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Master thesis

**Impairment of goodwill**

In relation to earnings management and the financial crisis

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# Preface

This thesis has been written as a part of the master’s program for the master in Accounting, Auditing and Control at the Erasmus University, Rotterdam.

Before presenting this thesis I especially want to express my gratitude to drs. R.D. Achaibersing RA, for giving guidance throughout the writing of this thesis. Because of his guidance and comments the quality of my thesis has improved. Secondly, I would like to thank my fellow students and friends M. van Wissen and J.L.P. van Emmerik MSc for their comments. Finally I would like to thank my girlfriend and parents for supporting and encouraging me throughout my study.

# Abstract

This research first discusses the concept of goodwill and the relating accounting standards. Then the practice of performing an impairment test of goodwill is discussed where it becomes apparent that the management has to make several assumptions to calculate the recoverable value which influences the impairment of the goodwill. This indicates that if the management has the proper incentives they could be tempted to make their assumptions more aggressive or conservative.

To make assumptions more aggressive or conservative indicates earnings management. The definitions and ranges of earnings management are discussed and the incentives which management can have are set out. Two types of earnings management are also discussed: big bath accounting and income smoothing. Big bath accounting is based on the fact that sometimes it can be better on the long run to make extra losses one year and take advantages of that in the following years. Income smoothing is to deliberate decrease fluctuations in the level of income.

The first two hypotheses are based on the combined effects of goodwill impairment losses and the types of earnings management. The first hypothesis states that Industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average and the second hypothesis states that Industrial firms are more likely to recognize a goodwill impairment loss when they perform above branch average.

The third factor that is considered in this thesis is the effect of the financial crisis. The financial crisis is expected to have a significant impact on the results of the first two hypotheses and therefore the research model has been performed on a year before and after the start of the crisis and lead to the third hypothesis: Due to the crisis the incentive for management to perform earnings management has increased.

The research model has been based on a multiple logistic regression model with a dummy for the dependent variable impairment of goodwill, two independent variables to indicate big bath accounting and income smoothing and three economic independent variables which indicate the economic performance of a company. Besides these variables there are also two control variables added to the model to control for the effect on the impairment decision caused by the relative size of goodwill compared to total assets and the size of the company’s assets.

To obtain proper research samples with comparable data the sample exists only out of listed industrial production companies and based within member countries of the European Union in 2007 and 2009, with respectively 767 and 826 companies. On these research samples statistical regression analyses are performed in chapter 7.

The conclusion of these regression analyses are stated in chapter 8. For both years, 2007 and 2009, there is significant evidence that industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average. This is in line with expectations based on big bath accounting.

There is no significant evidence however that the industrial firms which are performing above branch average are more likely to recognize a goodwill impairment loss.

It was expected that the financial crisis would increase the effect of earnings management, if first proven by the hypotheses 1 and 2. However, although for both years significant evidence was found that industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average, it was found that the significance and effect of the year 2009, the year after the crisis begun, was less than the year before the crisis. This indicates that the crisis weakened the significance and effect.

For neither year of the second hypothesis significant evidence was obtained that the industrial firms which are performing above branch average are more likely to recognize a goodwill impairment loss. No supporting evidence for an increased effect due to the crisis was noted.

Based on these results no significant evidence is found that the crisis increased the incentive of management to make the decision to perform earnings management. This is an interesting and relevant outcome because this indicates that due to the crisis the impairment of goodwill and therefore, the financial statements were not influenced by earnings management more than before the crisis.

# Table of Contents

[1. Introduction 7](#_Toc359957122)

[1.1 Research question 8](#_Toc359957123)

[1.2 Expectations 8](#_Toc359957124)

[1.3 Limitations 10](#_Toc359957125)

[2. Goodwill and related accounting standards. 11](#_Toc359957126)

[2.1 Business combinations. 11](#_Toc359957127)

[2.2 On balance goodwill. 12](#_Toc359957128)

[2.3 Relevant accounting standards. 13](#_Toc359957129)

[2.3.1 Implementation of IFRS in the European Union 13](#_Toc359957130)

[2.3.2 International Financial Reporting Standards 3 14](#_Toc359957131)

[2.3.3 Statement of Financial Accounting Standards (SFAS) 142. 15](#_Toc359957132)

[2.3.4 Differences between IFRS and SFAS 16](#_Toc359957133)

[2.4 Summary and Conclusion 16](#_Toc359957134)

[3. Goodwill Impairment 18](#_Toc359957135)

[3.1 Impairment test conform IAS 36 18](#_Toc359957136)

[3.2 Impairment test and Earnings Management 19](#_Toc359957137)

[3.3 Summary and conclusion 20](#_Toc359957138)

[4. Earnings Management 21](#_Toc359957139)

[4.1 Definition of earnings management 21](#_Toc359957140)

[4.2 Incentives for earnings management 23](#_Toc359957141)

[4.3 Types of earnings management 25](#_Toc359957142)

[4.3.1 Taking a bath 25](#_Toc359957143)

[4.3.2 Income smoothing 26](#_Toc359957144)

[4.4 Summary and Conclusion 27](#_Toc359957145)

[5. Research design 28](#_Toc359957146)

[5.1 Development of Hypotheses 28](#_Toc359957147)

[5.2 Development of Model 30](#_Toc359957148)

[5.2.1 Types of Variables 30](#_Toc359957149)

[5.2.2 Research variables 32](#_Toc359957150)

[5.3 Conclusion of research model 34](#_Toc359957151)

[5.4 Research sample 35](#_Toc359957152)

[5.5 Summary and Conclusion 37](#_Toc359957153)

[6. Descriptive statistics 38](#_Toc359957154)

[6.1 Descriptive statistics 38](#_Toc359957155)

[6.2 Power and significance 40](#_Toc359957156)

[6.3 Multicollinearity 41](#_Toc359957157)

[6.4 Summary and conclusion 42](#_Toc359957158)

[7. Results and Analysis 43](#_Toc359957159)

[7.1 Regression analysis 2007 43](#_Toc359957160)

[7.2 Regression analysis 2009 45](#_Toc359957161)

[7.3 Effects of the crisis 46](#_Toc359957162)

[8. Conclusion 47](#_Toc359957163)

[8.1 Conclusion 47](#_Toc359957164)

[8.2 Future research 48](#_Toc359957165)

[References 50](#_Toc359957166)

[Appendix 52](#_Toc359957167)

[1. Use of options in the IAS Regulation by Member States 53](#_Toc359957168)

[2. Theoretical outcomes: 54](#_Toc359957169)

[3. Model as used by van the Poel et al. (2008): 56](#_Toc359957170)

[4. Box plots: 57](#_Toc359957171)

[5. Used Data: 62](#_Toc359957172)

# Introduction

This thesis is written to investigate the combined effects of three different factors on each other:

1. Impairment of goodwill.

Impairment of goodwill has been subjected to research many times before. This has several reasons. Partially this is caused by the nature of the goodwill. For the impairment of goodwill assumptions have to be made. These assumptions give the management an opportunity to perform earnings management. Besides the nature, the impact of impairing goodwill can be significant to the balance sheet and income statement of a company. Alciatore et al. (1998) noted that the mean amount of impairments of the firms in their research ranged from four to more than nineteen percent of the assets. The maximum impairment found represented ninety percent of the firm’s assets.

1. Earnings management.

High quality accounting standards do not immediately mean high quality financial reporting. As Arthur Levitt, former Chairman of the Security and Exchange Commission said in his speech at the NYU Center for Law and Business: "...Well, today, I'd like to talk to you about another widespread, but too little challenged custom: earnings management. This process has evolved over the years into what can best be characterized as a game among market participants. Increasingly, I have become concerned that the motivation to meet Wall Street earnings expectations may be overriding common sense business practices. Too many corporate managers, auditors, and analysts are participants in a game of nods and winks. In the zeal to satisfy consensus earnings estimates and project a smooth earnings path, wishful thinking may be winning the day over faithful representation.” Although this speech was held in 1998 it accurately describes the core of earnings management. Listed entities can feel pressure to meet expectations from investors and to conceal the actual firm performance from outsiders.

1. The financial crisis.

In 2007 the economic growth in the Netherlands remained 3,5% but came to a grinding halt in the second quarter of 2008 (Masselink and Noord, 2009). This effect has been seen throughout Europe. The Annual Report on the Euro Area – 2009, by the Directorate-General for Economic and Financial Affairs of the European Commission states that the global and financial economic crisis sprang up in the second half of 2008. It originated in the US subprime mortgage market during the summer of 2007 and intensified in September 2008. The effects of the financial market turmoil on the ‘real’ economy were noted in worsening financing conditions and confidence effects. Banks tightened their lending conditions which also was a result of the filing for bankruptcy of the financial services firm Lehman Brothers in September 2008. The real effect of the crisis was noted in the fourth quarter of 2008 when GDP in the Economic and Monetary Union dropped with 1,8% which was the biggest decrease since the start of the Economic and Monetary Union.

## 1.1 Research question

The combination of the above three factors will be researched, and leads to the following central research question:

***Is there a relation between performing impairment of goodwill and earnings management and did the financial crisis impact this relation?***

To give an answer to this research question it has been divided into three sub questions:

* *Is there a relation between companies performing below branch average and higher incentive for earnings management in the form of big bath accounting through impairment of goodwill?*
* *Is there a relation between companies performing above branch average and higher incentive for earnings management in the form of income smoothing through impairment of goodwill?*
* *Does the financial crisis increase the significance of the effects seen in the research performed on the questions stated above?*

Each sub question exists out of several different elements. To give a proper answer to the central research question, these elements will be researched through literature research and empirical research. The literature research will first focus on goodwill in chapter 2. The researched areas are: What are the advantages for a company to merge with another company? What are business combinations and when does a business combination result in goodwill? What do accounting standards say about the financial accounting and reporting concerning goodwill, and why have these specific standards been published?

After the theoretical research on goodwill, the research will focus on impairment of goodwill in chapter 3. How is an impairment test performed and which estimates are used in an impairment test? These estimates lead to the following theoretical research chapter; earnings management in chapter 4. In this chapter the following questions will be researched: What is earnings management? Which incentives does the management have to perform earnings management? And what are big bath accounting and income smoothing?

The central research question, the sub questions and the theoretical research lead to the hypotheses, the multiple logistic regression model and the research sample which will be discussed in chapter 5. Based thereon the empirical research will be performed starting with the descriptive statistics in chapter 6 and the regression analysis in chapter 7. To finalize the research the conclusion will be drawn in chapter 8.

## 1.2 Expectations

This subchapter will state the expectations for the research sub questions as described in the previous subchapter, based on previous research.

It is expected that there is a relation between companies performing below branch average and applying earnings management in the form of big bath accounting through impairment of goodwill based on research of Hayn and Hughes (2006), they state that the timing of goodwill write-offs can lag behind the economic impairment of goodwill. Henning et al. (2004) found a comparable result from their research. They discovered that firms delay goodwill write-offs strategically for a certain period, when they know that their ratios are being scrutinized more securely by their shareholders. These researches support the idea that the management takes goodwill write-offs when it suits them the best, for example in a year where big bath accounting can be exploited.

These results, that management takes goodwill write-offs when it suits them, also indicates a relation between companies performing above branch average and earnings management in the form of income smoothing through impairment of goodwill. According to Fudenberg and Tirole (1995) the reason managers perform income smoothing is because they are afraid to lose their jobs. Their theory is based on the presumption that if a company has had a bad year the management has bigger chances of getting fired and when there is a good year, it does not secure the manager’s position for the coming years. This gives managers the incentive to perform income smoothing. Han and Wang (1998) support this statement; in their research they found that oil firms which expected to profit from the Persian Gulf crisis used earnings management to reduce their quarterly reported earnings. They state that the oil firms did this because the positive effect generated by reporting good news, i.e., a higher amount of earnings, is outweighed by the negative effect of political sensitivity and associated costs.

Although research on the impact of the financial crisis on earnings management through impairment of goodwill is limited, based on the study of Sevin and Schroeder (2005) relating to earnings management an expectation can be formed on the effects of the financial crisis on earnings management through impairment of goodwill. Sevin and Schroeder (2005) stated that the adoption of SFAS 142 had the effect on companies that they engaged in earnings management. They found that a significantly greater part of firms indeed reported negative earnings in the year of SFAS 142 adoption. This is an interesting result and it would indicate that managers are more likely to perform earnings management when there are external factors which give them an opportunity to get away with less positive results than normal. This is also shown through the political cost hypothesis and income smoothing. The political cost hypothesis states that companies which are bigger than other companies are more likely to use earnings management to weaken their results because they will gather more attention from the government once they are large (high earning) companies (Watts and Zimmermann, 1986). Because of the crisis, companies who are doing good will stand out even more and will have more incentive to weaken their results. Next to this, when a company has got a good year, the management is more inclined to make larger impairments so that they do not have to make these impairments in the coming years when the performance of the company could be getting dissatisfactory.

Therefore the financial crisis provides a unique opportunity to assess if impairment of goodwill is used for earnings management. This unique opportunity is caused by the financial crisis because management needs incentives and opportunities to perform earnings management and it is expected that the financial crisis increases these incentives and opportunities.

##  1.3 Limitations

In this subchapter the limitations of this thesis will be discussed. Relating to the internal validity of the research model, several economic and control variables are incorporated in the research model to get the best results as possible and to ascertain that the changes in the dependent variable are certain to be caused by the independent variable. However, as the impairment of goodwill can be influenced by more external factors for which cannot be controlled, this is a limitation of the research. An example of such a factor can be an earthquake that destroys a cash generating unit after which it’s relating goodwill is impaired to € 0,-.

The population which is used to perform the empirical research was taken from the years 2007 and 2009, refer to subchapter 5.4 Research sample. There are several reasons why the years before 2007 and after 2009 are not included in the research. The first reason is that the population in these years exist out of 767 companies in 2007 and 826 companies in 2009. These populations therefore provide a very good basis for a statistical regression analysis. Besides this, refer to chapter 2.3 Relevant accounting standards, the International Financial Reporting Standards was made mandatory for listed companies in the European Union per January 2005. Pownall and Wieczynska, 2012, note that the IFRS regulation came into effect in 2005 and in 2007 most exemptions and deferrals from IFRS adoption expired. Therefore, seen as the population of 2007 is large enough for regression analysis, the results are more precise then when 2006 is also incorporated in the regression analysis.

Relating to external validity, the research focusses on industrial companies inside countries of the European Union which report based on IFRS. Therefore generalization of the results to other industries cannot be made. But due to the further adoption of IFRS throughout the world the results of this study could be used when assessing the financial statements of an industrial company outside of the European Union, which is reporting under IFRS, and operates in a comparable situation as industrial companies inside the European Union.

# Goodwill and related accounting standards.

To be able to make a relation between goodwill, earnings management and the financial crisis, it is important to get a good understanding of goodwill. This chapter will give an answer to the following questions: What are the advantages for a company to merge with another company? What are business combinations and when does a business combination result in goodwill? What do accounting standards say about the financial accounting and reporting concerning goodwill, and why have these specific standards been published? By answering these questions this chapter will set out the foundation for this thesis.

## 2.1 Business combinations.

Goodwill is a possible result of a business merger. There are a lot of reasons why entities could choose to merge with another entity. The most important reasons all have to do with the fact that entities want to create new economic value for the shareholders. Palepu et al. (2007) mention the following ways in which value can be created:

1. Let the target management perform better by letting the management follow the same line as the overtaking entity.
2. Capturing tax benefits by being able to utilize a carry forward option.
3. Taking advantage of economies of scale, for example through combining research facilities.
4. Becoming a more dominant firm to take out competitors and increasing product-market rents.

Once an entity has decided it wants a merger with another entity, they have to look at the best way to make this happen. Business combinations occur in several different forms. The three main ways resulting in a business combination are:

1. The company merger

If an entity buys all the assets and liabilities of another entity, then it is called a company merger.

1. The stock merger

A merger is a stock merger when an entity buys the majority of the shares of another entity or if a third company is created where the majority of the shares of the merging companies are brought in.

1. The legal merger

When the two merging entities cease to exist and the shareholders of the merging entities become automatically the shareholders of the new entity the merger is called a legal merger.

Each of these methods results in a business combination. Seen from the perspective of the relationship between the two companies that are merging the merger can also be qualified in the following five ways:

1. Horizontal; merging competitors.
2. Vertical; for example a visor supplier and a helmet factory.
3. Market-extension; two merging entities with the same products but in different markets.
4. Product-extension; two merging entities in the same market and with related but different products.
5. Conglomeration; merging of two entities who have no common business areas.

All possibilities together give a lot of different reasons and ways for a company to merge with another. But every option leads to the possibility of bringing goodwill in existence on the balance sheet of the acquirer. In the following subchapter there will be explained how this business combination leads to on balance goodwill.

##

## 2.2 On balance goodwill.

Seen from an accounting perspective, goodwill is part of the costs of a business combination and is the premium an entity pays above the book value of the entity when it is acquired. Henning et al. (2000) mention that this accounting goodwill can be divided in four elements:

1. Write-up goodwill is the goodwill for the revaluation of assets to fair value. Calculated as the difference between the preacquisition book value of the targets firms assets and their fair market value. This is part of the equity after purchase price allocation.
2. Going-concern goodwill is the goodwill attributed to the acquired company as an independent entity from a going concern perspective. The going-concern goodwill is calculated as the difference between the targets market value six days before the acquisition and the fair market value of the assets after the acquisition.
3. Synergy goodwill is the expected value creation from the acquisition on itself. This is calculated by taking the cumulative abnormal returns for the acquirer and the target entity in the eleven days after the announcement of the takeover.
4. Residual goodwill is the remaining surplus that has been paid for the entity. Calculated as the purchase price minus the preacquisition book value of the assets and the 3 points above.

## 2.3 Relevant accounting standards.

This subchapter will explain the rules and regulations related to financial accounting and reporting concerning goodwill. The empirical research will focus on industrial businesses in the Euro zone which are listed on a stock market, refer to subchapter 5.4 research sample. Since the first of January 2005 it is mandatory for all listed companies inside the European Union to switch from reporting, based on their own country’s Generally Accepted Accounting Standards (GAAP), to the International Financial Reporting Standards (IFRS). This regulation has been implemented to increase comparability of financial statements between European countries. The first subchapter will discuss the implementation of IFRS. After this, IFRS 3 *Business Combinations* will be discussed.

Besides the IFRS, which are published by the International Accounting Standards Board (IASB), the Generally Accepted Accounting Standards of the United States of America (US-GAAP) will also be discussed. The US-GAAP has been published in the Statements of Financial Accountings Standards (SFAS). The US-GAAP will be discussed so that it is possible to compare the IFRS to another standard.

IFRS and SFAS will then be scrutinized for their views on the presentation of goodwill and differences between them will be set out.

### 2.3.1 Implementation of IFRS in the European Union

Since 2005 the European Union made the IFRS mandatory for all firms which were quoted on a European stock exchange. For these firms their consolidated financial statements had to be prepared based on the IFRS. In the Netherlands the government allows companies to arrange their separate financial statements also conform the IFRS to enhance the comparability and transparency. Entities who are not quoted on the stock exchange are also allowed to use the IFRS for separate and consolidated financial statements instead of the ‘Titel 9 boek 2’ and ‘Richtlijnen voor de Jaarverslaggeving (RJ)’ which used to be the only option before the adoption of the IFRS.

If companies in the Netherlands use the IFRS for their consolidated financial statements they are also allowed to only use the valuation principles of their consolidated statements besides the ‘Titel 9 boek 2’ and RJ in their separate statements.

See the table below for an oversight of the options companies have in the Netherlands, concerning the choice for reporting regulations. (Eynde, 2007)

|  |  |  |
| --- | --- | --- |
|  | Stock exchange | Not quoted on stock exchange |
| Consolidated financial statements | IFRS | IFRS / Titel 9 boek 2 and RJ |
| Separate financial statements | IFRS / Titel 9 boek 2 and RJ | IFRS / Titel 9 boek 2 and RJ / Title 9 boek 2 and RJ + valuation principles IFRS |

There are multiple differences between the IFRS and ‘Titel 9 boek 2’. The difference relating to the valuation of goodwill is that the IFRS use impairment of goodwill instead of depreciation in a maximum of twenty years, as prescribed by ‘Titel 9 boek 2’.

Each country in the European Union has differences between consolidated financial statements and separate financial statements of the legal entity. For an overview of the use of options in the IAS regulations per member state of the European Union, refer to Appendix 1. Use of options in the IAS Regulation by Member States.
In this overview it becomes apparent that IFRS is required for all consolidated financial statements of industrial companies and it is not required for all statutory accounts. To gain comparable data, the data used for this thesis will therefore be based on consolidated financial statements.

### 2.3.2 International Financial Reporting Standards 3

The objective of IFRS 3 *Business Combinations*, is to give companies guidelines in the financial reporting of their business combination and it’s relating consolidation. This is established by giving guidelines and requirements concerning the following points: First there are guidelines and requirements for an acquirer on how to recognise and valuate the identifiable assets acquired, the assumed liabilities and any non-controlling interest in the target. Secondly there are guidelines and requirements for an acquirer on how to recognize and measure the goodwill resulting from a business combination, or possible gain from a bargain purchase. Lastly, the IFRS 3 determines which information needs to be disclosed in order to enable the users of the financial statements to get a clear understanding of the nature of the business combination and which financial effects it has got.

For the second point, the recognition and measurement of goodwill the following is stated:

The acquirer shall recognize goodwill as of the acquisition date measured as the excess of (a) over (b) below:

(a) the aggregate of:

(i) the consideration transferred measured in accordance with this IFRS,

which generally requires acquisition-date fair value;

(ii) the amount of any non-controlling interest in the acquiree measured

in accordance with this IFRS; and

(iii) in a business combination achieved in stages, the acquisition-date fair value of the acquirer’s previously held equity interest in the acquiree.

(b) the net of the acquisition-date amounts of the identifiable assets acquired

and the liabilities assumed measured in accordance with IFRS.

This means that IFRS 3 *Business Combinations* requires goodwill that has been acquired in a business combination to be recognized by the acquirer from the acquisition date. Which will be initially measured as the excess of the cost of the business combination over the acquirer’s interest in the net fair value of the acquiree’s identifiable assets and liabilities recognized (IASC Foundation Education).

The first effective date of IFRS 3 was 31 March 2004. Per 10 January 2008 the revised IFRS was issued. Significant amendments to IFRS 3 (2008) relate to changes in step and partial acquisitions, the accounting of acquisition-related costs and guidance relating to changes in a parent’s ownerships interest in a subsidiary that do not result in the loss of control. As the press release of the IASB noted on 10 January 2008, the revised IFRS 3 took effect on reporting years started on or after 1 July 2009. Seen as the years for which the data are selected are 2007 and 2009, refer to chapter 5, the new IFRS 3 does not impact the comparability of the data.

Besides IFRS 3 *Business Combinations*, another important part of the IFRS concerning goodwill are the standards about the impairment test. These are stated in IAS 36 *Impairment of assets.* IAS 36 will be discussed in chapter 3, Goodwill Impairment.

### 2.3.3 Statement of Financial Accounting Standards (SFAS) 142.

In this subchapter there will be given a short explanatory view of SFAS 142, why it has been implemented and what SFAS 142 is about. Hereafter the differences with IFRS will be discussed.

SFAS 142, which addresses the financial accounting and reporting for acquired goodwill and other intangible assets, has been issued on June 2001 by the Financial Accounting Standards Board (FASB). The FASB issued SFAS 142 for several reasons: Firstly because they found that amortizations of goodwill and other intangible assets did not provide an accurate reflection of the value of goodwill and because intangible assets are increasingly important as economic resources for many entities. Besides these two reasons financial statement users indicated they found that goodwill amortization costs are not relevant for analysis of the financial statements.

SFAS 142 attends to the way intangible assets and goodwill, that are acquired by a group or individually, should be accounted for when they are acquired and after they have been initially recognized in the financial statements.

SFAS 142 lays the emphasis on the value of assets instead of expense recognition. This is in line with the ever growing emphasis that has been laid on fair value accounting by the FASB. Before the introduction of SFAS 142 goodwill would be amortized. But the FASB noted that amortization of goodwill does not reflect the economic change in value that the goodwill is going through. Thus SFAS 142 prescribes a non-amortization approach for goodwill and uses impairment instead. Hereby companies need to impair the on balance goodwill and adjust this balance as such.

Noted hereby that SFAS 142, just as IFRS 3, is a one way street. Once goodwill has been impaired to its fair value, it cannot increase in value the next year nor can there be made a provision for a possible recovery of value in a more favorable economic year. This has been done because of the insecurity in realizing the increase in value of the goodwill. This is also called the principle of realization (Mercer et al. 2002).

### 2.3.4 Differences between IFRS and SFAS

Because the IASB and FASB are working together a lot on published standards and principles the differences between them are decreasing. But even though business combinations are a subject of substantial convergence between the IASB and the FASB there are still some differences between the two reporting standards. When focusing on the standards concerning goodwill, the most important differences are:

Variable interest entities and qualified special purpose entities are not explicitly mentioned in IFRS even though their definitions and criteria for consolidation have been exhaustively discussed in US-GAAP. This is a result of the more principle based IFRS in comparison to the more rules based US-GAAP. Another difference is the fact that under IFRS it is also possible to account for interest in joint ventures through the proportionate consolidation method besides the equity method. This means that under IFRS the acquirer can consolidate the financial statement accounts in accordance with the interest that has been taken in a joint venture. (Langmead 2009)

## 2.4 Summary and Conclusion

This chapter discussed the origin of goodwill, starting at why business combinations exist. For example companies want to start a business combination because of economies of scale. This could mean that they have the possibility to cut costs because they can share the same back office. Besides the reasons for a business combination this chapter also discussed which business combinations there are possible and how business combination can come to existence. For example through a stock merger.

After the general points of business combinations were discussed this chapter looked further into the relevant accounting standards concerning goodwill. For the IFRS the most relevant accounting standards are IFRS 3 *Business Combinations*. Besides these standards the SFAS 142, which addresses the financial accounting and reporting for acquired goodwill and other intangible assets was also discussed and the differences between the two standards were summarized. This chapter focused mainly on the accounting standards which are relevant for goodwill. In the following chapter the more practical side of the rules and regulations as set by the IFRS concerning the impairment test are being discussed.

#  Goodwill Impairment

The previous chapter discussed the definition of goodwill and which accounting standards there are concerning goodwill. This chapter will examine the practice of performing an impairment test on goodwill conform the relevant accounting standard, IAS 36. After the impairment test has been explained the link with earnings management will also come to light.

## 3.1 Impairment test conform IAS 36

The purpose of the impairment test is to review the accuracy of valuation of capitalized goodwill. However, to perform an impairment test, many amounts need to be determined before an actual impairment calculation can be made. For example the recoverable amount, the value in use, the carrying amount and the fair value. Besides these amounts, performing an impairment test requires a thorough knowledge of tangible and intangible assets valuation methodology and purchase price allocation. This makes a goodwill impairment test very complicated and has caused a lot of discussion in the accounting world. (Seetharaman et al., 2006)

This subchapter will explain how the impairment test is performed conform the regulations of the IFRS, IAS 36. In IAS 36.96 it is stated that the goodwill has to be tested annually. To perform this annual impairment test the goodwill that has been acquired through a business combination has to be divided into cash-generating units or groups of cash-generating units which are expected to benefit from the synergy that the business combination delivers. These cash-generating units must not be bigger than an operating segment as defined in IFRS 8 Operating Segments and they have to represent the lowest level at which the management monitors goodwill for internal management purposes.

The IFRS uses a one step method for the impairment testing of goodwill. In this one step impairment test model the carrying amount of the cash generating unit is being compared with the recoverable amount (IAS 36.90). If the recoverable amount is lower than the carrying amount, this represents the impairment loss. The recoverable amount is identified as the fair value of the asset, minus the costs to sell or as the value of the asset in use. These concepts imply the following:

1. The fair value of the asset, minus the costs to sell.

The fair value is an exit price which is defined by the IFRS as follows: “The amount for which an asset could be exchanged, a liability settled, or an equity instrument granted could be exchanged, between knowledgeable, willing parties in an arm’s length transaction.” Important to notice is that this definition says, ‘could be exchanged’ so it assumes that the exchange transaction is hypothetical and ‘.. exchanged, between knowledgeable, willing parties in an arm’s length transaction’ means that the exchange has to be orderly (meaning that the transaction is not forced or has its origin in a distress sale). IFRS gives three options to find out what the fair value is of a cash-generating unit.

1. The first one is only possible if there is a binding sale agreement for that cash-generating unit. If there is a sale agreement then this price has to be taken less the costs to sell. (IAS 36.25)
2. The second option can be used if there is an active market for that type of cash-generating unit. Then the market price is the fair value. This market price means the current bid price if it is available or the price of the latest transaction that took place. (IAS 36.26)
3. If there is no sale agreement and there is also no active market then the best estimate of the cash-generating unit has to be taken, minus the costs to sell. (IAS 36.27)

The costs to sell are only the incremental costs directly attributable to the disposal of a cash-generating unit, excluding finance costs and income tax expense. This leaves costs like cleaning, transportation or dismantling.

To conclude, with the fair value of the asset, minus the costs to sell, is meant the amount that can be received from selling an asset or cash-generating unit between knowledgeable, willing parties in an arm’s length transaction less the costs of disposal.

1. The value of the asset in use.

The value of the asset in use means the value an asset has got, represented by future cash-flows, which are discounted to present value by using a market-determined rate. This market-determined rate reflects two different things. On one side it reflects the current assessment of the time value of money and on the other hand there is the risk specific to the asset for which the cash-flow estimates have not been adjusted.

From these two options the highest amount will be chosen, so if the fair value, minus the costs to sell is higher than the value of the asset in use, then the fair value, minus the costs to sell will be taken as the recoverable amount, which will then be compared to the carrying amount. IAS 36.105 states that the carrying amount should not be lower than the highest of the following three options: the fair value less costs to sell, the value in use and zero. Once the test has been performed and it is clear that the value of the goodwill has dropped, then conform IFRS 3, the impairment loss has to be recognized.

## 3.2 Impairment test and Earnings Management

As signaled in the previous subchapter fair value of an asset is the amount for which an asset could be exchanged, a liability settled, or an equity instrument granted could be exchanged, between knowledgeable, willing parties in an arm’s length transaction. IAS 36.28 states that if there is no active market then it has to be the best estimate of a hypothetical exchange. Besides this, the value of the asset in use is based on the following elements:

1. An estimate of future cash flows.
2. Expectations about possible variations there could be relating to the amount or timing of the estimates of cash flows.
3. And estimates that are being made for factors that buyers would reflect in their price for the cash-generating unit when they are buying it, like the costs for illiquidity.

This means that one way or another the chances are high that for the calculation of the recoverable amount there have to be made assumptions and estimates by the management. This gives the management the opportunity to perform earnings management.

## 3.3 Summary and conclusion

In this chapter the impairment test and fair value have been discussed. It became clear that not the entire amount of goodwill is tested but that the goodwill first is divided and then attributed to cash generating units. For the impairment test the recoverable value has to be calculated and compared to the carrying value. The calculation of this recoverable value is exposed to a lot of assumptions and through this the management has the possibility to perform earnings management. In the following chapter we will look further into the definition of earnings management, which incentives the management has got to perform earnings management and which forms of earnings management are being used.

# Earnings Management

In the financial statements, earnings is one of the most important items. The earnings show if the entity was able to add value with its activities in the preceding year. The accounting choices the management makes influence the amount of earnings on the financial statements. This is why the management needs to make the best accounting choices for their company. This is what earnings management is all about. In the first subchapter the definition of earnings management will be set out. The second subchapter will elucidate on which incentives the management has got for earnings management. The final subchapter will discuss two different types of earnings management.

## 4.1 Definition of earnings management

It is imperative to get a clear point of view on the definition of earnings management. Throughout the years many dissertations and books have been written about earnings management resulting in an immense range of perspectives and definitions. (Ronen and Yaari, 2008) distinguished several definitions to summarize the different points of view:

1. White definition: “Earnings management is taking advantage of the flexibility in the choice of accounting treatment to signal the managers private information on future cash flows”.
2. Gray definition: “Earnings management is choosing an accounting treatment that is either opportunistic (maximizing the utility of management only) or economically efficient”.
3. Black definition: “Earnings management is the practice of using tricks to misrepresent or reduce transparency of the financial reports.

Because so much has been written about earnings management from an accounting and an economic point of view, it is not possible to say, ‘these two definitions are wrong and this is the right one’. However, it is possible to select the best definition and the one that will be used in this thesis. Ronen and Yaari find that the definition as written by Healy and Wahlen from 1999 defines earnings management the best:

“Earnings management occurs when management uses judgment 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” (Healy and Wahlen, 1999, p. 368).

Although this is a clear and good definition of earnings management it does not mention that the management executes earnings management with the intent of obtaining private gains. Schipper (1989, p. 92) states as definition of earnings management:

“Earnings management is really disclosure management in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process).”

Combining these two together gives a clear understanding what earnings management is about. This will also be the definition that will be used here:

“Earnings management occurs when management uses judgment 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, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process)”

Important to notice though is that this definitions do not imply that earnings management is fraud. Common belief is often that earnings management is always fraud, but this is not the case. Earnings management does not always involve the purposeful misrepresentation of financial statements. It is often about the reasonable and legal (reporting) decisions the management makes to achieve stable financial results. If you look at the definition of financial fraud, as defined by the National Association of Certified Fraud Examiners, there is also another difference:

“The intentional, deliberate, misstatement or omission of material facts, or accounting data, which is misleading and, when considered with all the information made available, would cause the reader to change or alter his or her judgment or decision.”

This definition of fraud distinctively shows that fraud also has the effect that the reader changes or alters his or her judgment or decision. The relation with fraud came to existence because earnings management is a wide concept and has been connected with a lot of different subjects which do have affiliation with fraud like creative accounting, window dressing, income smoothing and taking a bath. Important for this thesis to realize is when these concepts come in to play, they are seen from the point of view of earnings management and hereby do not automatically implicate fraud.

The following table elucidates further on the paragraphs above with some examples, wherein conservative and aggressive accounting are earnings management and neutral accounting and fraud are not:

|  |  |
| --- | --- |
| **Reporting type** | **Accounting choices** |
| Within GAAP |
| Conservative Accounting  |  - Overly aggressive recognition of provisions or reserves. |
|  - Overstatement of restructuring charges and asset write-offs. |
| Neutral Accounting (Not earnings management) |  - Earnings that result from natural operations. |
| Aggressive Accounting |  - Understatement of the provisions of bad debt. |
|  - Drawing down provisions or reserves in an aggressive manner. |
| Violates GAAP |
| Fraud (Not earnings management) |  - Recording sales before they are realized. |
|  - Overstating of inventory with fictitious inventory. |
|  |   |

Even though this gives a clear distinction between fraud and earnings management, the borderline can be blurred in some cases, because when aggressive accounting becomes overly aggressive accounting it can violate GAAP as well. This can be explained by the following example.

Presume that a company sells alarm clocks and gives a free replacement if the alarm clock breaks in 12 months of buying the clock. The company calculates on basis of past years that this costs them on average € 4,90 per alarm clock sold and the complete range for warranty costs was between € 4,75 and € 5,-. If a manager would want to report the highest possible income per alarm clock he would be allowed to say that he expects that this year the expenses will be € 4,75 per alarm clock, even though this is the smallest amount in the historical range. If the manager can prove that due to product improvement the warranty expenses will be even lower he can also set the expected warranty cost per alarm clock on € 4,55.


In this example the € 4,25 has no reasonable support for warranty costs so that is violating the GAAP. This would also be the case for the € 4,55 if there would be no evidence that the product improvement would really lower the warranty expenses below the historical warranty cost range and it only is the optimism of the manager. If this is the case then it would be classified as overly aggressive accounting, as seen in the following illustration:

This shows the thin line between what is acceptable and what not. Managers are responsible to make the right choices for their company so that it justly reflects the company’s economic performance.

## 4.2 Incentives for earnings management

To get a clear view on why managers make use of earnings management, first we will look at some associated concepts. Earnings management is a result of the inequality of financial information. On one side there are the (potential) external stakeholders and other interested parties and on the other side there is the management of the company. The external parties want to obtain information on how the company’s performance was the previous year and what the expectations are for the coming years because they don’t have the same access to privileged information of the firm as the management does. The consequence of this is that the financial statements have an influence on all stakeholders involved. These economic consequences motivate the management to think about the choices they are making concerning the reporting process. If the management is thinking about this and makes decisions with regard to the reporting process and which accounting alternative they should implement this is called the accounting policy. When the management intervenes in the accounting policy because of the personal gains they might get out of this, as result of the inequality of information, this is called earnings management. (Praag, 2001)

At the foundation of why earnings management is utilized there lies the positive accounting theory and the agency theory. Ross Watts and Jerold Zimmerman (1986) are the founders of the positive accounting theory. They state that positive accounting seeks to explain and predict accounting practices. This can be viewed from an efficiency perspective and an opportunistic perspective.

The efficiency perspective has the point of view that the management chooses the accounting to attain corporate governance objectives of the company. The management compensation hypothesis is a part of the efficiency perspective. The hypothesis states that when the management’s remuneration is linked to the company’s accounting performance it motivates managers to manipulate the accounting method and figures.

The opportunistic perspective holds the view that managers choose accounting policies for their own benefits and the company’s benefits. Hypotheses that are linked with the opportunistic perspective are the debt/equity hypothesis, the bonus hypothesis and the political cost hypothesis.

The debt/equity hypothesis states that managers of companies with higher debt/equity ratio will manage earnings more than companies with a lower debt/equity ratio. They will do this so that they do not cross the constraints that have been put on the contract and they can pay the terms and interest of the debt that they have gathered. If the constraints will come too close, the management will use accounting methods and procedures to increase the accounting profit.

The bonus plan hypothesis states that companies with bonus plans will be more likely to suffer under earnings management than companies without a bonus plan. Because if the management can increase the income of a period this will most likely increase their personal income through the bonuses as well.

The political cost hypothesis states that companies which are bigger than other companies are more likely to use earnings management to weaken their results because, if they do not do this, they will get an increase in regulations and they will gather more attention from the government once they are large (high earning) companies. (Watts and Zimmermann, 1986)

All the hypothesis above are established by the principal agent theory. We will explain the bonus plan hypothesis with the principal agent timeline by Dye (1988):



On this timeline we see the manager as the agent and the opposing party as the principal. The principal has the inability to see all the information which is available for the manager, conform the principle agent theory, and because there are opposable interests in play, the manager alters the report so he can get a higher bonus.

## 4.3 Types of earnings management

As mentioned in the previous chapters, earnings management is a concept that can be utilized in a lot of different ways. The first thing people will think about when they hear about earnings management is that it is being used is to increase earnings. But managers use earnings management also to lower their earnings or maintain the same level of earnings as previous years.

The concepts that will be explained here are ‘taking a bath’ and ‘income smoothing’. In relation to the ‘income smoothing’, ‘the cookie jar’ will also be discussed.

### 4.3.1 Taking a bath

Contrary to common use of earnings management, it does not always have to be about the increase of the earnings. Taking a bath can be performed in many different ways, but they usually come forth from the same situation. Taking a bath often happens when a company has got a bad year compared to previous years and uses the present year to take extra losses so that the coming years the chance on a good result increases. This is done because managers believe that the effect between a bad result and a very bad result is relatively small, investors and stockholders don’t react completely different depending on how much loss there is from a certain level. Simply put: the costs of being worse are minimal, so they can rather take their extra losses one year and take the advantages of that in the following years.

This can be done for goodwill by impairing more than they would have done if they did not have a bad year. More obvious ways to take a bath are by increasing provisions and take large restructuring costs.

This is also very attractive for the management, because they will get the rewards in the following years for pulling the company out of their rough times. If a company has a bonus plan, then it increases the attractiveness for the management even more, because most likely they will not receive a bonus in a year of loss, so they don’t really care if the loss is bigger, as long as they don’t get fired, it just increases their chances in a bigger bonus next year.

Another situation in which taking a bath can take place is when there has been a switch in management. The new management likes to hold the old management responsible for things that are not going very well so that they can “improve expectations for the future and lower their own benchmark against which their performance will be measured” (Elliot and Shaw 1988, p. 98).

### 4.3.2 Income smoothing

Income smoothing is all about getting matching results with predetermined targets. Income smoothing can be defined as:

“The deliberate dampening of fluctuations about some level of income that is currently considered to be normal for the firm.” (Barnea et al, 1976)

What Barnea et al mean with this definition is that although a firm can have many opposing targets, for example increasing net income to meet market expectations, or lowering gross income for tax advantages, the line which has been chosen by the firm should be predictable, or with other words smooth, in the eyes of (possible) shareholders and investors.

There are multiple reasons for managers to perform income smoothing. The next paragraphs will elucidate on two important reasons.

According to Fudenberg and Tirole (1995) the reason managers perform income smoothing is because they are afraid to lose their jobs. Their theory is based on the presumption that if a company has had a bad year the management has higher chances of getting fired and when there is a good year, it does not secure the manager’s position for the coming years. This gives managers the incentive to perform income smoothing.

Another important reason for companies to have smooth earnings is meeting the expectation of shareholders. If a company can show steady results, year after year, they will get a lot of interest from shareholders. From the shareholders point of view this decreases the risk they are taking. The longer the company can hold on to these steady results, the bigger the positive effect will be.

There are many different things a company can do to be able to maintain steady results. One of these methods is the cookie jar. The cookie jar is a concept that is used in the opposite way as taking a bath. The cookie jar can be used when a company has had a good year and they want to preserve some of those results for the following years. For example they can make slightly bigger, or more, reserves than usual and for the following years they can ‘eat’ into the reserves, should it be necessary. By eating into reserves when necessary they can decrease unwanted fluctuations in the financial statements.

## 4.4 Summary and Conclusion

This chapter started with the explanation of what earnings management is all about. The definition that was stated is: ‘Earnings management occurs when management uses judgment 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, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process)’. Besides the definition also the link with fraud was explained and the differences between the two were defined. After this the incentives the management can have for earnings management were discussed through the positive accounting theory and the agency theory. To finalize this chapter about earnings management two different types of earnings management were discussed, income smoothing and taking a bath.

# Research design

In this chapter the research design will be developed. The research design will be based on the subjects discussed in the previous chapters. The research design will be formatted around the relation between goodwill impairments and earnings management and the effect the crisis has got on this relation. The first part of this chapter will attend to the development of the hypotheses on basis of the discussed literature. The second part of this chapter will concern the development of the model with which the hypotheses can be tested. To be able to use this chosen model it is necessary to have the appropriate data. Which data set will be used will be discussed in the following subchapter, research sample. Finally this chapter will end with a summary and a conclusion.

## 5.1 Development of Hypotheses

Based on the theoretical research performed in the previous chapters it is now possible to develop the hypotheses which, on basis of the research, will be rejected or accepted.

The first hypothesis is based on the effect of big bath accounting and the bonus plan hypothesis. The reasoning behind this hypothesis is as follows: If a company is performing below expectations for a year they are more likely to take as many losses as possible because the costs of being worse are minimal. This means that when a company did not had a good year it is more likely to make impairments of goodwill to make the loss even bigger. In other words they are taking a ‘big bath’, so that the management has got better chances of being rewarded the following years for turning the loss around in a profit.

This is also supported by research of Hayn and Hughes (2006), they state that the timing of goodwill write-offs can lag behind the economic impairment of goodwill. This supports the idea that the management takes goodwill write-offs when it suits them the best, for example in a year where big bath accounting can be exploited. Henning et al. (2004) found a comparable result from their research. They conform in their research that firms delay goodwill write-offs strategically for a certain period, when they know that their ratios are being scrutinized more securely by their shareholders.

Based on this reasoning the following hypotheses H1.0 and H1.1 can be formed:

*H1.0: Industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average.*

*H1.1: Industrial firms are not more likely to recognize a goodwill impairment loss when they perform below branch average.*

The second hypothesis is formed around the effect of income smoothing. As signaled in chapter 4, income smoothing is performed by the management to make sure that the financial statements are conform expectations of third parties. With other words, when the earnings are higher than the expectation. On first sight this seems like a situation where the management would cherish these results instead of performing earnings management to diminish the profitable effect. But according to Fudenberg and Tirole (1995) the reason managers perform income smoothing is because they are afraid to lose their jobs. Their theory is based on the presumption that if a company has had a bad year the management has bigger chances of getting fired and when there is a good year, it does not secure the manager’s position for the coming years. This gives managers the incentive to perform income smoothing.

Another reason is stated by Han and Wang (1998), they found in their research that oil firms which expected to profit from the Persian Gulf crisis used earnings management to reduce their quarterly reported earnings. They state that the oil firms did this because the positive effect generated by reporting good news, i.e. a higher amount of earnings, is outweighed by the negative effect of political sensitivity and associated costs. Their findings are in line with the political cost theory. The political cost hypothesis states that companies which are bigger than other companies are more likely to use earnings management to weaken their results because they will gather more attention from the government once they are large (high earning) companies.

Based on this reasoning the following hypotheses H2.0 and H2.1 can be formed:

*H2.0: Industrial firms are more likely to recognize a goodwill impairment loss when they perform above branch average.*

*H2.1: Industrial firms are not more likely to recognize a goodwill impairment loss when they perform above branch average.*

Besides these hypotheses we will look at the impact the crisis had got on the level of earnings management that was performed. Because of the bad economy it is expected that the incentives for the management to perform big bath accounting and income smoothing have increased. More than ever have companies got a good excuse to show lower results than usual and take a big bath.

That managers use excuses to perform earning management is also shown by the research of Sevin and Schroeder (2005). They investigated if the adoption of SFAS 142 had the effect on companies that they engaged in earnings management. They found that a significantly greater part of firms indeed reported negative earnings in the year of SFAS 142 adoption. This is an interesting result and it would indicate that managers are more likely to perform earnings management when there are external factors which give them an opportunity to get away with less positive results than normal.

Next to this the management has more incentives to diminish their positive results because of the crisis. This is also shown through the political cost hypothesis and income smoothing. Because of the crisis, companies who are doing good will stand out even more and will have more incentive to weaken their results. Next to this, when a company has got a good year, the management is more inclined to make larger impairments so that they do not have to make these impairments in the coming years when the performance of the company could be getting dissatisfactory.

On basis hereof the following hypotheses H3.0 and H3.1 can be formed:

*H3.0: Due to the crisis the incentive for management to perform earnings management has increased.*

*H3.1: Due to the crisis the incentive for management to perform earnings management has not increased.*

Based on these 3 hypotheses, the possible outcomes of this thesis can be predicted. Important to keep in mind is that in order to investigate hypothesis 3, the hypotheses 1 and 2 will be performed individually for the years 2007 and 2009. Also, hypothesis 3 can be rejected for hypothesis 1 but at the same time be accepted for hypothesis 2. This gives 6 different options of acceptance and rejection and therefore 64 different theoretical outcomes. For an overview see Appendix 2. Theoretical outcomes.

Based on the hypotheses several options are not possible. These options are caused by one of two situations:

1. The options for which hypothesis H1.0 or H2.0 is rejected for both 2007 and 2009 and hypothesis H3.0 is accepted. Seen as there is no significant effect noted in both years, it can also not be increased. For the options which this concerns refer to the pink selection in Appendix 2. Theoretical outcomes.

2. The options for which hypothesis H1.0 or H2.0 is accepted for 2007 but rejected for 2009. Seen as there is no significant effect, it cannot be increased for 2009. For the options which this concerns refer to the light red selection in Appendix 2. Theoretical outcomes.

This leaves 36 possible outcomes for this thesis based on the above noted hypotheses.

## 5.2 Development of Model

To be able to accept or reject the hypotheses it is necessary to have a model with which the hypotheses can be tested. Choosing the right statistical model is mainly dependent on the variables that you are working with. Therefore the variables that will be needed to investigate the hypotheses will be discussed first. On basis of these variables the most appropriate statistical test method will then be chosen. Following the statistical method, the model will be developed. The model as described below does not have to be final. When the data is implemented and it appears that the model does not have the right explanatory power or if the variables are not significant the model will be adjusted where possible to obtain more conclusive results.

5.2.1 Types of Variables

A statistical study examines the relation between variables. These variables are measured on the same individuals. Sometimes one of the variables can explain or influence the other variable. Such an explanatory variable is called an independent variable. The variable that is explained or influenced is called a dependent variable. On basis of the hypotheses the impairment decision is the dependent variable. As signaled in the previous chapter, development of hypotheses, the dependent variable is influenced by several variables. Based on this information there are several statistical test methods suitable to perform the research. The table below shows several guidelines for tests to choose from, given a specific set of independent and dependent variables:

|  |  |  |
| --- | --- | --- |
| Nature of independent variables | Nature of dependent variable | Test |
| 2 or more independent variables (independent groups) | Interval & ratio | factorial ANOVA |
| Ordinal or interval | ordered logistic regression |
| Categorical | factorial logistic regression |
| 1 or more interval | Interval & Ratio | multiple regression |
| independent variables and/or  | analysis of covariance |
| 1 or more categorical independent variables | Categorical | multiple logistic regression |
| discriminant analysis |

The table above points to several statistical test methods on basis of a separation between the nature of the variables. These natures are categorical, ordinal, interval and ratio. Categorical and ordinal can be grouped in the qualitative variables. These variables exist out of several independent groups. The interval and ratio variables can be grouped in the quantitative variables. These variables can be counted or measured. See below for an explanation of the different types of variables:

*Categorical*

A categorical variable, also known as a nominal variable, represents a name or a class. Important requirements for this variable are:

1. Variables on this scale represent mutual exclusion (a variable cannot be on multiple classes of a scale).
2. There is no order of ranking.

Examples for these kinds of categorical classes are provinces, sexes and eye color. These variables can be numbered, but any kind of calculations or order of ranking on these numbers would be useless.

*Ordinal*

Just like categorical variables, ordinal variables refer to mutual exclusive categories. The difference is that there can be given an order of ranking to the ordinal variables. For example a company can be small, medium or large. Important to note is that ordinal variables have a natural order but not a natural spacing or range between the variables. It would be wrong to conclude that the difference between ‘strongly disagree’ and ‘disagree’ would be as large as the difference between ‘impartial’ and ‘agree’.

*Interval*

The interval variable takes the ordinal variable one step further. Just like the ordinal variables there is an order of ranking but there is also a natural spacing between the possibilities on the scale. Some examples are shoe sizes or degrees of Celsius. Important to note with interval variables is that there is no clear definition of zero. The means that the difference between shoe size 40 and 42 is as big as the difference between 43 and 45 but it would be wrong to implicate that shoe size 24 is twice as small as 48.

*Ratio*

The ratio variable is equal to the interval variable except is does have a clear definition of zero. This means that when the value of the ratio variable reaches zero, there is none of that variable. This can be said for length or money.

### 5.2.2 Research variables

To end up at the right statistical test the variables that will be needed to research the hypotheses will be discussed:

*Dependent Variable:*

The dependent variable will be the impairment of goodwill (*IMPit*). Whence looking at the literature concerning research done to impairment losses in relation to earnings management, this variable has been measured in several different ways. It can be measured as a dummy variable, 0 or 1. With a dummy variable the impairment decision will be investigated. Which means that if *IMPit* has a value of 1, it indicates that this company (*i*), for the year (*t*), has taken an impairment loss. If the indicator value is 0, then the company (*i*) has not taken an impairment in year (*t)*. Another measuring method would be to take the impairment amount. This thesis focusses on the relation between the decision of management to take an impairment of goodwill and earnings management, therefore the dependent *IMPit* indicator variable will be measured as a dummy variable, 0 or 1.

*Independent Variables:*
The hypotheses 1 and 2 state that goodwill impairment losses are more likely to take place when a company performs better or worse than branch average. To prove that there is a relation between goodwill impairment losses and performance of a company the right variables need to be included in the statistical model. These variables exist out of two different types of variables. First of all there are the variables that are specifically directed towards the testing of the hypotheses. The second set of variables are the control variables.

The variables that are directed towards the testing of the hypotheses are the ones that indicate the performance of a company. For the industrial production companies on which the population will be based the key performance indicators are sales and cash flow from operations. Another important performance indicator that shows the effectiveness of an industrial company is the return on assets. These variables will be admitted in the statistical model to indicate the performance of a company.

Besides these economic performance indicators there are the control variables which increase the chance of taking an impairment loss. For these factors variables need to be included so that the effect of these factors can be controlled. These factors are the total amount of goodwill a company has got and the size of a company measured through their total assets.

The independent variables will now be discussed in more detail:

*Economic Factors:*

The first variable is related to the reporting incentive for the management to perform big bath accounting. This variable relates to hypothesis 1 and will be called *BigBathit*. When a company performs significantly below the branch average the value of *BigBathit* will be 1, when the company performs above branch average the value will be 0. To gain the most accurate variable to represent if a company performs below branch average the variable will be measured by dividing the pre-impaired earnings from year *t* with the total assets of the company at year *t* and comparing this to the median of the branch. When a company is below the industry median of non-zero negative values, *BigBathit* will be 1. When the company is above the industry median of non-zero negative values *BigBathit* will be 0.

The second variable is related to the reporting incentive for the management to perform income smoothing. This variable relates to hypothesis 2 and will be called *IncSmoothit*. When a company performs significantly above the branch average the value of *IncSmoothit* will be 1, when the company performs below branch average the value will be 0. As done with *BigBath it* the variable will be measured by dividing the pre-impaired earnings from year *t* with the total assets of the company at year *t* and comparing this to the median of the branch. When a company is above the industry median of non-zero positive values, *IncSmoothit* will be 1. When the company is below the industry median of non-zero positive values *IncSmoothit* will be 0.

The third, fourth and fifth variables are company specific factors that relate to the economic performance of a company. The third variable is the percentage change in sales from year *t-1* to *t,* ∆*SALESit*. The fourth variable relates to the cash flow from operations and is the percentage change in company *i*’s operating cash flow from year *t-1* to year *t*. This variable is called ∆*CFOit*. The fifth variable is the companies change from year *t-1* to year *t* in operating income to identifiable assets, called ∆*ROAit*.

*Control variables:*

The amount of goodwill a company has got relative to their assets influences the probability a company takes an impairment loss. It is expected that there is a positive relation between this variable and the impairment decision, because when the relative size of goodwill is increasing the exposure to impairments will also increase. This variable will be called *GWit-1* because the amount of goodwill and the total assets of *t-1* will be used. Subsequently it is evident that the total amount of assets also has got an influence on the impairment decision. Therefore the factor *SIZEit* has been taken into the equation. *SIZEit* will be the natural logarithm of the size of the company’s total assets. This factor controls for the effect the total size of the assets has got on making an impairment.

## 5.3 Conclusion of research model

Based on the variables as noted above, the proper research model can be chosen. When looking at the table as stated in the beginning of the chapter the natures of the dependent and independent variables are now known:

|  |  |  |
| --- | --- | --- |
| Nature of independent variables | Nature of dependent variable | Test |
| 2 or more independent variables (independent groups) | Interval & ratio | factorial ANOVA |
| ordinal or interval | ordered logistic regression |
| Categorical | factorial logistic regression |
| 1 or more interval | Interval & Ratio | multiple regression |
| independent variables and/or  | analysis of covariance |
| 1 or more categorical independent variables | Categorical | multiple logistic regression |
| discriminant analysis |

Seen as the dependent variable can only be indicated by a positive or negative impairment decision, 0 or 1, a multiple regression model would not be suitable because the dependent variable is assumed to have a normal distribution. The technique most commonly used for dependent variables with a 0/1 value are logistic regression models.

Seen as the independent variables are categorical, this would leave us with multiple logistic regression. Based on comparable studies, for example, van de Poel et al. (2008), Elliot and Shaw (1988), Henning, Shaw and Stock (2004) and Lemans (2009), the statistical model most used with these kind of studies is also multiple logistic regression.

Seen as the model which matches the above described variables the best, is the model as described by van de Poel et al. (2008), this will be the model that will be used as a basis for further research. The other models focus more on other variables. Therefore van de Poel et al (2008) is a better match. The model of van de Poel et al (2008) looks as follows:

$$IMP\_{it}=α\_{0}+α\_{1}GW\_{it-1}+α\_{2}SIZE\_{it}+α\_{3}∆indROA\_{it}+α\_{4}∆SALES\_{it}+α\_{5}∆CFO\_{it}+α\_{6}BATH\_{it}+α\_{7}SMOOTH\_{it}+α\_{8}BIG4\_{it}+α\_{9}BATH\_{it}\*BIG4\_{it}+α\_{10}SMOOTH\_{it}\*BIG4\_{it}+\sum\_{}^{}α\_{j}CONTROLS\_{itj}+ε\_{it}$$

Also refer to Appendix 3. Model as used by van the Poel et al. (2008). Based on this model and the variables as described previously the multiple logistic regression research model will be:

$$IMP\_{it}=α\_{0}+α\_{1}GW\_{it-1}+α\_{2}SIZE\_{it}+α\_{3}∆SALES\_{it}+α\_{4}∆CFO\_{it}+α\_{5}∆ROA\_{it}+α\_{6}BigBath\_{it}+α\_{7}IncSmooth\_{it}+ε\_{it}$$

The starting point is that *IMP*it is 0 or 1. Were 0 represents that the company has taken no goodwill impairment and 1 represents a goodwill impairment. The mean response is the probability *p* of success. This logistic regression model tries to explain *p* in terms of several explanatory variables. The model will show which explanatory values influence the decision to take a goodwill impairment significantly.

There are two variables present that were not discussed yet, *α0* and ε*it*. These are the intercept and the stochastic variable. The intercept, *α0* is the constant mean value of *IMP*it when the explanatory variables are equal to zero. The last variable is the stochastic variable. This variable is added because the explanatory values cannot describe *IMP*it exactly. There are always minor deviations. These deviations from the population means are consequence of three possible causes. Firstly there can be variables that were not observed or could not be observed. This could happen when a company has got a unique situation which influences their decision to take an impairment loss. Secondly the model assumes that there is a linear relation between the variables and the impairment decision. This assumption does not have to be true. And at last there can be measuring errors. These can be errors made when the data is collected, or when the data is entered into a data file for example. The stochastic variable can be seen as the repository for several different errors which create a deviation between the true and the expected value of the impairment decision.

## 5.4 Research sample

To obtain a proper research sample the quantitative and qualitative qualities of the sample are important. The qualitative side will be covered by focusing on listed companies. The annual accounts of these companies are audited by independent auditors and therefore increase the reliability and qualitative side of the data. Besides this, the data will be obtained through the Thomson One Banker financial database. The Thomson One Banker is a renowned financial database in which financial information can be found, derived from annual financial reports from companies quoted on stock exchanges.

The quantitative side will be covered by choosing an industry and geographic area which will guarantee a large enough sample size with the right variables and comparable at the same time. For example, if the research sample would be all the companies listed on a single stock exchange, like the Amsterdam Exchange Index, the sample would have to be derived from several different lines of industries, which have different ratio’s in their financial statements and different structures. These would distort the results. This could be solved by splitting the research sample into different branches, but then the various samples would not be big enough to draw conclusive results.

Therefore the research sample will exist out of industrial production companies which are listed on a stock exchange in member states of the European Union. Because all the member states of the European Union are chosen, the sample size will be big enough. The focus lies on industrial production companies because they, more often than not, have goodwill on balance and no previous research on industrial production companies in relation to earnings management could be found in the literature to date. Therefore this increases the social relevance of this thesis.

These samples will be derived twice from the Thomson One Banker database to be able to compare the differences between the relations before and after the beginning of the crisis. Seen as the crisis started at 2008, the years 2007 and 2009 are selected to be included in the research sample. Because several variables also require data from the previous year, like *SIZEit* (goodwill and assets previous year), ∆*CFOit* (operating cash flow previous year) and ∆*ROAit* (return on assets previous year), these data are also derived from Thomson One Banker database for the years 2006 and 2008.

By setting these three conditions, industry, geography and time, the initial population exists of 1384 companies.

*Industry and geography*As mentioned before, to obtain the relevant data the Thomson One Banker financial database was chosen. To be able to extract data only from the industrial production companies a certain classification has to be entered into the Thomson One Banker analysis program. For the classification the Standard Industrial Classification (SIC) was used. This is a system for classifying industries by a four-digit code. Several organisations use this code, among others the U.S. Securities and Exchange Commission. On basis of the SIC, the following groups were selected:

33 Primary metal industries.
34 Fabricated metal products, except machinery and transportation equipment.
35 Industrial and commercial machinery and computer equipment.
36 Electronic and other electrical equipment and components, except computers.
37 Transportation equipment.
38 Instruments and related products.
39 Miscellaneous manufacturing industries.

By selecting these SIC codes the industry condition of the sample is covered. After the industry, the countries which participate in the population, are selected. These countries are the members of the European Union:

Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

The public companies in these SIC groups and countries cumulate to a total population of 1384 companies.

*Final Sample*From the initial population of 1384 companies several have been removed from the population to reach the final research samples of 778 for 2007 and 835 for 2009. This is mainly due to the fact that not all of the companies had goodwill at the start of the years 2007 and 2009. For 2007, 563 companies did not have goodwill and for 2009 this applied to 514 companies. The companies which did not have any goodwill are not participating in the research sample because they could not make impairments to their goodwill. These companies are however included in the calculation for the industry average which will be compared with the pre-impaired earnings from year *t* divided by the total assets of the company at year *t* for the variables *IncSmoothit* and *BigBath it*.

Besides companies who did not have goodwill there are also companies who entered or left the stock exchange during one of the years 2006 through 2009 and therefore the data is not completely available for every year. This applies to 43 companies in the 2007 selection and 35 in the 2009 selection. Refer to table 5.1 for a summary:

*Table 5.1 Final sample*

|  |  |  |
| --- | --- | --- |
|  | 2007 | 2009 |
| Initial population | 1.384 | 1.384 |
| Amount of Goodwill is €0,- | -563 | -514 |
| Incomplete data | -43 | -35 |
| Final sample | 778 | 835 |

## 5.5 Summary and Conclusion

The research design described in this chapter is based on the hypotheses that were set out. These hypotheses are: H1.0: Industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average, H2.0: Industrial firms are more likely to recognize a goodwill impairment loss when they perform above branch average and H3.0: Due to the crisis the incentive for management to perform earnings management has increased.

The statistical model chosen for analysis on these hypotheses is based on the variables needed to research the hypotheses and leaded to a multiple logistic regression model. After the hypotheses were set out and the statistical model was determined, considerations were made to obtain a proper research sample with comparable data. The final sample exists only out of industrial production companies with goodwill on balance at the start of the year, listed on the stock exchange in both 2007 and 2009 and based in a member country of the European Union.

# Descriptive statistics

This chapter covers the implementation of the data sample as described in the previous chapter into SPSS. First the descriptive statistics of the data will be described in subchapter 6.1. Then the power and significance of the model will be described in subchapter 6.2. To end this chapter the multicollinearity of the model will be discussed.

## 6.1 Descriptive statistics

First we will look at the descriptive statistics of the sample that was described in the previous chapter. These descriptive statistics will be used to gain insight in the data set that is used.

Table 6.1 shows that there were more impairments made in 2009 than in 2007:

 *Table 6.1 Descriptive statistics, frequencies*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Impairments 2007 |  | Impairments 2009 |
|   | Frequency | Percent |  | Frequency | Percent |
| 0 | 645 | 82,9 |  | 656 | 78,6 |
| 1 | 133 | 17,1 |  | 179 | 21,4 |
| Total | 778 | 100,0 |  | 835 | 100,0 |

When looking at the variables of ∆SALES and ∆CFO for 2007 in table 6.2 below and ∆SALES, ∆CFO and ∆ROA for 2009 in table 6.3, it becomes apparent that the maximum is extremely high compared to the mean. This indicates outliers. Outliers are observations that lie an abnormal distance from other observations. To confirm which observations can be marked as outliers to be excluded from the sample, box plots have been made. See appendix 4. Box plots.

 *Table 6.2 Descriptive statistics, 2007*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| Imp | 778 | 0 | 1 | 0,171 | 0,377 |
| GW | 778 | -0,137 | 0,963 | 0,129 | 0,137 |
| SIZE | 778 | 5,710 | 11,210 | 8,411 | 0,931 |
| ∆SALES | 778 | -93,408 | 4660,150 | 30,348 | 194,824 |
| ∆CFO | 778 | -54,706 | 1047,690 | 1,246 | 38,176 |
| ∆ROA | 778 | -54,399 | 87,902 | 0,796 | 11,283 |
| BigBath | 778 | 0 | 1 | 0,063 | 0,243 |
| IncSmooth | 778 | 0 | 1 | 0,436 | 0,496 |

*Table 6.3 Descriptive statistics, 2009*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| Imp | 835 | 0 | 1 | 0,214 | 0,411 |
| GW | 835 | -0,40 | 0,95 | 0,145 | 0,143 |
| SIZE | 835 | 5,40 | 11,33 | 8,357 | 0,952 |
| ∆SALES | 835 | -99,55 | 664,50 | -5,348 | 35,783 |
| ∆CFO | 835 | -45,79 | 252,46 | 0,641 | 10,776 |
| ∆ROA | 835 | -117,71 | 330,56 | -2,498 | 20,187 |
| BigBath | 835 | 0 | 1 | 0,162 | 0,368 |
| IncSmooth | 835 | 0 | 1 | 0,338 | 0,473 |

In order to judge which observations can be marked as outliers the assumption of approximately three box lengths has been used. As a result 11 outliers in the 2007 sample and 9 outliers in the 2009 sample have been excluded from this point on. The removal of outliers has not significantly influenced the frequency of impairment decisions.

For the impact on the box plots, refer to Appendix 4. Box plots. The descriptive statistics per variable after the removal of outliers is shown in table 6.4 and 6.5. The removal of outliers had the biggest influence on the descriptive statistics of ∆SALES 2009. The mean dropped with 12,98 and the standard deviation with 161,69. Further analysis show that the mean for ∆CFO has decreased 1,46 in 2007 and the standard deviations of ∆SALES, ∆CFO and ∆ROA have decreased significantly for 2009.

 *Table 6.4 Descriptive statistics after outliers, 2007*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| Imp | 767 | 0 | 1 | 0,171 | 0,377 |
| GW | 767 | -0,137 | 0,963 | 0,128 | 0,135 |
| SIZE | 767 | 5,710 | 11,210 | 8,421 | 0,929 |
| ∆SALES | 767 | -93,408 | 272,629 | 17,370 | 33,138 |
| ∆CFO | 767 | -38,087 | 19,309 | -0,209 | 4,093 |
| ∆ROA | 767 | -54,399 | 74,127 | 0,669 | 10,875 |
| BigBath | 767 | 0 | 1 | 0,059 | 0,235 |
| IncSmooth | 767 | 0 | 1 | 0,438 | 0,496 |

*Table 6.5 Descriptive statistics after outliers, 2009*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| Imp | 826 | 0 | 1 | 0,215 | 0,411 |
| GW | 826 | -0,402 | 0,946 | 0,145 | 0,144 |
| SIZE | 826 | 5,397 | 11,241 | 8,360 | 0,941 |
| ∆SALES | 826 | -99,124 | 188,647 | -6,168 | 27,040 |
| ∆CFO | 826 | -39,058 | 33,878 | 0,121 | 4,617 |
| ∆ROA | 826 | -117,714 | 68,383 | -3,238 | 13,198 |
| BigBath | 826 | 0 | 1 | 0,162 | 0,369 |
| IncSmooth | 826 | 0 | 1 | 0,339 | 0,474 |

When comparing 2007 to 2009, these tables show a decline in the performance of the companies when looking at ∆SALES and ∆ROA. The ∆SALES in 2007 show a positive mean of 17,37 and in 2009 the mean has become 6,17 negative. The ∆ROA has also turned from positive to negative. Opposite to this, the ∆CFO shows an improvement in 2009. Although the fluctuation between 2007 and 2009 is smaller than ∆SALES and ∆ROA, the ∆CFO mean was negative in 2007 and positive in 2009.
Important to notice is that there are 45 companies observed which provide conditions for the big bath accounting in 2007 and 134 in 2009. This is because for these companies the variable *BigBathit* has a value of 1. For income smoothing there are 336 companies observed which provide conditions for income smoothing in 2007 and 280 in 2009.

## 6.2 Power and significance

Before conclusions are drawn from the model, it is important to look at the power of a model. The power indicates the proportion of the impairment decision that is influenced by the independent variables of the model. The value used to gain insight in the power is R-square. See table 6.6 for the R-square of 2007 and 2009. This table shows that the proportion of the impairment decision influenced by the independent variables of the model is 6,5% in 2007 and 3,5% in 2009. Even though comparable research models often have R-squares lower than 10%, Wang 2009, Ostende 2009 and Praag 2001, the model will be adjusted to examine if the R-square can be increased.

 *Table 6.6 Model summary*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 2007 | 25,5% | 6,5% | 5,7% | 0,366 |
| 2009 | 18,8% | 3,5% | 2,7% | 0,406 |
| a Predictors: (Constant), IncSmooth, GW, CFO, SALES, SIZE, ROA, BigBath |

To increase the explanatory power of the model, variables can be added, or existing variables can be changed. This can also be the dependent variable. For example the dependent *IMPit* can be changed from a dummy variable, to goodwill impairments made during the year divided by total assets at the beginning of the year. If the dependent variable changes to this value, the R-square is increased to 11,4% in 2007 and 10,1% in 2009. As can be seen in table 6.7 below.

 *Table 6.7 Model summary 2*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 2007 | 33,8% | 11,4% | 10,6% | 0,021 |
| 2009 | 31,8% | 10,1% | 9,4% | 0,024 |
| a Predictors: (Constant), IncSmooth, GW, CFO, SALES, SIZE, ROA, BigBath |

This however decreases the significance of the variables *BigBathit* and *IncSmoothit* significantly. Seen as these are the variables that are investigated the dependent *IMPit* will not be changed and will stay a dummy variable.

For the part that is explained by the variables, it is important to test if this predictable power is significant. This means that a significant proportion of the variability in *IMPit* can be predicted by the independent variables. This can be tested by running the ANOVA table. See table 6.8:

 *Table 6.8 Anova 2007 and 2009*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Sum of Squares | df | Mean Square | F | Sig. |
| **2007** |  |  |  |  |  |
| Regression | 7,08 | 7 | 1,01 | 7,56 | 0,000 |
| Residual | 101,55 | 759 | 0,13 |  |  |
| Total | 108,63 | 766 |  |  |  |
|  |  |  |  |  |  |
| **2009** |  |  |  |  |  |
| Regression | 4,95 | 7 | 0,71 | 4,29 | 0,000 |
| Residual | 134,69 | 818 | 0,16 |  |  |
| Total | 139,64 | 825 |  |  |  |

a Predictors: (Constant), IncSmooth, CFO, GW, SIZE, ROA, SALES, BigBath

b Dependent Variable: Imp

The value to look for is the Sig. For both 2007 and 2009 this is 0,000. This means that the prediction is significant at a one percent level.

## 6.3 Multicollinearity

Besides outliers, power and significance there is another important factor to consider and that is multicollinearity. Multicollinearity occurs when there is a strong correlation between two independent variables. The result of this multicollinearity is that the regression model estimates if the coefficients can become unstable and the standard errors for the coefficients can inflate out of proportion. The model as a whole can still be reliable, but the explanatory value of an independent variable is not reliable.

In literature related to the subject of impairments and earnings magement, for example Wang 2009 and Ostende 2009, multicollinearity is said to be detected by performing a Pearson correlation test. This is however not correct because the Pearson correlation test checks for bi-collinearity and not multicollinearity. A better test to check for the presence of multicollinearity is to look at ‘tolerance’ and the variance inflation factor.

*Table 6.9 Collinearity Statistics*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  2007 |  |  | 2009 |
|  | Tolerance | VIF |  |  Tolerance | VIF |
| GW | 0,975 | 1,026 |  |  | 0,949 | 1,053 |
| SIZE | 0,911 | 1,097 |  |  | 0,895 | 1,118 |
| ∆SALES | 0,978 | 1,022 |  |  | 0,831 | 1,204 |
| ∆CFO | 0,994 | 1,006 |  |  | 0,988 | 1,012 |
| ∆ROA | 0,959 | 1,043 |  |  | 0,877 | 1,140 |
| BigBath | 0,858 | 1,165 |  |  | 0,751 | 1,332 |
| IncSmooth | 0,943 | 1,060 |  |  | 0,842 | 1,187 |
| Dependent Variable: Imp |  |

The tolerance indicates the percent of variance in the independent variable which cannot be accounted for by other independent variables. The variance inflation factor is 1 divided by the ‘tolerance’. The commonly used assumption is when the ‘tolerance’ is smaller than 10% or when the VIF is greater than 10 there may be an indication for multicollinearity. As shown in table 6.9, there is no indication of multicollinearity.

## 6.4 Summary and conclusion

In this chapter the descriptive statistics were discussed. There were 4% more impairments made in 2009 than in 2007. Based on the descriptive statistics of the variables there were several outliers discovered which were removed. As a result 11 outliers in the 2007 sample and 9 outliers in the 2009 sample have been excluded. These were observations from the variables ∆SALES, ∆CFO and ∆ROA.
After the descriptive statistics the power and significance of the model was described. As testing showed, the explanatory power of the model was increased by changing the dependent variable from a dummy into real values. This however decreased the significance of the variables *BigBath it* and *IncSmoothit*. Because the proportion of the independent variable which was explained through the model is comparable to related research and the explanatory power proved to be significant at the 1% level, the dependent variable remained a dummy variable.
Finally, collinearity statistics were run, that showed there is no indication for multicollinearity. Therefore no additional tests for multicollinearity need to be performed.

# Results and Analysis

This chapter will discuss the results of the regression analysis performed. This will be divided into three subchapters, first the 2007 regression analysis will be reviewed. In subchapter 7.2 the regression analysis of 2009 will be reviewed. After these subchapters the results of 2007 and 2009 will be compared and the effect of the crisis will be analyzed. The chapter will end with a summary and conclusion.

## 7.1 Regression analysis 2007

This section will discuss the results of the regression analysis 2007. These are based on the data which was implemented in SPSS as discussed in the previous chapters. The estimates of the regression coefficients are shown in table 7.1:

 *Table 7.1 Coefficients 2007*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | B | Std. Error | Beta | t | Sig. |
| 1 (Constant) | 0,189 | 0,128 |  | 1,469 | 0,142 |
| GW | 0,304 | 0,099 | 0,109 | 3,069 | 0,002 |
| SIZE | -0,006 | 0,015 | -0,015 | -0,412 | 0,680 |
| ∆SALES | 0,000 | 0,000 | 0,002 | 0,063 | 0,950 |
| ∆CFO | -0,005 | 0,003 | -0,053 | -1,501 | 0,134 |
| ∆ROA | -0,002 | 0,001 | -0,052 | -1,457 | 0,145 |
| BigBath | 0,279 | 0,061 | 0,174 | 4,606 | 0,000 |
| IncSmooth | -0,049 | 0,027 | -0,065 | -1,804 | 0,072 |
| a Dependent Variable: Imp |  |  |  |  |

Table 7.1 shows that the control variable *GW it* and the reporting incentives *BigBath it* and *IncSmoothit* have a significant influence on the impairment decision. Hereby it should be noted that *GW it* and *BigBath it* are significant at the 1% level and *IncSmoothit* at the 10% level.

When the effects of these variables on the impairment decision are examined more thoroughly, the conclusion can be drawn that the effect of *GW it* is conform expectation. When a company has got more goodwill on their opening balance, the impairment decision is positively influenced by this.

The reporting incentive *BigBath it* also has a positive significant influence on the impairment decision. This is also conform the expectation, since *BigBath it* takes a value of one when the company performs below industry mean, concluding that when a company performs below industry mean, the change of taking an impairment loss is significantly increased. This implies that companies use big bath accounting through impairments losses as a tool for earnings management. Therefore this provides evidence for Hypothesis 1that industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average.

The reporting incentives *IncSmoothit* shows a negative significant influence on the impairment decision. This would imply that when a firm performs above branch average the change of taking an impairment loss significantly decreases. This is contrary to expectations and previous research (Zucca and Campbell, 1992; Van de Poel et al., 2008; Wang, 2009) and provides evidence that rejects Hypothesis 2.0 that industrial firms are more likely to recognize a goodwill impairment loss when they perform above branch average. One explanation for the effect that is seen here which contradicts expectations and previous research is that the size of the firms performing above branch average when looking at the pre-impaired earnings from year *t* divided by the total assets of the company at year *t* and comparing this to the median of the branch is larger than the approximately 25% expected. This is due to the fact that there were more positive pre-impaired earnings as shown in figure 7.1

 *Figure 7.1 2007 Pre-impaired earnings*

The reporting incentive *IncSmoothit* is calculated by dividing the pre-impaired earnings from year *t* with the total assets of the company at year *t* and comparing this to the median of the branch. When a company is above the industry median of non-zero positive values, *IncSmoothit* will be 1. When the company is below the industry median of non-zero positive values *IncSmoothit* will be 0.

As shown in figure 7.1, the pre-impaired earnings observations which had received a 1 for performing above branch average are almost 50% of the total sample (336 out of 767). To filter the test sample on top performing companies, the regression analyses 2007 has been performed again, but this time only the top 100 of the companies performing above branch average are given a 1 for *IncSmoothit*. This gives the following regression coefficients:

*Table 7.2 Alternative testing coefficients 2007*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | B | Std. Error | Beta | t | Sig. |
| 1 (Constant) | 0,186 | 0,128 |  | 1,448 | 0,148 |
| GW | 0,299 | 0,099 | 0,107 | 3,013 | 0,003 |
| SIZE | -0,008 | 0,015 | -0,019 | -0,505 | 0,614 |
| ∆SALES | 0,000 | 0,000 | 0,000 | 0,006 | 0,995 |
| ∆CFO | -0,005 | 0,003 | -0,054 | -1,529 | 0,127 |
| ∆ROA | -0,002 | 0,001 | -0,053 | -1,484 | 0,138 |
| BigBath | 0,293 | 0,060 | 0,183 | 4,910 | 0,000 |
| IncSmooth | -0,061 | 0,041 | -0,052 | -1,469 | 0,142 |
| a Dependent Variable: Imp |  |  |  |  |

Based on these results, IncSmooth is not significant. Therefore previous research is not disproved and the indication for rejection of Hypotheses 2, that industrial firms are more likely to recognize a goodwill impairment loss when they perform above branch average, remains.

## 7.2 Regression analysis 2009

This section will discuss the results of the regression analysis 2009. These are based on the data which was implemented in SPSS as discussed in the previous chapters. See table 7.3 Coefficients 2009 for the estimates of the regression.

 *Table 7.3 Coefficients 2009*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | B | Std. Error | Beta | t | Sig. |
| 1 (Constant) | -0,338 | 0,138 |  | -2,458 | 0,014 |
| GW | 0,116 | 0,101 | 0,040 | 1,145 | 0,253 |
| SIZE | 0,061 | 0,016 | 0,140 | 3,870 | 0,000 |
| ∆SALES | -0,001 | 0,001 | -0,035 | -0,930 | 0,353 |
| ∆CFO | -0,003 | 0,003 | -0,031 | -0,909 | 0,363 |
| ∆ROA | -0,002 | 0,001 | -0,078 | -2,120 | 0,034 |
| BigBath | 0,100 | 0,044 | 0,089 | 2,257 | 0,024 |
| IncSmooth | -0,010 | 0,033 | -0,012 | -0,318 | 0,751 |
| a Dependent Variable: Imp |  |  |  |  |

As we can see in Table 7.3 there are several unexpected results. *GW it* does not have a significant influence on the dependent variable *Imp it*. The control variable *Size it* however does have a positive significant influence on the dependent variable *Imp it* conform expectations. This shows that when a company has got more assets, the chance of taking an impairment loss is significantly higher.

Change in return on assets shows a negative significant influence on the dependent variable *Imp it*. This implicates that when a company has a higher return on assets the chance is significantly smaller that they would take an impairment loss. This observation points to big bath accounting, because a larger decrease in the return on assets is linked to a higher chance of taking an impairment loss.

The reporting incentives *BigBath it* also has a positive significant influence on the impairment decision. This is conform expectation and the 2007 coefficients. This provides further evidence for the fact that companies use big bath accounting through impairments losses as a tool for earnings management and that Hypothesis 1.0, ‘industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average’is not rejected.

Besides these three significant coefficients the other independent variables do not have a significant influence on the impairment decision.

## 7.3 Effects of the crisis

To analyze the effects of the crisis, the significance and the explanatory power of the coefficients will be compared between the 2007 and 2009 regression analyses.

Based on the results of the regression analyses 2007 and 2009 a clear increase in significance or influence of *BigBath it* and *IncSmoothit* was not noted. For both years the independent variable *BigBath it* was significant and did not reject hypothesis 1.0 ‘industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average’. The year after the start of the crisis showed a lower significant value and a smaller effect, from 0,279 in 2007 to 0,100 in 2009. These results indicate rejection of hypothesis 3.0, ‘Due to the crisis the incentive for management to perform earnings management has increased’.

The results of the regression analyses and the conclusions that can be drawn will be summarized in the following chapter.

# 8. Conclusion

This chapter will summarize and conclude the research which was performed in this thesis and will state this in relation to the formulated hypotheses and theoretical outcomes. This chapter will end with suggestions for future research coming forth from this thesis.

## 8.1 Conclusion

In the research performed the three hypotheses were tested. The outcome per hypothesis will be discussed:

*H1.0: Industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average.*

*H1.1: Industrial firms are not more likely to recognize a goodwill impairment loss when they perform below branch average.*

Equal to previous research, for both years 2007 and 2009 there is significant evidence that industrial firms are more likely to recognize a goodwill impairment loss when they perform below branch average. This provides further evidence that firms delay goodwill write-offs strategically for a certain period, when they know that their ratios are being scrutinized more securely by their shareholders. Therefore hypothesis 1.1 is rejected.

*H2.0: Industrial firms are more likely to recognize a goodwill impairment loss when they perform above branch average.*

*H2.1: Industrial firms are not more likely to recognize a goodwill impairment loss when they perform above branch average.*

There is no significant evidence that the industrial firms in the chosen sample which are performing above branch average are more likely to recognize a goodwill impairment loss. Therefore we fail to reject hypothesis 2.1 in favour of hypothesis 2.0 for both years.

*H3.0: Due to the crisis the incentive for management to perform earnings management has increased.*

*H3.1: Due to the crisis the incentive for management to perform earnings management has not increased.*

It was expected that the financial crisis would increase the effect of earnings management, if first proven by the hypotheses 1 and 2. However, the regression analyses over 2007 and 2009 showed no indications that the crisis had this effect.

Although for both years significant evidence was found to reject hypothesis 1.1; that industrial firms are not more likely to recognize a goodwill impairment loss when they perform below branch average, it was found that the significance and effect, on which this rejection was based, for the year 2009, the year after the beginning of the crisis, was less than the year before the crisis. This indicates that the crisis weakened the significance and effect. This could be caused by the declining trust of investors due to the start of the crisis and companies wanted to show as positive results as possible. Therefore the incentive to perform earnings management and take a big bath could have decreased.

For neither year significant evidence was obtained to support hypothesis 2.0. If the crisis however would increase the effect to perform earnings management the non-significance of the income smoothing variable would have decreased. Seen as the significance in 2009 decreased even further relating to 2007, no supporting evidence for an increased effect due to the crisis was noted.

Based on the above results we fail to reject hypothesis 3.1 in favour of hypothesis 3.0 for both hypothesis 1 and 2. No significant evidence is found that the crisis increased the incentive of management to make the decision to perform earnings management. Summarized and relating to the theoretical outcomes as presented in the appendix 2. Theoretical outcomes, number 16 represents the outcome of this thesis:

*Table 8.1 Result of thesis:*

|  |  |
| --- | --- |
|  | **16** |
|  | **Accepted** | **Rejected** |
| H1.0 - relating to 2007 | V |   |
| H1.0 - relating to 2009 | V |   |
| H3.0 > relating to H1 |   | v |
| H2.0 - relating to 2007 |   | v |
| H2.0 - relating to 2009 |   | v |
| H3.0 > relating H2 |   | v |

This is an interesting and relevant outcome because this indicates that due to the crisis the impairment of goodwill and therefore, the financial statements were not influenced by earnings management more than before the crisis.

## 8.2 Future research

To gain a better insight in the effects of the crisis on earnings management and to assess if the conclusions drawn in this thesis are just, the years 2007 and 2009 can be subjected to other kinds of research. In previous researches the effect of executive compensation and earnings management has been compared (Saih and Kanhai, 2010) and the effect of capital market pressures and institutional factors on firms’ incentives to perform earnings managements (Burgstahler et al, 2006). These researches can also be performed on years before and after the crisis to analyze the effects the crisis has on earnings management and therefore on the reliability of financial reporting.

This thesis researches earnings management by looking at the decision taken by management to perform impairment of goodwill. Further research can be performed by looking at the amount of impairment management takes.

This research can also be performed for other reporting standards. If the same research is performed in the United States, then, besides the effects of the crisis, also the effect of different reporting standards can be assessed on top of this.

# References

Alciatore, M., Dee, C.C., Easton, P., Spear, N. (1998), ‘Asset write-downs: A decade of research’, *Journal of Accounting Literature*, Vol. 17, pp. 1-39.

Barnea, A.J., Ronen, J., Sadan, S. (1976), ‘Classificatory Smoothing of Income with Extraordinary Items’, *The Accounting Review,* January, pp. 110-122.

Burgstahler, D., Hail, L., Leuz, C. (2006), ‘The importance of reporting incentives: Earnings management in European private and public firms’, *The Accounting Review*, Vol. 81, No. 5, pp. 983-1016.

Dye, R.A. (1988), Earnings Management in an Overlapping Generations Model*, Journal of accounting research*, Vol. 26, No. 2, pp. 195-235.

Elliott, J., Shaw, W. (1988), “Write Offs as Accounting Procedures to Manage Perceptions”, *Journal of Accounting Research*, Vol. 26, Supplement, pp. 91-119.

European Commission (2008), Report of the Commission to the Council and the European Parliament on the Operation of Regulation (EC) No 1606/2002 of 19 July 2002 on the application of international accounting standards. COM(2008) 215 final.

Eynde, K. van den, (2007), ‘Goodwill en fusies in het kader van IFRS 3’, *thesis major accounting and finance*, Universiteit Hasselt.

Fudenberg, K., Tirole, J. (1995), ‘A theory of income and dividend smoothing based on incumbency rents’, *Journal of Political Economy,* Vol*.* 103, pp. 75-93.

Han, J.C.Y., Wang, S. (1998), ‘Political Costs and Earnings Management of Oil Companies during the 1990 Persian Gulf Crisis’, *The Accounting Review*, Vol. 73, No. 1, pp. 103-117.

Hayn, C., Hughes, P.J. (2006) ‘Leading Indicators of Goodwill Impairment’, *Journal of Accounting, Auditing and Finance*, Vol. 21, No 3, pp. 223-265.

Healy, P.M., Wahlen, J.M. (1999), A review of the earnings management literature and its implications for standard setting, *Accounting Horizons*, Vol. 13, pp. 365-383.

Henning, S.L., Lewis, B.L., Shaw, W.H. (2000), ‘Valuation of the components of purchased Goodwill’, *Journal of Accounting Research,* Vol. 38, No. 2, pp. 375-386.

Henning, S.L., Shaw, W.H., Stock, T. (2004) ‘The Amount and Timing of Goodwill Write-offs and Revaluations: Evidence from U.S. and U.K. Firms’, *Review of Quantitative Finance and Accounting*, Vol. 23, pp. 99-121.

IASC Foundation Education, ‘Technical Summary IFRS 3 Business Combinations’ [http://www.iasb.org/NR/rdonlyres/73E562FE-F581-4DD4-8365-B17E228955C9/0/IFRS3.pdf] 27-7-2010.

Langmead, J.M., Soroosh, J. (2009), ‘International Financial Reporting Standards: The Road Ahead’, *The CPA Journal*, Vol. 79, No. 3, pp. 16-24.

Lapointe-Antunes, P., Cormier, D., Magnan, M. (2008), ‘Equity Recognition of Mandatory Accounting Changes: The Case of Transitional Goodwill Impairment Losses’, *Canadian Journal of Administrative Sciences*, Vol. 25, pp. 37-54.

Lemans, J.D. (2009), ‘Goodwill Impairment as a Tool for Earnings Management’, master thesis for the faculty of Economics and Business.

Masselink, M. and van den Noord, P. (2009) The Global Financial Crisis and its effects on the Netherlands, Ecfin Country focus, Volume 6, issue 10, 4-12-2009.

Mercer, Z.C., Crow, M.R., Patton, K.W. (2002), “Goodwill valuation under SFAS 142’ *The CPA Journal*, Vol. 72, No. 2, pp. 22-29.

Office for Official Publications of the European Communities, European Commission (2009), Annual Report on the Euro Area 2009, European Economy No 3/2009.

Ostende, van M.C., (2009), ‘Goodwill Impairment as a Tool for Earnings Management in Western and Middle European Union member states’, master thesis for the faculty of Economics and Business.

Palepu, K.G., Healy, P.M., Bernard, V.L., Peek, E. (2007), ‘Business analysis and evaluation (IFRS edition)’, pp. 434-449.

Poel, van de K., Maijoor, S., Vanstraelen, A. (2008), ‘Implementation of IFRS within Europe: the case of goodwill’ [http://aaahq.org/meetings/AUD2009/ImplementationOfIFRS.pdf] (10-08-2010).

Pownall, G., Wieczynska, M. (2012), ‘Deviations from the Mandatory Adoption of IFRS in the European Union: Implementation, Enforcement, Incentives, and Compliance’.

Praag, B. van (2001), ‘Earnings management: Empirical Evidence on Value Relevance and Income smoothing’, *Tinbergen Institute Research Series,* No. 251.

Ronen, J., Yaari, V. (2008), ‘Earnings management: Emerging insights in theory, practice, and research’, Springer US.

Saih, J., Kanhai, I. (2010), ‘Executive equity-based compensation and Earnings Management’.

Schipper, K. (1989), ‘Commentary on Earnings Management’, *Accounting Horizons,* Vol. 3, No. 4, pp. 91-102.

Seetharaman, A., Sreenivasan, J., Sudha, R., Yee, T.Y. (2006), ‘Managing impairment of goodwill’, *Journal of Intellectual Capital,* Vol. 7, No. 3, pp. 338-353.

Sevin, S., Schroeder, R. (2005), ‘Earnings management: evidence from SFAS No. 142 reporting’, *Managerial Auditing Journal,* Vol. 20, No 1, pp. 47-54.

Watts, R.L, Zimmerman, J.L. (1986), Positive Accounting Theory, *Prentice-Hall Inc*.

# Appendix

### 1. Use of options in the IAS Regulation by Member States


Source: European Commission (2008), Report of the Commission to the Council and the European Parliament on the Operation of Regulation (EC) No 1606/2002 of 19 July 2002 on the application of international accounting standards.

### 2. Theoretical outcomes:

As described in chapter 5.1, based on the 3 hypotheses, the possible theoretical outcomes of this thesis can be predicted. See below for all possibilities:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|  | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R |
| H1.0 -2007 | V |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  |
| H1.0 -2009 | V |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  |
| H3.0 > H1 | V |  | v |  | v |  | v |  | v |  | v |  | v |  | v |  |  | v |  | v |  | v |  | v |
| H2.0 -2007 | V |  | v |  | v |  | v |  |  | v |  | v |  | v |  | v | v |  | v |  | v |  | v |  |
| H2.0 -2009 | V |  | v |  |  | v |  | V | v |  | v |  |  | v |  | v | v |  | v |  |  | v |  | v |
| H3.0 > H2 | V |  |  | v | v |  |  | V | v |  |  | v | v |  |  | v | v |  |  | v | v |  |  | v |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|  | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R |
| H1.0 -2007 | V |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   |
| H1.0 -2009 | V |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |
| H3.0 > H1 |   | v |   | v |   | v |   | V | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   |
| H2.0 -2007 |   | v |   | v |   | v |   | V | v |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v |
| H2.0 -2009 | V |   | v |   |   | v |   | V | v |   | v |   |   | v |   | v | v |   | v |   |   | v |   | v |
| H3.0 > H2 | V |   |   | v | v |   |   | V | v |   |   | v | v |   |   | v | v |   |   | v | v |   |   | v |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R |
| H1.0 -2007 | V |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v |
| H1.0 -2009 |   | v |   | v |   | v |   | V |   | v |   | v |   | v |   | v | v |   | v |   | v |   | v |   |
| H3.0 > H1 |   | v |   | v |   | v |   | V |   | v |   | v |   | v |   | v | v |   | v |   | v |   | v |   |
| H2.0 -2007 | V |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v | v |   | v |   | v |   | v |   |
| H2.0 -2009 | V |   | v |   |   | v |   | V | v |   | v |   |   | v |   | v | v |   | v |   |   | v |   | v |
| H3.0 > H2 | V |   |   | v | v |   |   | V | v |   |   | v | v |   |   | v | v |   |   | v | v |   |   | v |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
|  | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R |
| H1.0 -2007 |   | v |   | v |   | v |   | V |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |
| H1.0 -2009 | V |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   |
| H3.0 > H1 | V |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |
| H2.0 -2007 |   | v |   | v |   | v |   | V | v |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v |
| H2.0 -2009 | V |   | v |   |   | v |   | V | v |   | v |   |   | v |   | v | v |   | v |   |   | v |   | v |
| H3.0 > H2 | V |   |   | v | v |   |   | V | v |   |   | v | v |   |   | v | v |   |   | v | v |   |   | v |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
|  | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R | A | R |
| H1.0 -2007 |   | v |   | v |   | v |   | V |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |
| H1.0 -2009 |   | v |   | v |   | v |   | V |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   | v |
| H3.0 > H1 | V |   | v |   | v |   | v |   | v |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v |
| H2.0 -2007 | V |   | v |   | v |   | v |   |   | v |   | v |   | v |   | v | v |   | v |   | v |   | v |   |
| H2.0 -2009 | V |   | v |   |   | v |   | V | v |   | v |   |   | v |   | v | v |   | v |   |   | v |   | v |
| H3.0 > H2 | V |   |   | v | v |   |   | V | v |   |   | v | v |   |   | v | v |   |   | v | v |   |   | v |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 61 | 62 | 63 | 64 |
|  | A | R | A | R | A | R | A | R |
| H1.0 -2007 |   | v |   | v |   | v |   | V |
| H1.0 -2009 |   | v |   | v |   | v |   | V |
| H3.0 > H1 |   | v |   | v |   | v |   | V |
| H2.0 -2007 |   | v |   | v |   | v |   | V |
| H2.0 -2009 | V |   | v |   |   | v |   | V |
| H3.0 > H2 | V |   |   | v | v |   |   | V |

A=Accepted, R=Rejected

### 3. Model as used by van the Poel et al. (2008):

$$IMP\_{it}=α\_{0}+α\_{1}GW\_{it-1}+α\_{2}SIZE\_{it}+α\_{3}∆indROA\_{it}+α\_{4}SALES\_{it}+α\_{5}∆CFO\_{it}+α\_{6}BATH\_{it}+α\_{7}SMOOTH\_{it}+α\_{8}BIG4\_{it}+α\_{9}BATH\_{it}\*BIG4\_{it}+α\_{10}SMOOTH\_{it}\*BIG4\_{it}+\sum\_{}^{}α\_{j}CONTROLS\_{itj}+ε\_{it}$$

IMPit = indicator variable (equal to one if impairment reported, else 0)

GWit-1 = ratio of firm i’s opening balance of goodwill on total assets

SIZEit = natural logarithm of firm i's total assets

ΔindROAit = the median change in firm i’s industry return on assets from period t-1 to t, where industry is defined on a 2-digit SIC level

ΔSALESit = firm i’s change in sales from year t-1 to year t, divided by total assets at the end of year t-1

ΔCFOit = 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

BATHit = 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)

SMOOTHit = 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)

BIG4it = indicator variable (equal to one in case of a Big 4 auditor, else 0)

### 4. Box plots:

2007 Sales before and after removal of outliers:
 

Removed outliers:

|  |  |  |
| --- | --- | --- |
| Entity Name: | Key: | Sales: |
| Heliocentris Fuel Cells | C900572985 | 4.660 |
| Optela-Laser Technologies AD | C000079196 | 1.974 |
| Payom Solar AG | C901942144 | 1.316 |
| Alapis SA | C000063502 | 995 |
| Acta Spa | C901875275 | 757 |
| Axlon Group AB | C901662872 | 460 |

2007 CFO before and after removal of outliers:
 

Removed outliers:

|  |  |  |
| --- | --- | --- |
| Entity Name: | Key: | CFO: |
| Elica Spa | C901024639 | 1.047 |
| Metka SA | C000008462 | 94 |
| Atari | C000087688 | 90 |

2009 Sales before and after removal of outliers:


Removed outliers:

|  |  |  |
| --- | --- | --- |
| Entity Name: | Key: | Sales: |
| Porsche Automobil Holding SE | C000087644 | 665 |
| Cellpoint Connect AB | C901687078 | -100 |

2009 CFO before and after removal of outliers:


Removed outliers:

|  |  |  |
| --- | --- | --- |
| Entity Name: | Key: | CFO: |
| Braime (TF & JH) Holdings PLC | C000054279 | 252 |
| Digital Identification Solutions AG | C902228634 | 65 |
| Oxford Instruments PLC | C000089195 | 61 |
| Peugeot SA | C000087703 | 56 |
| Easy Software AG | C000063628 | 49 |
| Euromedis Groupe | C000070585 | -46 |

2009 ROA before and after removal of outliers:


Removed outliers:

|  |  |  |
| --- | --- | --- |
| Entity Name: | Key: | ROA: |
| Shieldtech PLC | C902759539 | 331 |
| Cellpoint Connect AB | C901687078 | 288 |

### 5. Used Data: