the results of the alternative tests into more detail, these show that for the years 2005 and 2008 none of the reporting incentives are significant. In addition, for 2006 no conclusive evidence is found based on which the conclusion can be drawn whether or not the results for the main sample were robust, so therefore no concrete judgements can be provided on this issue. However, for the years 2006 and 2007 evidence is found that a firm that experiences a change in CEO records higher goodwill impairments. Therefore, concerning this variable, the conclusion must be drawn that the main results do not sustain the alternative tests, since the results for this sample are highly influenced by the observations from the years 2005 and 2008.

An implication of these results is that no evidence is found for both models simultaneously that goodwill impairments are being used as a tool to manage earnings. However, this research does provide evidence from the Netherlands that standard setters like the IASB, FASB and the Raad voor de Jaarverslaggeving (RJ) in the Netherlands should be aware of the fact that goodwill impairments can in fact be used to manipulate earnings. It is clear that the application of the impairment test in the case of goodwill is highly subjective, which provides more opportunities to manage earnings through the use of goodwill impairments. Therefore it is recommended that the level of subjectivity associated with the application of an impairment test is lowered by developing some sort of guidelines for management (and auditors that need to check the calculations) to perform the impairment calculation. These guidelines could for instance be based on experiences from management (what are the most difficult parts of the impairment calculation?) and auditors in practice (which parts of the impairment calculation are highly subjective and therefore difficult to check? Are there common practices or important issues that can be used as a guideline by auditors for checking the impairment calculations?). More research should be performed on this subject to make it possible to include potential guidelines for instance in the standards, or to provide the standards with more precise descriptions about how to perform the impairment test. This in turn would make it easier for auditors to check the impairment test and can therefore lower the subjectivity that is associated with it (in the case of goodwill).

Since the results of this research do not provide compelling evidence in all cases that goodwill impairments are used as a tool for earnings management, which contradicts expectations, this research is an important contribution to the existing literature since prior research of amongst others Zucca and Campbell (1992) and Van de Poel et al. (2008) provided evidence that firms indeed use the impairment of goodwill as a tool for earnings management. A possible explanation can be that this research has only focused on Dutch listed firms, while for instance the research of Van de Poel et al. (2008) focused on listed companies in 15 EU countries preparing financial statements under IFRS. It is possible that the average level of earnings management in the Netherlands is quite low compared to other European countries and that this therefore leads to such different results. Another possible explanation can be that the level of earnings management differs substantially between industries, which has not

been investigated here. Therefore overall the level of earnings management can be quite low in the Netherlands. Also it is possible that the auditors of these Dutch firms perform sufficient tests in order to detect more precisely whether management has used unrealistic assumptions and estimations in the impairment calculation. This in turn can lead to fewer opportunities to manage earnings. However, this may be difficult in practice since management is assumed to have more insight in the value of goodwill, which makes the task of checking the impairment calculation difficult.

A limitation of this research is therefore that no results have been generated for each industry separately, which could have an influence on the results. However, the reason why this is not done is that the size of the subsamples would then overall be relatively small[16], making the results less reliable.
Another limitation of this research is that it has not been taken into account whether the opening balances of the goodwill consist of 'old' or 'new' goodwill. This may be important since, as already discussed in previous chapters, it is possible that a company needs to recognize an impairment loss soon after acquisition. This could be an indication of mismanagement, because the impairment can then be seen as a sign that the firm has paid too much at the time of acquisition. Not making a distinction between old and new goodwill could therefore lead to a distorted image of the results. A distinction can thus be made to make more clear whether management has made good choices regarding acquisitions. Future research on this subject is necessary to determine whether it is possible to gather information regarding the distinction between old and new goodwill on the balance sheet of a company and to investigate whether making such a distinction can have an effect on the results.

Another possibility for future research can be to investigate what the effects are of the introduction of IFRS on the level of earnings management in the Netherlands with regard to goodwill. This could be done by examining observations from a certain period before and after the introduction, so a period where amortization is applied and a period where impairments are applied. Also the influence of the introduction of the revised standard IFRS 3R could be investigated in a similar manner in the future.

Also it is possible to investigate each industry separately to determine whether significant differences exist between the industries in the use of goodwill impairments to manage earnings. In line with this suggestion it is also possible to focus research on only the industry 8000 Financials that has been left out of this research, since for that industry different laws and regulations need to be applied. Also the financial firms can be compared to non-financial firms. This can be interesting since, especially in the banking sector, high bonuses are being received by management and this can possibly be an indication that earnings management is being applied to earn higher bonusses.

[16] This does not hold for the industry 2000 Industrials since this industry contains 134 firm-year observations, and also to a lesser extent for the industries 3000 Consumer Goods, 5000 Consumer Services and 9000 Technology. However, for all other industries the subsample would be too small in order to present strong conclusions.

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# *Appendix 1*

The 4-step process for applying the impairment test as described in the article by Dagwell et al. (2007, pp. 866-868) is depicted and explained into further detail in this appendix.

**Step 1**: Ascertain the recoverable amount of the relevant cash generating unit.

A *cash generating unit* is the smallest identifiable group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows from other assets or groups of assets (IAS 36.6). This means that a cash generating unit represents the lowest aggregation of assets that generates largely independent cash inflows from continuing use.

The *recoverable amount* is the highest of the unit's net selling price or fair value less costs to sell (IAS 36.6) and its value in use.

The *fair value less costs to sell* is "*the amount obtainable from the sale of an asset or cash-generating unit in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal.*" (IAS 36.6) Another similar definition for fair value emphasizes more on the willingness of the parties by adding "*who are under no compulsion to act*" (CICBV, 2002, pp. 6), since this can be of influence on the value that will be determined. However, in essence, both definitions lead to the same 'fair value' that is being recognized.

The *value in use* involves the calculation of the net present value of the estimated future cash inflows and outflows to be derived from continuing use of the asset. IAS 36.IN6 clarifies that the following elements should therefore be reflected in this calculation:

- An estimate of the future cash flows the entity expects to derive from the asset.
- Expectations about possible variations in the amount or timing of those future cash flows.
- The time value of money, represented by the current market risk-free rate of interest.
- The price for bearing the uncertainty inherent in the asset.
- Other factors, such as illiquidity, that market participants would reflect in pricing the future cash flows the entity expects to derive from the asset.

The Standard (IAS 36.30) also clarifies that the second, fourth and fifth element mentioned above can be reflected either as adjustments to the future cash flows or to the discount rate.

**Step 2**: Determine the carrying amount of the net assets (including goodwill) of the relevant cash generating unit. If the carrying amount exceeds the recoverable amount, an impairment loss must be recognised.

The *carrying amount* for a cash generating unit is represented by the book value of the individual assets (including goodwill) and liabilities pertaining to that unit. In other words, it is "*the amount at which an asset is recognised after deducting any accumulated depreciation (amortisation) and accumulated impairment losses thereon*" (IAS 36.6).

**Step 3**: If recognizing an impairment loss is required, determine the implied value of the goodwill. This is the excess of the recoverable amount of the cash generating unit over the net fair value of the unit's identifiable assets, liabilities and contingent liabilities that the entity would recognise if it acquired that cash generating unit in a business combination on the date of the impairment test.

**Step 4**: Reduce the carrying amount of goodwill by the amount of the impairment loss. If the amount of the impairment loss exceeds the carrying amount of goodwill, the excess amount should be written off against other assets of the cash generating unit. This is done by determining, at the moment of acquisition, the proportion that the book value will make up of the entire cash generating unit. The goodwill impairment loss will then be allocated to each of the assets in the cash generating unit based on this proportion (or percentage). (IAS 36.104)

# *Appendix 2*

Van de Poel et al. (2008, pp. 21) use the following model in their research:

$$IMP_{it} = \alpha_0 + \alpha_1 GW_{it-1} + \alpha_2 SIZE_{it} + \alpha_3 \Delta indROA_{it} + \alpha_4 \Delta SALES_{it} + \alpha_5 \Delta CFO_{it} + \alpha_6 BATH_{it} + \alpha_7 SMOOTH_{it} + \alpha_8 BIG4_{it} + \alpha_9 BATH_{it} * BIG4_{it} + \alpha_{10} SMOOTH_{it} * BIG4_{it} + \Sigma \alpha_j Controls_{itj} + \varepsilon_{it}$$

$IMP_{it}$ = indicator variable (equal to 1 if impairment reported, else 0)

$GW_{it-1}$ = ratio of firm i's opening balance of goodwill on total assets

$SIZE_{it}$ = natural logarithm of firm i's total assets

$GW\_COUNTRY_{it}$ = median proportion of goodwill on the opening balance sheet in the country in which firm i is domiciled

$\Delta GDP_{it}$ = the % change in Gross Domestic Product from year t-1 to year t in the country in which firm i is domiciled

$\Delta indROA_{it}$ = the % change in firm i's industry ROA from year t-1 to year t

$\Delta SALES_{it}$ = the % change in firm i's sales from year t-1 to year t

$\Delta CFO_{it}$ = firm i's change in operating cash flows from year t-1 to year t, divided by total assets at the end of year t-1

$BATH_{it}$ = indicator variable to proxy for 'big bath' reporting (equal to one if the change in firm i's pre-impaired earnings from year t-1 to t, divided by total assets at year t-1 is below the median of non-zero negative values, else 0)

$SMOOTH_{it}$ = indicator variable to proxy for 'earnings smoothing'(equal to one if the change in firm i's pre-impaired earnings from year t-1 to t, divided by total assets at year t-1 is above the median of non-zero positive values, else 0)

$BIG4_{it}$ = indicator variable (equal to 1 in case of a Big 4 auditor, else 0)

$LAW_{it}$ = the 'rule of law' score for the country in which firm i is domiciled from Kaufmann et al. (2007)

# *Appendix 3*

Francis et al. (1996, pp. 122-124) use the following model in their research:

$$\textbf{WRITE-OFF}_i = a_0 + a_1\textbf{RET1}_i + a_2\textbf{RET5}_i + a_3\textbf{BTM}_i + a_4\Delta\textbf{BTM}_i + a_5\Delta\textbf{ROA}_i + a_6\textbf{IND\_GROWTH}_i + a_7\textbf{IND\_}\Delta\textbf{BTM}_i + a_8\textbf{IND\_}\Delta\textbf{ROA}_i + a_9\Delta\textbf{MGMT}_i + a_{10}\textbf{POOR}_i + a_{11}\textbf{GOOD}_i + a_{12}\textbf{HIST}_i + a_{13}\textbf{IND\_HIST}_i + a_{14}\textbf{SIZE}_i + \varepsilon_i$$

*WRITE-OFF*$_i$ = reported amount of the write-off deflated by total assets at the end of year t-1 for write-off firms and 0 for non-write-off firms

*RET1*$_i$ = cumulated abnormal return on security i computed over the year (about 250 trading days) preceding the announcement of the write-off. For non-write-off firms this variable is computed after randomly assign non-write-off firms the announcement dates of the write-off firms.

*RET5*$_i$ = similar to RET1 except the return are measured over the period beginning five years prior to the write-off and ending one year prior to the write-off.

*BTM*$_i$ = firm i's industry-adjusted book-to-market ratio measured at the end of year -1

*ΔBTM*$_i$ = mean change in firm i's book-to-market ratio over years -5 to -1

*ΔROA*$_i$ = mean change in firm i's return-on-assets ratio over years -5 to -1

*IND_GROWTH*$_i$ = mean of the annual median percentage sales growth of all firms in the same industry as firn measured over years -5 to -1

*IND_ΔBTM*$_i$ = mean change in firm i's industry median book-to-market ratio over years -5 to -1

*IND_ΔROA*$_i$ = mean change in firm i's industry median return-on-assets ratio over years -5 to -1

*ΔMGMT*$_i$ = 1 if firm i had a change in key management in year -1 or in year 0 and 0 otherwise

*POOR*$_i$ = UE$_i$ if UE$_i$ < 0 and 0 otherwise (UE = unexpected earnings = [operating earnings in year 0 - operating earnings in year - 1]/total assets at the end of year -1)

*GOOD*$_i$ = UE$_i$ - WRITE-OFF$_i$ if > 0 and 0 otherwise

*HISTORY*$_i$ = number of years in which firm i reported negative special items in the five years preceding the write off

*IND_HIST*$_i$ = mean value of HIST for all firms (except firm i) in firm i's industry

*SIZE*$_i$ = log of firm i's sales in year t- 1

# *Appendix 4*

Beatty and Weber (2006, pp. 273) use the following model in their research:

**Impair = α + β1NWSlack + β2INWSlack + β3AsstPrc + β4AsstPrc ∗ HRisk +β5Bonus**
**+ β6Tenure + β7Nasdaq/Amex + β8Delist +β9Delist ∗ ExpectedImpair**
**+ β10ExpectedImpair +β11OneSegment ∗ ExpectedImpair + β12M/B(Assets)**
**+β13PropNow/o + β14OneSegment + β15StdRet + β16Size +β17Leverage + ε (1)**

*Impair* = a dichotomous variable equal to one if the firm recorded a goodwill impairment as a cumulative effect of accounting change from adoption of SFAS 142
*NWSlack* = (if the firm has a net worth covenant) the rank of covenant slack, calculated as the book value of equity (Compustat 60) less the net worth threshold, divided by the goodwill balance at the beginning of the year (Compustat 204), zero otherwise
*INWSlack* = *NWSlack*, if mandatory accounting changes are included in covenant calculations, zero otherwise
*AsstPrc* = the coefficient from a time-series regression of price per share (Compustat quarterly data item 14) on earnings from continuing operations per share (Compustat quarterly data item 177) using the 20 quarters of data prior to the adoption of SFAS 142
*HRisk* = a dichotomous variable that is one if the firm has a *StdRet* value that is above the median for our sample firms
*Bonus* = a dichotomous variable equal to one if the firm's proxy statement in the year prior to the adoption of SFAS 142 discloses the existence of an earnings based bonus plan that does not exclude special items, zero otherwise
*Tenure* = the number of years that the CEO has held that position
*Nasdaq*/*Amex* = a dichotomous variable equal to one if the firm trades on either the NASDAQ or the AMEX, zero otherwise
*Delist* = a dichotomous variable equal to one if recording the expected goodwill impairment would cause the firm to violate the NASDAQ or AMEX listing requirements, zero otherwise
*ExpectedImpair* = a dichotomous variable equal to one if the book value of equity exceeds the market value of equity, zero otherwise
*M*/*B*(*Assets*) = the ratio of the market value of the firm's assets (Compustat 6−Compustat 60+Compustat 199 ∗ Compustat 25) divided by the book value of the firm's assets (Compustat 6)
*PropNoW* /*O* = the fraction of the quarters in the three years before SFAS 142 was adopted that the firm did not recognize a charge associated with a special item (Compustat quarterly data item 177=Compustat quarterly data item 11), zero otherwise
*OneSegment* = a dichotomous variable equal to one if the firm has one business segment, zero otherwise
*StdRet* = the firm's standard deviation of daily returns for the year prior to the adoption of SFAS 142
*Size* = log of market value of equity (Compustat data item 199 ∗ Compustat data item 25)
*Leverage* = the ratio of debt (Compustat 9 + Compustat 34) to total assets (Compustat 6) in the year prior to SFAS 142 adoption.

# *Appendix 5*

Henning et al. (2004, pp. 114) use the following model in their research:

$$\mathbf{IMPAIR}_j = \alpha_0 + \alpha_1\mathbf{AGE}_j + \alpha_2\mathbf{RESID}_j + \alpha_3\mathbf{SIZE}_j + \alpha_4\mathbf{PERFORMANCE}_j + \alpha_5\mathbf{RESID}_j * \mathbf{PERFORMANCE}_j + \varepsilon_j$$

$IMPAIR_j$ = one if a firm recognized an impairment, zero otherwise.
$AGE_j$ = the log of the number of months from the acquisition until the write-off or revaluation month.
$RESID_j$ = the purchase price of the net assets acquired minus the pre-offer fair market value of the net assets acquired minus CORE.
$SIZE_j$ = the log of net sales of firm $j$ at the end of the year preceding the write-off.
$PERFORMANCE_j$ = the cumulative abnormal return of stock $j$ between the acquisition date and the end of the year preceding the write-off. The performance measurement window for control firms starts on the acquisition date and ends on the acquisition date plus the average length of the repricing period for the write-off firms in the same industry.
$RESID_j \times PERFORMANCE_j$ = the interaction of the variables defined above. If H2a is correct, then firms with high $RESID_j$ and relatively poor performance are more likely to recognize a write-off than other firms.

# *Appendix 6*

Masters-Stout et al. (2007, pp. 6) use the following model in their research:

$$\textbf{Impairment} = \alpha + \beta_1\,\textbf{GW} + \beta_2\,\textbf{NI} + \beta_3\,\textbf{loss} + \beta_4\,\textbf{internal} + \beta_5\,\textbf{external} + \beta_6\,\textbf{NewCEO} * \textbf{NI} + \varepsilon$$

*Impairment* = the impairment after taxes (Compustat item A369), impairment before taxes/assets (Compustat items A368/A6), or impairment after taxes/sales (Compustat items A369/A12)
*GW* = goodwill before impairment (Compustat item A204 + A368)
*NI* = net income (Compustat item A172)
*loss* = 1 if net income is negative; otherwise 0
*internal* = 1 if CEO tenure is less than 3 years and CEO has been with the company less than 3 years prior to the appointment; otherwise 0
*external* = 1 if CEO tenure is less than 3 years and CEO has been with the company more than 2 years prior to the appointment; otherwise 0
*New CEO* = 1 if CEO tenure is less than 3 years; otherwise 0.

# *Appendix 7*

Lapointe-Antunes et al. (2008, pp. 43) use the following model in their analysis:

$$\mathbf{TGIL_i = a_0 + \lambda_1 GOODWILL_i + \lambda_2 EXCGWILL_i + \lambda_3 RUNITS_i + \lambda_4 ROE1_i + \lambda_5 ROE3_i + \lambda_6 CDEBT_i + \beta_7 DEVROE_i + \beta_8 CHANGE_i + \beta_9 PERBONUS_i + \beta_{10} ITMEXERC_i + \beta_{11} FIN_i + \beta_{12} CLIST_i + \beta_{13} AC_i + \beta_{14} OWN_i + \beta_{15} SIZE_i + IND_i + \varepsilon_i}$$

$TGIL_i$ = Reported transitional goodwill impairment loss deflated by lagged total assets
$GOODWILL_i$ = Opening balance of goodwill defl ated by lagged total assets (+)
$EXCGWILL_i$ = Difference between the market value and the book value of the firm at the end of the year preceding the adoption of Section 3062 deflated by lagged total assets (–)
$RUNITS_i$ = Number of reporting units among which the opening balance of goodwill is split or number of operating segments if data on reporting units are not disclosed (+)
$ROE1_i$ = Return-on-equity for the year preceding the adoption of Section 3062 (–)
$ROE3_i$ = Annualized return-on-equity for the third and second year preceding the adoption of Section 3062 (–)
$CDEBT_i$ = Percentage of acquisitions financed entirely with cash and/or debt in the five year period preceding the adoption of Section 3062 (–)
$DEVROE_i$ = 1 if pre-TGIL adoption year ROE is lower than industry median, 0 otherwise (+)
$DEVROA_i$ = 1 if pre-TGIL adoption year ROA is lower than industry median, 0 otherwise (+)
$DEVLEV_i$ = 1 if pre-TGIL adoption year D/E is higher than industry median, 0 otherwise (–)
$CHANGE_i$ = 1 if there is a change of CEO in the year preceding or the year of adoption of Section 3062, 0 otherwise (+)
$PERBONUS_i$ = Average percentage of top paid executives' compensation paid in bonus for the adoption year (+)
$ITMEXERC_i$ = Average value of "in the money" exercisable stock options for the top paid executives as at the adoption year year-end divided by their total annual compensation for that same year (–)
$FIN_i$ = 1 if the firm raised new debt or equity capital in the year following the announcement of the transitional impairment test being completed, 0 otherwise (–)
$CLIST_i$ = 1 if the firm is cross-listed in the United States, 0 otherwise (–)
$AC_i$ = Proportion of financially literate and independent directors on the audit committee in 2002 (?)
$OWN_i$ = 1 if no external shareholder controls more than 20 percent of outstanding votes (i.e., the firm is widely-held), 0 otherwise (?)
$SIZE_i$ = Natural logarithm of lagged total assets (?)
$IND_i$ = Industry dummies, from 1 to 10 based on TSX Indices

# *Appendix 8*

Elliott and Shaw (1988, pp. 106) use the following model in their research:

$$y_i = \beta_0 + \beta_1 x_{1,i} + \beta_2 x_{2,i} + \sum_{j=3}^{7} \beta_j x_{j,i} + u_i$$

$y_i$ = two-day industry-adjusted return for firm i ending on the day the write-off was first published in the WSJ.

$x_{1,I}$ = the after-tax write-off scaled by share price for firm i.

$x_{2,I}$ = unexpected earnings scaled by share price for the ith firm.

$x_{j,i}$ = one of five (0, 1) dummy variables for the ith firm.

$x_3$ = bad news (1 = bad news).

$x_4$ = stock repurchase (1 = repurchase).

$x_5$ = write-off type (0 = write-down; 1 = reorganization).

$x_6$ = management change (1 = new management).

$x_7$= recurring write-off (1 = write-off follows a write-off in prior year).

# *Appendix 9*

Li et al. (2005) use the following models in their research:

***Model 1***

To test whether the market reacts negatively to the announcement of goodwill impairment losses, they estimate the following cross-sectional regression (pp. 17-18):

$$\mathbf{AR_i = \alpha_0 + \alpha_1 ILOSS_i + \alpha_2 UE_i + \varepsilon_i}$$

$AR_i$ = 3-day (-1, 0, +1) abnormal returns of firm i centered on the loss announcement date
$ILOSS_i$ = Per share (after-tax) transition goodwill impairment loss of firm i announced on date t, scaled by the closing price on date t-2, Pt-2
$UE_i$ = Unexpected earnings per share of firm i for the latest fiscal quarter whose earnings announcement date precedes or coincides with the loss announcement window, scaled by Pt-2

***Model 2***

To test whether the market anticipated the impairment in the value of goodwill prior to the official announcement by the company, they estimate the following regression (pp. 20):

$$\mathbf{R_{it-\tau,t-1} = \gamma_0 + \gamma_1 ILOSS_{it} + \gamma_2 E_{it-\tau,t-1} + u_{it-\tau,t-1} \qquad (\tau = 4, 8)}$$

$R_{it-\tau,t-1}$ = Returns of firm *i* over quarters (*t*-τ) to (*t-1*) relative to the announcement quarter *t*,τ = 4, 8
$ILOSS_{it}$ = Per share (after-tax) transition goodwill impairment loss of firm *i* announced in quarter *t*, scaled by price at the beginning of quarter *t*-τ
$E_{it-\tau,t-1}$ = Sum of EPS of firm *i* over quarters (*t*-τ) to (*t-1*) relative to the announcement quarter *t*, scaled by price at the beginning of quarter *t*-τ

# *Appendix 10*

Hayn and Hughes (2006, pp. 236-237) use the following model in their research:

$$\textbf{WRITE-OFF}_{it} = \alpha + \beta_1\textbf{PREM}_{iA} + \beta_2\textbf{BID}_{iA} + \beta_3\textbf{GW\%}_{iA} + \beta_4\textbf{STOCK}_{iA} + \beta_5\textbf{ANNRET}_{iA} + \beta_6\textbf{ACQN}_{iA} + \beta_7\textbf{ROA}_{in} + \beta_8\Delta\textbf{ROA}_{in} + \beta_9\textbf{LOSS}_{in} + \beta_{10}\Delta\textbf{SALES}_{in} + \beta_{11}\Delta\textbf{COMP}_{in} + \beta_{12}\textbf{FIRMROA}_{in} + \beta_{13}\textbf{FIRMRET}_{in} + \varepsilon_{it}$$

*i* = the firm-specific

*t* = time subscripts

*A* = the acquisition year in which the goodwill was created

*n* = the individual year in the time period from the acquisition year to the write-off year

*WRITE-OFF* = a dichotomous variable that receives the value of 1 if the goodwill arising from the acquisition is written-off in year t and 0 otherwise

*PREM* = payment of a significant premium as the extent to which the acquisition cost, measured as the acquisition price plus the assumed liabilities, exceeds the average market value of the acquired firm over the preannouncement period

*BID* = the number of bidders which is represented by a dummy variable that receives the value of 1 if more than one bidder is present during the acquisition period and 0 otherwise

*GW%* = the percentage of the acquisition cost assigned to goodwill

*STOCK* = an overpricing indicator, defined as the proportion of the purchase price paid for with the acquiring firm's stock and ranges from 0 to 1, with 0 representing an all-cash transaction and 1 denoting a pure stock transaction

*ANNRET* = the announcement period returns, measure as the cumulative abnormal returns accruing to the acquiring firm's stockholders over the twenty-one-day period beginning fifteen days before the acquisition announcement and ending five days following the announcement date

*ACQN* = Acquisition activity is measured as the number of acquisitions made by the acquiring firm over the two years preceding and the year of the acquisition announcement year.

*ROA* = operating income-to-identifiable assets

*ΔROA*= a change in ROA from one year to the next

*LOSS* = operating losses; a dummy variable coded as 1 if operating income is negative, 0 otherwise

*ΔSALES* = the percentage change in sales from one year to the next

*ΔCOMP* = a measure of the change in the competitive environment in which the segment operates, using the Herfindahl index to estimate changes in the level of competition of the reporting unit (see Rhoades [1993]; Harris [1998])

*FIRMROA* = the annual firm-level return on assets

*FIRMRET* = the annual cumulative abnormal returns of the firm over the years preceding the write-off

## *Appendix 11: Overview of important literature regarding earnings management*

| *Author (year of publication)* | *Research question* | *Research method* | *Sample* | *Research findings* |
|---|---|---|---|---|
| Watts and Zimmerman (1978) | Large firms which experience reduced earnings due to changes in accounting standards favour these changes. | Regression analysis | 133 accounting firms, public corporations, industry organizations and goverment agencies that filed written comments to the FASB memorandum 'Reporting the Effects of General Price-Level Changes in Financial Statements'. | Expectations are confirmed that large firms which experience reduced earnings due to changes in accounting standards indeed favour these changes. |
| Healy (1985) | Do executives rewarded by bonus schemes select income-increasing accounting procedures to maximize their bonus compensation? | Two methods are used: analyzing the accruals of the firm and investigating changes in accounting methods. | 94 companies listed on the 1980 Fortune Directory. | First manager's accrual policies are related to income-reporting incentives of their bonus contracts. Secondly changes in accounting procedures by managers are associated with the adoption or modification of their bonus plan. |
| Guidry, Leone and Rock (1999) | Do managers make discretionary accrual decisions to maximize their short-term bonuses? | Three methods are used: the modified Jones model, Healy's proxy for discretionary accruals and an inventory reserve measure. | 179 business-unit years for the time period 1994-1995. | U.S. business-unit managers of a multinational conglomerate manage earnings to maximize their short-term bonuses in a manner consistent with Healy (1985). |
| DeFond and Park (1997) | Does concern about job security create an incentive for managers to smooth earnings in consideration of both current and future relative performance? | A variation of the Jones model. | All available observations on the 1994 Compustat Industrial. | Eighty-nine percent of the observations that are predicted to smooth earnings actually act consistently with the expectation. |

## *Appendix 11 - Part 2*

| *Author (year of publication)* | *Research question* | *Research method* | *Sample* | *Research findings* |
|---|---|---|---|---|
| Peek (2004) | Did Dutch firms during the 1990's use the accounting discretion firms have in recognizing and reporting provisions to manage their earnings? | Descriptive statistics, a regression equation, a regression model and diagnostic test | 134 non-financial firms listed on the Amsterdam Stock Exchange between 1989 and 2000 for at least three years. | Firms with high current income report unexpectedly positive changes in provisions, if current income of firms is lower than the income of the previous year, the use of unexpected changes in provisions are a benchmark for a firm's future results. |
| Barth, Elliot and Finn (1999) | Do firms with patterns of increasing earnings have higher price-earnings multiples than other firms? | The models of Miller and Modigliani (1966) and Ohlson (1995). | All firms on Compustat for the period 1982 till 1992. | If a firm has a pattern of increasing earnings, the earnings multiple will be significantly higher than for firms without a pattern of increasing earnings. If the pattern is broken however, the earnings multiple will reduce significantly. |
| Tucker and Zarowin (2006) | Can income smoothing be associated with improving earnings informativeness? | The Cross-sectional version of the Jones model, as modified by Kothari et al. Secondly Tucker and Zarowin modified the model themselves. | 2004 version of Compustat's combined industrial annual data file over the period 1993-2000, excluding the financial and regulated industries. | The stock price of a high-smoothing firm impounds future earnings more than stock prices do at low-smoothing firms. |

## *Appendix 12: Overview of important literature regarding the link between earnings management and goodwill impairments*

| *Author (year of publication)* | *Research question* | *Research method* | *Sample* | *Research findings* |
|---|---|---|---|---|
| Zucca and Campbell (1992) | What are the consequences of write-downs? How do they affect stock prices and the financial health of the firms? | A comparison is made between a measure of expected earnings and reported earnings in the period a write-down was recorded. (Information content study) | 77 write-downs taken by 67 firms selected from NAARS in the period 1978-1983. | Evidence of both big bath accounting and income smoothing.<br>No significant market reaction to the write-off announcement. |
| Van de Poel, Maijoor and Vanstraelen (2008) | H1a: Firms are more likely to take a goodwill impairment when their earnings are 'unexpectedly' low (H1b: high), c.p. | Regression analysis | Listed companies in 15 EU countries preparing financial statements under IFRS in the period 2005-2006. | Companies typically take their impairments when earnings are 'unexpectedly' high (smoothing) or when they are 'unexpectedly' low (big bath). |
| Francis, Hanna and Vincent (1996) | Which of these 2 factors (manipulation or impairment) drives write-off decisions and do market reactions to these write-offs depend on these factors? | Multivariate analysis based on a weighted tobit model | 3909 potential write-off announcements published by PR Newswire between January 1st 1989 and December 31st 1992. | For the full sample of write-offs, both manipulation and impairment are important determinants, but incentives play a substantial role in explaining such items as goodwill write-offs. |
| Beatty and Weber (2006) | What factors affect the decision to take a write-off and, conditional on taking a write-off, what is the percentage of the goodwill that is actually written off? | Regression analysis | 867 firms from Compustat that are relatively more likely to take a goodwill write-off | 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. |

## *Appendix 12 - Part 2*

| *Author (year of publication)* | *Research question* | *Research method* | *Sample* | *Research findings* |
|---|---|---|---|---|
| Henning, Shaw and Stock (2004) | Has US GAAP given firms too much discretion in determining the amount and timing of goodwill write-offs? | Regression analysis | All (1576) firms in the Compustat (1, 2, 3 and full coverage) annual industrial file reporting goodwill on their balance sheets in the period 1990-1994. | US firm goodwill write-offs exceed the amounts predicted by the models, but not when considering changes in the value of goodwill after the acquisition.<br>Also, US firms delayed the income-reducing effects of the write-offs. |
| Masters-Stout, Costigan and Lovata (2007) | H1: Newer CEOs impair more goodwill than their senior counterparts | Regression analysis | Forbes magazine's list of CEOs for the 500 biggest companies in the period 2004-2006 | Compelling evidence that new CEOs impair more goodwill than their senior counterparts. |
| Strong and Meyer (1987) | What are the determinants of writedowns? | Multiple discriminant analysis using a paired case control sample | 120 firms which announced impairments in the period 1981-1985 (from The Wall Street Journal Index, The New York Times Index and the Disclosure database). | The most important determinant of a writedown decision proved to be a change in senior management; this is especially true if the new chief executive comes from outside the company. |
| Lapointe-Antunes, Cormier and Magnan (2008) | Are reporting incentives and constraints associated with the magnitude of transitional goodwill impairment losses reported by Canadian firms? | Multivariate tobit model (testing 7 hypotheses) | All firms listed on the TSX that report under Canadian GAAP and have a positive goodwill balance at the year-end preceding the adoption of Section 3062. (Compustat) | The adoption of the impairment approach effectively triggered the recognition of large impairment losses for Canadian firms. Firms record higher transitional goodwill impairment losses to minimize the deviation from the industry median ROE and ROA as well as when they experience a change in CEO. |

## *Appendix 12 - Part 3*

| *Author (year of publication)* | *Research question* | *Research method* | *Sample* | *Research findings* |
|---|---|---|---|---|
| Elliott and Shaw (1988) | H1a: Disclosure reveals a situation which is worse than expected by investors→ declining share prices<br>H1b: Positive returns because write-offs indicate proper responses to existing problems. | Regression analysis | 240 of the 305 firms are used that reported discretionary write-offs equal to at least 1% of assets during the years 1982-1985. (Industrial Compustat Tape) | Firms announced an above-average number of dividend decreases and sustained more frequent bond-rating decreases throughout the investigated period compared to other industrial firms. This is consistent with the negative stock performance during the period and indicates that the write-offs occur during a period of sustained economic difficulty. |
| Li, Shroff and Venkataraman (2005) | H1a: Market reaction to impairment announcement is negative and significant<br>H2: Magnitude impairment loss negatively correlated with returns<br>H3d: Impairment loss is positively correlated with indicators of overpayment for the acquisition and negatively correlated with post-acquisition performance of acquirer. | Regression analysis | 385 announcements of transition goodwill impairment losses made by US firms from January 2002 to December 2003 in the Lexis-Nexis database. | Relative to a control sample of acquirers, they find that firms announcing impairments are more likely to have overpaid for the target acquisitions made during the prior 5 years.<br>Also the impairment loss is positively correlated with indicators of initial overpayment and negatively correlated with the firms' post-acquisition return performance. |
| Hayn and Hughes (2006) | H1 The acquisition characteristics, as well as the subsequent financial performance of acquired businesses, are useful in predicting goodwill write-offs. | Prediction (regression) model | 3428 acquisitions from the Securities Data Corporation (SDC) database in the period 1988 to 1998. | On average, there exists a time lag of 3 to 4 years between the deterioration in the performance of the acquired business that gave rise to the goodwill and the actual write-down of that goodwill. |

# *Appendix 13*

**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). |
| $\Delta OCF_{it}$ | 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 14*

## Overview of used data

| *Name/code of data* | *Name of variable(s) in the model* | *Description of data* |
|---|---|---|
| *Thomson One Banker / Worldscope Fundamentals* | | |
| Impairment (WS.ImpairmentOfGoodwill) | $IMPAIRMENT_{it}$<br>$IMPAIR\_AMOUNT_{it}$<br>$SMOOTH2_{it}$ | No extra or explanatory definition given. |
| Total assets (WS.TotalAssets) | $IMPAIR\_AMOUNT_{it}$<br>$\Delta SALES_{it}$<br>$\Delta OCF_{it}$<br>$BATH_{it}$<br>$SMOOTH_{it}$<br>$BATH2_{it}$<br>$SMOOTH2_{it}$<br>$GOODWILL_{it}$<br>$SIZE_{it}$ | A firm's total assets are defined as: "*the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets*". |
| Return on assets (WS.ReturnOnAssets) | $\Delta indROA_{it}$ | The return on assets is described as a firm's net income before preferred dividends, plus "*the ((Interest Expense on Debt-Interest Capitalized) * (1-Tax Rate)) / Last Year's total assets * 100*" |
| Sales (WS.Sales) | $\Delta SALES_{it}$ | Sales are the sum of total sales in year t. |
| Cash flow (WS.CashFlow) | $\Delta OCF_{it}$ | Income before extraordinary items and preferred dividend plus depreciation and amortization expenses. |
| Net income (WS.NetIncome) | $BATH_{it}$<br>$SMOOTH_{it}$<br>$BATH2_{it}$<br>$SMOOTH2_{it}$ | A firms net income is the period income or loss a firm has presented, after subtracting all costs from all revenues. |
| Tax expenses (WS.IncomeTaxes) | $BATH_{it}$<br>$SMOOTH_{it}$<br>$BATH2_{it}$<br>$SMOOTH2_{it}$ | All income taxes levied on the income of a company by federal, state and foreign governments including: federal income taxes, state income taxes, foreign income taxes, charges lieu of income taxes, charges equivalent to investment tax credit and income taxes on dividends or earnings of unconsolidated subsidiaries or minority interest if reported before taxes. (Excludes: Domestic International Sales Corporation taxes, Ad Valorem taxes, Exice taxes, Windfall profit taxes, taxes other than income, general and services taxes) |
| Goodwill (WS.Goodwill) | $GOODWILL_{it}$ | Goodwill is the excess amount a firm has paid above the market value of an asset. This amount is included in intangible assets. |
| ICB industry division (WS.ICBIndustry) | $INDUSTRY_{it}$ | The Industrial Classification Benchmark Industry division that is based on the stock exchange markets in the US (Dow Jones) and UK (FTSE). |
| Big 4 auditor (WS.Auditor) | $BIG4_{it}$ | The names of the auditor have been reported here, but are manually divided into BIG 4 auditor or not. This distinction has been made based on the names of the audit firms. BIG 4 auditors are Ernst & Young, PriceWaterhouseCoopers, KPMG and Deloitte |
| *Company Info and company websites* | | |
| Annual reports | $CEO_{it}$<br>First-time adopters | - |

# *Appendix 15*

***Example of applying the developed models***

When applying the models developed in section 5.3, the data should be entered by first calculating the different variables in the way that was described in Table 3. To make more clear how the variables are determined, an example is provided here by using one firm-year observation from the sample.

The data of the firm *Imtech* and its industry (2000 Industrials) for the year 2007 are chosen to apply with the two developed models. There are several reasons why the choice has been made to illustrate the application of the model by using the data of this particular firm. The first reason is that Imtech is a company that has incurred goodwill impairment losses during the years 2005, 2006 and 2007. This information can be used to determine whether the company has used goodwill impairments to perform earnings management. Secondly there is a suspicion of earnings management because the firm's earnings, impairments and return on assets rise during these three years. It is therefore possible that the firm uses its goodwill impairments to smooth income. Another reason is that the firm is appointed to the industry 2000 Industrials. This industry contains the largest part of firm-year observations in the entire sample, more specifically 36.51%.

**Data Imtech 2006 and 2007**

| *Description* | *Value from database (in millions)* |
|---|---|
| Total assets 2007 | 1880.725 |
| Total assets 2006 | 1563.852 |
| Sales 2007 | 3340.804 |
| Sales 2006 | 2828.876 |
| Cash flow 2007 | 123.763 |
| Cash flow 2006 | 90.681 |
| Goodwill 1/1/2007 (=31/12/2006) | 198.266 |
| Impairment 2007 | 1.384 |
| Impairment 2006 | 1.185 |
| Net income 2007 | 91.930 |
| Net income 2006 | 67.662 |
| Taxes 2007 | 33.312 |
| Taxes 2006 | 41.183 |
| CEO change 2006/2007 | No |

In using the above depicted data of the 2007 firm-year observation for Imtech, the different variables can be determined as follows.

*GOODWILL*$_{it}$

This variable has been defined as the ratio of firm i's opening balance of goodwill on total assets. This indicates that the amount of goodwill on the opening balance of the firm's balance sheet should be deflated by total assets by using the following formula: Goodwill / Total assets

198.266 / 1563.852 = 0,12678… (≈12,678%)

*SIZE*$_{it}$

The size of the company is measured as the natural logarithm of firm i's total assets. This indicates that the data gathered should only be converted to natural logarithms. This is done as follows:

ln(TotalAssets) = ln(1880.725) = 7.5394…

*ΔSALES*$_{it}$

Regarding the variable *ΔSALES*$_{it}$ it is important to know how the change in sales is determined. This variable has been defined as the percentage change in firm i's sales from year t-1 to year t, which needs to be calculated as the absolute change in firm i's sales divided by total assets at the end of year t-1. This means that the following equation will be used:

(Sales 2007 – Sales 2006) / Total assets at the end of 2006 = Change in sales

(3340.804 – 2828.876) / 1563.852 = 0.3274… (≈32,74%)

*ΔindROA*$_{it}$

The return on assets (ROA) for the industry group 2000 Industrials in 2007 should be determined manually. This is done by taking the following steps:

- Step 1: Determine the total number of firm-year observations in this industry for 2007 and 2006
- Step 2: Calculate the sum of the ROAs for all firm-year observations in this industry for the years 2007 and 2006: 314.61 and 241.28 respectively.
- Step 3: Calculate the average ROA for the industry for both book years:
  - 2007 (t): 8.1115% / 2006 (t-1): 5.4997%
- Step 4: Calculate the percentage change in the industry ROA for this firm from year t-1 to year t:

  (ROA 2007 – ROA 2006) / ROA 2006 = %-change in industry ROA

  (8.1115% - 5.4997%) / 5.4997% = 0.4749… (≈47.49%)

*ΔOCF*$_{it}$

The variable *ΔOCF*$_{it}$ is calculated as 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. This means the following equation will be used:

(Cash flow 2007 – Cash flow 2006) / Total assets at the end of 2006 = Change in operating cash flows

(123.763 – 90.681) / 1563.852 = 0,02115… (≈2,115%)

*$CEO_{it}$*

A point of attention is that the data for a change in CEO is gathered manually based on information provided in the annual reports of the company. For Imtech, in the year under investigation (2007) as well as the year preceding the impairment (2006) no change in CEO has taken place. Therefore this variable will take the value 0 in this example.

*$BATH_{it}$, $BATH2_{it}$, $SMOOTH_{it}$ and $SMOOTH2_{it}$*

For the above mentioned variables the value of unexpected earnings needs to be calculated by using different equations for each variable.

The variable $BATH_{it}$ is determined based on the negative change in earnings before tax (=net income plus taxes at time t less net income plus taxes at time t-1, divided by total assets at time t-1).

[(Net income 2007 + Taxes 2007) – (Net income 2006 + Taxes 2006)] / Total assets at end of 2006

= [(91.930+33.312) – (67.662+41.183)] / 1563.852 = 0.0104…

This figure is then compared to the industry median of the change in earnings for only the negative values that is determined by using SPSS. When the negative change in earnings for a particular observation is lower than the industry median of non-zero negative values, this variable takes the value of 1. When the negative change in earnings is above this industry median, this variable takes the value of 0.

The variable $SMOOTH_{it}$ is determined in a similar way only then by focusing on only the positive changes in earnings. This means that when the positive change in earnings before tax (=net income plus taxes) for a particular observation is above the industry median of positive changes in earnings, this variable takes the value of 1. When the positive change in earnings is below the industry median, the variables takes the value of 0.

The variable $BATH2_{it}$ is determined as the value of the change in unexpected earnings, which is measured in a similar way as before. When the resulting amount is lower than 0, the variable now takes the value of unexpected earnings, so it is not compared to the industry median and not measured as a dummy variable that takes only the values 0 or 1. This variable is however measured as a semi-dummy variable since in the case that the resulting amount is zero or higher, the variable takes the value of 0.

Finally, the variable $SMOOTH2_{it}$ is determined as the value of the change in unexpected earnings (which is again measured as before) *less* the write-off (=impairment amount divided by total assets at t-1), when this resulting amount exceeds 0. When the resulting amount is zero or lower, the variable takes the value of 0.

[Net income 2007 + Taxes 2007 - Net income 2006 + Taxes 2006] / Total assets at end of 2006

-/- [Impairment 2007 / Total assets at the end of 2006]

= [(91.930+33.312) – (67.662+41.183) - 1.384] / 1563.852 = 0.00096…