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Goodwill and value creation of acquisitions

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Goodwill and value creation of acquisitions

Voor mijn ouders

Voor Peter, Emma en Siebren

Goodwill and value creation of acquisitions

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List of Abbreviations

AeA	American Electronics Association
APB	Accounting Principles Board
AMEX	American Stock Exchange
CEO	Chief Executive Officer
CRSP	Center for Research in Security Prices
FASB	Financial Accounting Standards Board
GAAP	Generally Accepted Accounting Principles
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IPRD	In-Process Research and Development
NASDAQ	National Association of Securities Dealers Automated Quotation system
NYSE	New York Stock Exchange
OLS	Ordinary Least Squares
PPE	Property, Plant and Equipment
R	Revised
SDC	Securities Data Company
SEC	United States Securities and Exchange Commission
SFAS	Statement of Financial Accounting Standards
SIC	Standard Industrial Classification
US	United States of America
US GAAP	United States Generally Accepted Accounting Principles



1 Introduction

1.1 MOTIVATION

Reporting on purchased goodwill in business combinations attracts a great deal of attention. One reason that lies behind this interest is the large number of mergers and acquisitions that have occurred in recent years, in which large amounts of money are involved. In 2007, global merger and acquisition volume totalled 4.38 trillion US dollars.¹ Although in 2008 due to the financial crisis this volume hit a three-year low, it still totalled about 2.89 trillion US dollars.² Furthermore, the Netherlands has not lagged behind. In 2007, 781 mergers and acquisitions occurred in the Netherlands, representing a total transaction value of 239 billion euros. Likewise, in 2008 the Dutch takeover market contracted considerably, but the number of mergers and acquisitions still amounted to 545 and represented a transaction value of 97 billion euros.³ This research shows that goodwill, on average, accounts for a considerable 62 percent of the transaction value. The acquisitions and the large amounts of purchased goodwill involved are often accounted for by the acquiring companies by arguments such as strategic importance, creation of economies of scale, or joining of forces. As the acquiring companies expect to gain additional profits in the future resulting from the acquisition, they are prepared to pay the high transaction values and the large amounts of goodwill. Goodwill then is regarded as the present value of these expected additional profits, which is called the economic approach to goodwill.

The question that arises is whether purchased goodwill actually represents this expected value creation.

Another important reason for the increasing interest in reporting on purchased goodwill in business combinations and for this research is that some important changes have taken place in the US regime [United States Generally Accepted Accounting Principles (US GAAP) 2001] as well as in Europe [International Financial Reporting Standards (IFRS) 2004]. Due to these changes, acquiring companies are obliged to provide more extended as well as more uniform information about their mergers and acquisitions. The new regimes require (i) all mergers and acquisitions to be accounted for under the purchase method of accounting; (ii) any purchased goodwill to represent the purchase price of the acquired firm minus the fair value of its net assets; (iii) identifiable intangible assets to be recorded separately, and

1 Reuters, press release 19 December 2007.

2 Claudiu Vranceanu, citing Thompson Reuters, 31 December 2008.

3 Overfusies.nl, press release 12 March 2009.

(iv) amortization of goodwill to be replaced by an annual impairment test. These new regulations will probably result in wider availability of data on purchased goodwill⁴ and in further subdivision of the purchase price into other assets acquired and debt assumed in the annual reports of the acquirer. Furthermore, due to the more stringent regulation, the information content of purchased goodwill may have increased: it may have become a more concise term that contains relevant information about expected value creation or synergy of the acquisition. The Financial Accounting Standards Board (FASB) stated that, by introducing the new regime, it aimed for better reflection of the underlying economics of acquired goodwill and other intangible assets, and a better understanding of the investments made in those assets and the subsequent performance of these assets by the financial statement users. It further intended to improve comparability of reported financial information and to provide more complete financial information.

The question that arises here is whether the new regulation did bring accounting goodwill, thus far viewed as a leftover amount that could not be identified as a separate tangible or intangible asset, more closely aligned to the economic approach to goodwill, in which goodwill is regarded as the present value of the expected additional profits from the acquisition.⁵

An implicit assumption made thus far is that merger bids are initiated by managers to create value. The efficiency theory then applies, stating that the combination will be more productive than the sum of its parts, due to synergy gains and improved managerial effectiveness of the target company. Previous research confirms the efficiency theory, but also shows that merger bids can be initiated by managers with motives other than creating value, such as empire-building and hubris.⁶ Most of the previous research into the efficiency theory and other theories explaining acquisitions made use of stock excess returns to measure value creation. This leads to another motivation: this research examines whether purchased goodwill may serve as an alternative measure of value creation to stock excess returns. To

4 Companies now are required to account for the acquisition under the purchase method, thereby showing purchased goodwill.

5 In finance literature [e.g. Rappaport (1998)] expected value creation is defined as the present value of expected incremental cash flows, taking into account uncertainty. In accounting literature, economic goodwill is defined as the present value of expected future additional profits [e.g. Johnson and Tearney (1993)]. In the first instance, the definition of economic goodwill seems to differ from expected value creation as defined in finance literature: in finance literature expected cash flows are mentioned and in accounting literature expected additional profits. However, according to the author, expected additional profits are to be read as expected future benefits. Moreover, both definitions are based on the same line of thought: future-oriented, based on expectations, and taking into account uncertainty. This is where finance and accounting connect.

6 An alternative theory that finds support is the empire-building theory, stating that acquisitions are planned and executed by the managers of the buyer's company in order to maximize their own utility instead of shareholder value. Further, previous research shows that the bargaining power plays a role when explaining stock excess returns.

determine whether goodwill provides information about value creation of the acquisition, it should be checked whether the characteristics of the efficiency theory also apply on purchased goodwill.

Then, the question that arises is: can purchased goodwill be explained from the characteristics of the efficiency theory?⁷

When compared to other studies of goodwill this dissertation is innovative in the following respects. It focuses on purchased goodwill in acquisitions instead of on the reported asset goodwill in the financial statements of a company created in the course of time (as some of the other studies do). It relates purchased goodwill to the value of transaction of the acquisition instead of to the market value of the acquiring company. Lastly, it examines whether this purchased goodwill resembles the expected value creation by these acquisitions.

1.2 GOAL AND RESEARCH QUESTIONS

The intention of this dissertation is to gain insight into the information content of purchased goodwill about the value creation of a business combination.

The *central question* to be answered in this research is:

Can goodwill under the new regime be a measure of value creation? In other words, did new regulation bring the accounting concept of goodwill closer to the economic approach to goodwill, in which goodwill is regarded as the present value of the expected additional profits from the acquisition?

This central question is split up into *two research questions*:

- (I) What is the effect of the new regulation standards on the amount of purchased goodwill in relation to the total purchase price for the acquisition?
- (II) Does goodwill under the new accounting regime provide information on expected value creation of the acquisition?

The *first research question* is answered by comparing information on purchased goodwill amounts. It is examined whether new regulation has led to more and more precise information about goodwill in the financial statements of the acquirers.

To answer the *second research question*, it is examined whether the known characteristics of value-creating acquisitions as conducted by the efficiency theory and proved by stock excess returns-analyses also apply on purchased goodwill. In these analyses the effect of characteristics of other theories

7 The research will control for other theories explaining goodwill.

explaining acquisitions on purchased goodwill as shown by excess returns-analyses are taken into account.

Consequently, the second research question leads into the following *sub-question*:

- (II) a What is the effect of the characteristics of the efficiency theory on purchased goodwill under the new accounting regime?

1.3 DEMARCATION OF THE RESEARCH

The research is demarcated to mergers and acquisitions between US publicly quoted companies, to which US GAAP apply. The decision to confine the research to the United States (US) situation has been made as changes in regulation took place first in the US, resulting in an earlier availability of data. By new regulation or a new accounting regime, new US GAAP on business combinations (SFAS 141 'Business Combinations') and intangibles (SFAS 142 'Goodwill and Other Intangibles') that became effective as from 2001 are mentioned. By old regulation or old accounting regime, US regulation regarding business combinations and intangible assets that was effective before new regulation came into force is mentioned: Accounting Principles Board (APB) Opinion No. 16 'Business Combinations' and APB Opinion No. 17 'Intangible Assets', respectively.

1.4 RESEARCH APPROACH

There are several approaches to accounting theory. This research falls within the market-based accounting research.⁸ The design of the research is in line with studies assessing the relationship between financial data from annual reports and stock returns. The difference is that in this research, stock returns are replaced by purchased goodwill.

1.5 SCIENTIFIC RELEVANCE

This dissertation adds to research literature in three respects:

- (1) Whereas most studies into acquisition theories are tested for these theories by using relationships between accounting reports and stock returns, in this research stock returns are replaced by purchased goodwill. The possibility of goodwill turning out to be an adequate alternative to stock returns when measuring value creation will be examined here.

8 See Beaver (1968) for a description of this line of research in more detail.

- (2) Thus far, most of the research into goodwill was about goodwill explaining market value or excess returns of the company.⁹ Market value and excess returns then were measured by stock prices or returns on stock prices. The studies were focused on the impact of the reported asset “goodwill” of a company on its market value (valuation analysis) or excess return (return analysis). An innovation of this dissertation is:
 - a. that it focuses on purchased goodwill in acquisitions instead of on the reported asset goodwill in the financial statements of a company created in the course of time, and
 - b. that it examines whether this purchased goodwill resembles the expected value creation by these acquisitions. So purchased goodwill is now used as a variable to be explained instead of as an explanatory variable.
- (3) The researcher believes that goodwill data on which the empirical research is based are unique. In current databases, no information regarding goodwill purchased in acquisitions can be found. Only information about goodwill as reported on the balance sheet of companies is available. The time-consuming search for purchased goodwill data in the notes to the consolidated financial statements of the acquiring companies makes this research the only one of its kind.

1.6 CONTENTS OF THE THESIS

The structure of the study is as follows:

Chapter 2 deals with the economic consequences of changes in accounting. It examines closely the changes of standards concerning reporting for business combinations and for purchased goodwill as formulated by the FASB and the International Accounting Standards Board (IASB) as well as their expected impact on the information content of goodwill. Further, the state of the art of research literature into goodwill will be discussed in this chapter.

Chapter 3 focuses on acquisition theories that may contribute to explaining goodwill. It summarizes the state of the art of research into these theories. Most of the research made use of stock returns of acquirer, target, or of a combination of both to measure value creation. The research literature explaining target returns and bid premiums from the acquisition theories is discussed in more detail, as it is assumed that goodwill moves in line with target returns and bid premiums. Based on the theories and outcomes of research literature into these theories, this chapter examines a selection of characteristics that seem to be relevant while investigating the value

⁹ See 2.7 for more details.

relevance of goodwill. These characteristics will be used in the empirical research of chapter 6.

In chapter 4, the data and the data descriptives are discussed. Supplementary to chapter 4, an appendix provides background information on the calculations of the stock excess returns as well as on the estimation of their significance.

Chapter 5 addresses the *first research question*. The impact of the new regime on accounting for purchased goodwill is empirically investigated. New and old regimes are compared regarding the amount of goodwill data available, relative amounts of purchased goodwill, and the availability of information on intangible assets, both before and after controlling for other characteristics. Then, regressions of relative amounts of purchased goodwill are performed, to test for the effects of the regime the acquisition is in and of separately reported intangible assets, thereby controlling for other characteristics that may be relevant.

Chapter 6 concerns the *second research question* and the corresponding *sub-question*. The research into goodwill measuring value creation of acquisitions is carried out in the following steps:

First, the relationship between goodwill and value creation of acquisitions is examined by correlating purchased goodwill to stock excess returns surrounding the acquisition announcement. This research measures how purchased goodwill corresponds to acquirer excess return amounts, target excess return amounts, and combined excess return amounts respectively.

Subsequently, bivariate analyses regarding correlations between relative goodwill, characteristics indicating value-creating acquisitions, and other characteristics affecting purchase price and goodwill will be carried out.

Then, multivariate analyses will be carried out; multivariate regressions of purchased goodwill on characteristics indicating value-creating acquisitions are performed, without as well as with control variables for other characteristics.

Chapter 7 is the closing chapter of this dissertation. It will summarize the main findings, discuss the limitations of the dissertation, provide some suggestions for future research, and present some policy implications.

Figure 1-I gives an overview of the structure of the research.

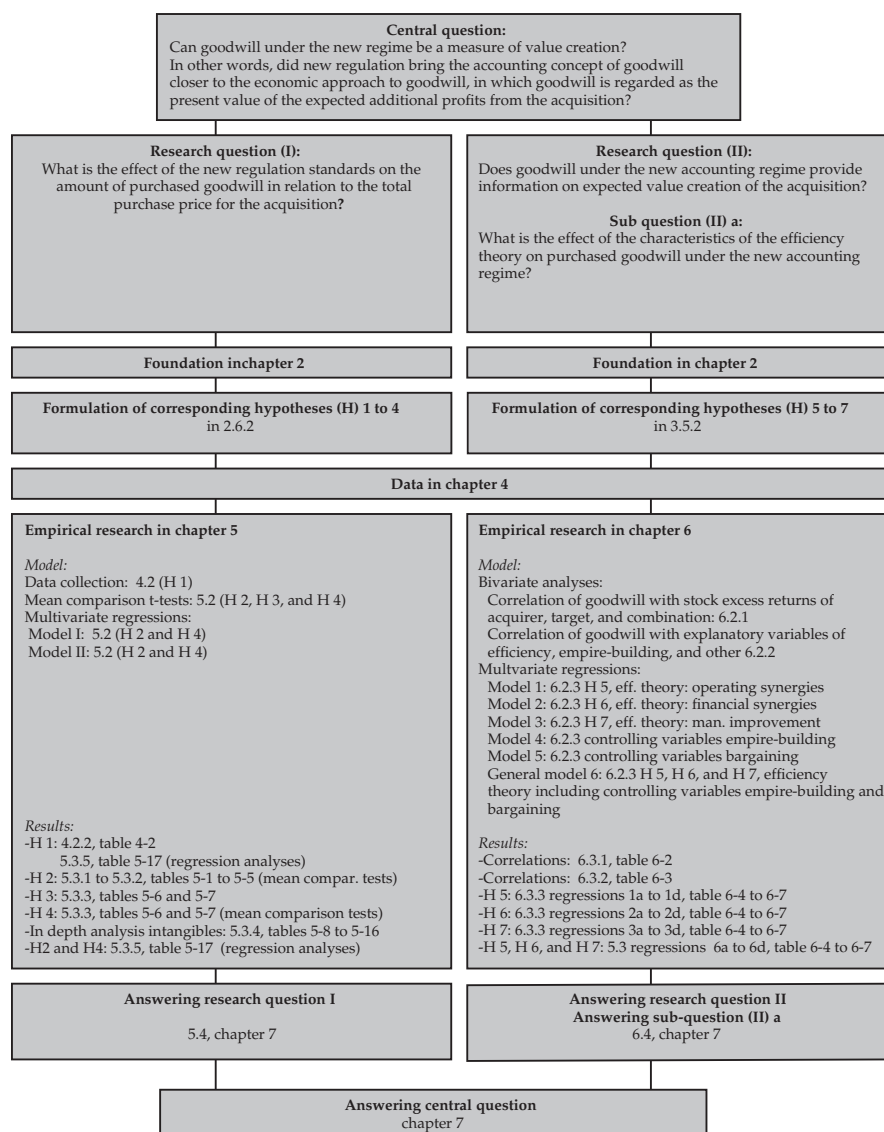


Figure 1-I: Structure of the research – a process model



2 Goodwill: economic consequences of changes in accounting

2.1 INTRODUCTION

At the beginning of the 21st century, some important changes were introduced in the international standards of accounting affecting reporting on goodwill. Nowadays, both US GAAP and IFRS require that in all mergers and acquisitions one of the merging firms is marked as the acquiring firm, and that purchased goodwill is entered as an asset on the balance sheet of the acquiring firm. Furthermore, goodwill no longer is allowed to be amortized. Instead, an impairment test must be carried out annually, and when necessary followed by an impairment. Besides, regulation concerning the recognizing of intangible assets has become tighter, which has an influence on the amount of reported goodwill.

This chapter closely examines US GAAP and IFRS affecting reporting on purchased goodwill. New US GAAP came into force earlier than IFRS. As more data were available at an earlier stage and also information regarding the old situation was available to compare, the focus of the empirical part of the research is on acquisitions between US companies.¹⁰ It therefore might seem reasonable just to focus attention on US GAAP in this chapter. However, it makes sense to discuss also IFRS, for as it turns out that new IFRS show many similarities with US GAAP, the outcomes of this research might be indicative for goodwill as reported by acquiring companies applying IFRS as well.

The structure of this chapter is as follows. In section 2.2, some definitions of goodwill will be discussed. This section draws special attention to the differences between the accounting concept of goodwill and the economic concept of goodwill. Section 2.3 gives a historical overview of US GAAP and IFRS insofar as they affect the amount and the definition of reporting on purchased goodwill. It deals with the methods of reporting on goodwill that were allowed in the past, and the changes that took place in the standards affecting purchased goodwill. In addition, it outlines the way in which goodwill now must be reported. Special attention will be drawn to the arguments for and against the different ways of reporting on goodwill put forward by literature, as well as to the reasoning underlying the changes as formulated by the standards setting boards. Next, section 2.4 examines the

10 Starting from 2005 the European Union requires all publicly quoted companies to apply IFRS. Until then, national regulation was allowed, resulting in inconsistent data difficult to access in the time period before new regulation. This called for research based on US data.

current standards regarding reporting on purchased goodwill in more detail. As IFRS show many similarities with US GAAP, this section reveals the main features of these standards simultaneously. Differences between these standards will be explained comprehensively. Recently, some new changes in US GAAP (2007) and in IFRS (2008) occurred. Although these changes are beyond the scope of the research, they are briefly discussed in section 2.5. In section 2.6, the possible impact of the new standards concerning reporting on purchased goodwill on the meaning of goodwill is discussed: it is argued that as a result of the new accounting regime as discussed in section 2.4, the accounting concept of goodwill *at least theoretically* grows closer to the economic concept of goodwill. Based on these arguments, the first four hypotheses of this research are formulated. Section 2.7 provides an overview of the state of the art of research into goodwill and stresses the added value of this research. To conclude with, section 2.8 provides a summary of the chapter.

2.2 DEFINITIONS OF GOODWILL

In this section, some definitions of goodwill are discussed. First, the accounting concept of goodwill and the economic concept of goodwill are further explained. It is clarified how accounting goodwill can be broken down into four components. Then, a division of goodwill into purchased goodwill and internally generated goodwill is made. Attention is paid to which of these items are to be reported.

2.2.1 Economic concept of goodwill and accounting concept of goodwill

Goodwill can be defined in various ways. Commonly, goodwill is regarded as the present value of the additional profits the acquiring company is expecting to gain in the future resulting from the acquisition. These additional profits arise from a “favorable attitude towards the firm”, when the target firm has good advertising and service, a reliable reputation, an attractive place of business, interesting customer lists, or competent employees and management. Further, additional profits are derived from synergies, such as economies of scale or technical and managerial skill transfer. This approach to goodwill is called the *economic concept of goodwill*. Johnson and Tearney (1993, 59) describe it as the *excess profits approach to goodwill*. According to these authors, this concept is difficult to measure since future earnings have no certainty. Myers (1977) in this context speaks of economic goodwill, which can be described as that proportion of the market value of the firm that cannot be explained by assets-in-place.

Besides the economic concept of goodwill, an *accounting concept of goodwill* can also be identified. From an accounting perspective, goodwill is the difference in valuation between the purchase price and the book value¹¹ of the acquired firm. In other words, the accounting concept of goodwill can be described as the surplus value above the shareholders' equity as shown in the balance sheet of the acquired company. Goodwill then is a leftover amount that cannot be identified, after a thorough investigation, as any other tangible or intangible asset. A synonym for the accounting concept of goodwill is the *residuum approach to goodwill*.¹²

Henning et al. (2000, 375-376) break down this accounting goodwill into four components: (1) write-up goodwill: the write-up of the target firm's assets to their fair market value, (2) going-concern goodwill: the value of the target as a going-concern, or stand-alone entity, (3) synergy goodwill: the synergistic value created by the acquisition, and (4) residual goodwill: any overvaluation of consideration and/or overpayment for the target.

An important characteristic of goodwill is that it should be inseparable from the business: it cannot be sold without selling the business that it is associated with. Johnson and Tearney (1993, 59) state that "if you can sell what you are calling goodwill, then it is something other than goodwill. It may be contract rights, a client list, distribution channels, or any number of other things and should be labeled as such, instead of lumped into the goodwill account."

2.2.2 Purchased goodwill and internally generated goodwill

The goodwill discussed so far, is purchased goodwill. Purchased goodwill arises when the acquiring company acquires the assets and liabilities or the shares of the acquired company, and is similar to the difference between the purchase price and the book value of the assets and liabilities or the shares of the acquired company.¹³ In contrast to purchased goodwill, there is also internally generated goodwill. Internally generated goodwill is described as internally created value resulting from contributions of the company itself to factors such as the above-mentioned good advertising and service, reliable reputation, attractive place of business, competent employees and management, or product recognition. In the past, in general both types of goodwill (internally generated goodwill as well as purchased goodwill) had been recorded as goodwill.¹⁴ However, whereas purchased goodwill is to be recognized in the consolidated balance sheet, it is not currently allowed to

11 i.e. the reported value of the target's assets less liabilities except for goodwill.

12 Johnson and Tearney, 1993, 59.

13 Blommaert and Kuijl, 2003, 5.

14 Johnson and Tearney, 1993, 59.

record internally generated goodwill in the consolidated balance sheet, as the standard-setting bodies assume that the internally generated goodwill often cannot be determined objectively by the company itself.¹⁵ Therefore, purchased goodwill also contains to large extent internally generated goodwill of the acquired company.

Reporting for purchased goodwill or the accounting concept of goodwill is further examined in sections 2.3 and 2.4 of this chapter.

2.3 REPORTING ON PURCHASED GOODWILL: A HISTORICAL OVERVIEW

This chapter provides a historical overview of reporting on purchased goodwill. Different methods of accounting for goodwill that were allowed in the past are discussed, as well as the advantages and disadvantages of these methods. It is further shown when those different methods were applicable, and what method is to be applied under the new accounting regime.

2.3.1 Accounting for purchased goodwill in the past: advantages and disadvantages

In the course of time, before recent new regulation on business combinations and related purchased goodwill came into effect, several methods of accounting for purchased goodwill were practised.

Accounting for purchased goodwill occurred when the business combination was accounted for by the purchase method. The different methods of accounting for purchased goodwill were:

- (I) to immediately adjust purchased goodwill against shareholders' equity (IAS until 1993);
- (II) to enter purchased goodwill as an asset on the balance sheet and to amortize it against earnings during its useful life (US GAAP until 2001, IFRS until 2004);
- (III) to charge the purchased goodwill immediately to income (US GAAP until 1971, IFRS until 1993).

For a long time it also had been possible not to report on purchased goodwill at all. This occurred when the new business combination was accounted for by the pooling of interests method. Therefore, a fourth method of (not) accounting on purchased goodwill was:

- (IV) the pooling of interests method, thereby not accounting for purchased goodwill at all (US GAAP until 2001, IFRS until 2004).

15 Blommaert and Kuijl, 2003, 5.

For each of the various ways of financial reporting on purchased goodwill or of not reporting on it a case can be made, but objections can also be raised. Below, for each method [(I) to (IV)] the arguments of application as found in literature are shown. The call for application of a certain method is often enforced by arguments against another method. Thus, between the lines, the arguments against each of the methods can also be read. Obviously, the arguments for and against the different ways of financial reporting on purchased goodwill must be placed within the moment in time during which they were made. In the course of time, points of view of quoted authors might have changed. For instance, in a changing economy in which high technology, know-how and services become more and more prominent, there is much to be said for an insightful position on purchased goodwill in the balance sheet. In addition, due to the tighter rules on separately recording purchased intangible assets other than goodwill, goodwill perhaps evolved into a more noteworthy item, worth recording separately on the balance sheet. Before these changes, authors were more inclined to regard goodwill as a residual, not worth mentioning as an asset on the balance sheet. As a result, at that time they called for an immediate writing-off of the full amount of purchased goodwill of equity or of net income. In this historical context, the arguments for and against the different ways of financial reporting on purchased goodwill can be read.

2.3.1.1 *Immediate adjustment against shareholders' equity*

The method in which purchased goodwill is immediately adjusted against shareholders' equity (in other words, purchased goodwill is deducted from shareholders' equity) is especially adhered to by purists. They claim that, as goodwill is not a separable asset, it does not belong on a balance sheet that, theoretically, comprises only separable assets and liabilities.¹⁶ Another argument in favor of this method is that the value of goodwill is too uncertain: to be on the safe side (prudence convention), it should therefore be immediately adjusted against shareholders' equity.¹⁷ Furthermore, it has been mentioned that the period of amortization of purchased goodwill is almost always arbitrary: "it scarcely even pretends to represent economic reality".¹⁸ Further, it has been stated that amortization of goodwill in consolidated financial statements may misrepresent the financial performance of the group.¹⁹ It has also been noticed that amortization of goodwill may induce manipulation of the profits recorded: an artificial increase of the price of acquired assets other than goodwill, that have a longer useful life than goodwill, will mitigate the influence of amortization of goodwill on profits.²⁰

16 Singleton-Green, 1998, 6; Hoogendoorn, 2002, 19.

17 Bindenga, 1991, 28-29; Dijkma, 2001, 36.

18 Singleton-Green, 1998, 6.

19 Hoogendoorn, 2002, 19.

20 Dijkma, 2001, 36.

A case can be made for immediate adjustment of purchased goodwill against shareholders' equity by arguing that when an acquired company accedes to a group, the financial performance of this new group should not be charged with settlements with earlier shareholders by way of amortization of goodwill.²¹ It can be further argued that as the purchase price of a target company is partly based on the estimated synergy effects of combining it with the acquiring company, the purchased goodwill should partly belong to the acquiring company itself. Therefore, it should not be recorded as an asset.

Moreover, it has been remarked that as goodwill in fact represents an expected payment of future additional profits to the shareholders of the company, this payment should be adjusted against shareholders' equity, like all other payments to shareholders.²² Next, it has been argued that as amortization of goodwill is not tax deductible, it is better to adjust goodwill immediately against shareholders' equity: profits then will not be influenced by the amortization.²³

2.3.1.2 *Entering as an asset and amortization*

Much to be recommended also is recording the purchased goodwill as an asset (the purchase method) on its balance sheet and amortizing it against earnings during its useful life. For instance, it has been argued that immediate adjustment of purchased goodwill against shareholders' equity harms the balance sheet as well as the leverage of the company: it could even result in a negative amount of shareholders' equity.²⁴ In addition, lower shareholders' equity recorded on the balance sheet of the acquired company leads to a higher return on equity ratio²⁵. In other words, different methods of recording of goodwill show different solvency and profitability ratios. It has been mentioned that using the method of immediate adjustment of purchased goodwill against shareholders' equity may even cause a risk of paying too large premiums when compared to the method of recording purchased goodwill as an asset, as short-term return on equity ratios improve.²⁶

Conversely, the takeover premium should in fact be recovered by expected future additional profits. This says much for the method of recording purchased goodwill as an asset on the balance sheet and amortizing it against earnings during its useful life.²⁷

21 Bindenga, 1991, 28-29.

22 Hoogendoorn, 2002, 19.

23 Bakkeren, 2002, 53.

24 Dijkma, 2001, 36-37; Bakkeren, 2002, 53.

25 Return on equity then is measured as net income as a percentage of shareholders' equity (e.g. Brealey et al., 2009, 84).

26 e.g. Ellis, 2001, 104.

27 Bakkeren, 2002, 53.

Another argument in favor of this method is that recording of goodwill improves the insight of stakeholders of the firm into the purchase price of the acquisition as well as into its composition: the firm's management then needs to account for the goodwill amount paid more precisely, also due to the more extended requirements regarding the disclosure of information when applying this method.²⁸

2.3.1.3 *Immediate chargement of goodwill to income*

The effect of immediately charging goodwill to income in the year of the acquisition is comparable to the effect of immediate adjustment of purchased goodwill against shareholders' equity. After all, charging goodwill decreases income, resulting in lower shareholders' equity. So, the arguments for and against immediate chargement to income correspond to the advantages and disadvantages of immediate adjustment against shareholder's interest. Another argument against this method is that it gives a fluctuating picture of the income, because of the downsizing effect on income in the year of acquisition. This is inconsistent with the matching principle.

2.3.1.4 *Pooling of interests*

The pooling of interests method used to be allowed for combinations classified as uniting of interests. When applying the pooling of interests method, the balance sheets of the two merging companies are added together, in that the assets and liabilities as well as the common stock and retained earnings accounts of the combined firm are the sum of their previous book values. Differences between the prices paid for the companies and their book values (purchased goodwill) then are not shown in the balance sheet of the combined firm and therefore can only be retrieved with difficulty.²⁹

Almost the same arguments for and against immediate adjustment of purchased goodwill against shareholders' equity hold for the pooling of interests method. A further argument mentioned against the application of the pooling of interests method is that it does not show any information about the amount of purchased goodwill at all.

2.3.2 *Changes in reporting on purchased goodwill*

Table 2-1 summarizes the relevant changes in US and IFRS regulation that have been made in the course of time, and, resulting from this, the different methods of reporting on purchased goodwill that were laid down by the

²⁸ Singleton-Green, 1998, 6; Ellis, 2001, 104-105.

²⁹ Anthony et al., 2003, 373-374.

different standards then. The table demonstrates that, in general, the FASB is the first to change the relevant standards. The IASB, aiming to achieve convergence in accounting standards around the world and, in doing so, also joining with the SFAS, is next. Table 2-1 further shows that in 2001 in US GAAP and in 2004 in IFRS some major changes were carried through have had an important effect on reporting on purchased goodwill. In the US the relevant standards involved are SFAS 141 'Business Combinations' (2001), superseding APB Opinion no. 16 'Business Combinations' (1970), and SFAS 142 'Goodwill and Other Intangible Assets' (2001), replacing APB Opinion no. 17 'Intangible Assets' (1970). The relevant new IFRS standards are IFRS 3 'Business Combinations' (2004), which replaces IAS 22R 'Business Combinations' (1998), revised IAS 36 'Impairment of Assets' (IAS 36R, 2004), and revised IAS 38 'Intangible Assets' (IAS 38R, 2004).

Some significant features of these standards are that:

- all business combinations must be accounted for using the purchase method, in which purchased goodwill has to be entered as an asset;
- the annual impairment test replaces amortization of goodwill:
 - amortization of goodwill is prohibited;
 - goodwill must be tested for impairment annually or more frequently if events or changes in circumstances indicate a possible impairment;
- intangible items acquired in a business combination must be recognized as assets separately from goodwill if they meet the definition of an asset, are separable or arise from contractual or other legal rights.

In the next section, these changes as well as the reasons why the standard setting bodies implemented these changes are further explained.

Table 2-1: Changes in reporting standards regarding purchased goodwill and business combinations

	US GAAP	IFRS
GOODWILL		
Initial recognition		
Immediate adjustment against shareholder interests	From 1970 prohibited	From 1993 prohibited
Purchase method	From 2001 obliged	From 2004 obliged
Immediate chagement to income	From 1970 prohibited	From 1993 prohibited
Pooling of interests method	From 2001 prohibited	From 2004 prohibited
Subsequent recognition		
Amortization of goodwill (in case of purchase method)	Until 2001 required From 2001 prohibited	Until 2004 required From 2004 prohibited
Impairment test of goodwill		
Annual	From 2001 required	From 2004 required
When indication of impairment	From 2001 required	From 1998 required

	US GAAP	IFRS
ACQUIRED ASSETS AND LIABILITIES		
Valuation of assets acquired and liabilities assumed Fair value Carrying value	From 2001 required Until 2001 obliged in case of pooling of interests accounting From 2001 prohibited	From 2004 required Until 2004 obliged in case of pooling of interests accounting From 2004 prohibited
INTANGIBLE ASSETS		
Initial recognition	Until 2001: separate reporting on acquired intangible assets when identifiable and nameable From 2001: separate reporting when in accordance with (1) contractual legal criterion or (2) separability criterion	Considerable changes in 1998 further adjustments in 2004 From 2004: separate reporting when in accordance with (1) contractual legal criterion or (2) separability criterion
Subsequent recognition	From 2001 in case of intangible assets with indefinite life time replacement of amortization by impairment test	From 2004 in case of intangible assets with indefinite life time replacement of amortization by impairment test

2.4 NEW REGULATION AFFECTING REPORTING ON PURCHASED GOODWILL: FEATURES AND ARGUMENTS

In this section, the above-mentioned significant features of the changed US GAAP (effective since 2001) and IFRS (effective since 2004) regarding financial reporting affecting goodwill are specified in more detail.³⁰ As US GAAP and IFRS standards show many similarities, they are discussed simultaneously. Special attention is paid to possible differences between the standards. Further, the motives for these changes are discussed.

2.4.1 Purchase method for all business combinations

2.4.1.1 Features

Whereas APB Opinion No. 16 and IAS 22R (1993) had already reduced the number of methods of reporting on goodwill to two [namely no goodwill reporting when the new business combinations were classified as uniting of

30 The relevant standards are: SFAS 141: Business Combination (2001), and SFAS 142: Goodwill and other Intangible Assets (2001) regarding US GAAP; IFRS 3: Business Combinations (2004), IAS 36R: Impairment of Assets (revised 2004), and IAS 38R: Intangible assets (revised 2004) regarding IFRS.

interests and thus applied the pooling of interests method (see 2.3.1.4), and entering purchased goodwill as an asset for all other business combinations that had to apply the purchase method (see 2.3.1.2)], under SFAS 141 and IFRS 3, all business combinations must now be accounted for using the purchase method only, in which goodwill has to be entered as an asset.³¹ Other methods are no longer permitted. Business combinations can be described as the bringing together of separate entities or businesses into one reporting entity.³² An important characteristic is that one entity obtains *control* over the acquired entity or entities, either by acquiring net assets, or by acquiring equity interests.³³ Requiring the purchase method as the only method means that it is implicitly assumed that virtually all business combinations are acquisitions.³⁴

The standards now prescribe for all business combinations that the acquirer recognizes the target's identifiable assets and liabilities at their *fair values*³⁵ at the acquisition date, and also recognizes *purchased goodwill*.³⁶ SFAS 141 even gives general guidance for determining the fair values of assets acquired and liabilities assumed, other than goodwill.³⁷ Also intangible assets should be taken into consideration. These will be discussed in section 2.4.3.

A special position is occupied by negative goodwill. Neither SFAS 141 nor IFRS 3 permit acquiring firms to record negative goodwill on the balance sheet. SFAS 141 prescribes that negative goodwill should be allocated as a *pro rata* reduction to the amounts assigned to the assets.³⁸ Any remaining excess shall be recognized as an extraordinary gain.³⁹ IFRS 3 requires that the amount of negative goodwill must be recognized by the acquirer immediately in profit or loss.⁴⁰

31 See SFAS 141-13 (2001), IFRS 3.1 (2004), and IFRS 3.14 (2004) for more details. Some minor exceptions are made in SFAS 141: 9-12 (2001), and in IFRS 3-3 (2004).

32 IFRS 3, 2001, definitions.

33 SFAS 141.9, 2001.

34 SFAS 141, 2001, summary.

35 IFRS 3 (2004, appendix A, defined terms, 36) describes the fair value of an asset as "the amount at which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction". Also before the standards were changed, acquiring companies were obliged to record the acquired assets and liabilities at their fair value, when the purchase method was adopted. However, in case of the pooling method, companies were not required to record the assets and liabilities at fair value.

36 See SFAS 141-13 (2001), SFAS 141-35 (2001), IFRS 3-1 (2004), IFRS 3-36 (2004), and IFRS 3-51 (2004).

37 SFAS 141-37, 2001.

38 SFAS 141-44, 2001.

39 SFAS 141-45, 2001.

40 To be precise, it requires that if, at the acquisition date, the acquirer's interest in the net fair value of the acquiree exceeds the cost of the combination, the acquirer is required to reassess the identification and measurement of the acquiree's identifiable assets, liabilities and contingent liabilities and the measurement of the cost of the combination. Any excess remaining after that reassessment must be recognized by the acquirer immediately in profit or loss (IFRS 3.56, 2004).

2.4.1.2 Motives

Important reasons for allowing only the purchase method were⁴¹ (I) a better reflection of the investment made in an acquired entity, (II) an improvement of the comparability of reported financial information, and (III) provision of more complete financial information. These reasons are explained below in more detail.

I. Better reflection of the investment made in an acquired entity

FASB states that “the purchase method records a business combination based on the values exchanged, thus users are provided information about the total purchase price paid to acquire another entity, which allows for more meaningful evaluation of the subsequent performance of that investment. Similar information is not provided when the pooling method is used.”⁴²

II. Improvement of the comparability of reported financial information

An important reason behind the decision of the two Boards to permit only the purchase method was that users of financial statements indicated that due to the different methods of accounting for business combinations, it was difficult to compare the financial results of entities. The assets acquired and liabilities assumed are now recognized and measured in the same way. They all have to be accounted for according to their fair value. Also the range of assets acquired and liabilities assumed that the acquiring company should account for is the same: for instance, intangible assets have to be accounted for separately when they meet certain requirements. Now that the pooling method is lost, acquiring companies can no longer omit these facts. It will result in an improved comparability of the financial figures of acquisitions. Although at the time it was required by the Boards that the pooling of interests method was applied by combinations classified as uniting of interests, the underlying criteria that were to be met in order to be classified as a uniting of interests did not distinguish economically dissimilar transactions: similar business combinations were accounted for using different methods that produced dramatically different financial statement results.⁴³ The differences between the methods even affected competition in the markets for mergers and acquisitions.⁴⁴

III. Provision of more complete financial information

This third argument is related to the further improvements in the standards in addition to the compulsory purchase method. “The explicit criteria for recognition of intangible assets apart from goodwill and the expanded

41 These reasons were derived from SFAS 141, 2001. The IASB gives comparable reasons (IFRS 3: IN2-IN3, 2004).

42 SFAS 141, 2001, summary, 6.

43 SFAS 141, 2001, summary.

44 SFAS 141, 2001, summary; IFRS 3, 2004, Introduction IN2 and IN3.

disclosure requirements provide more information about the assets acquired and liabilities assumed in business combinations. That additional information should, among other things, provide users with a better understanding of the resources acquired and improve their ability to assess future profitability and cash flows."⁴⁵

2.4.2 Annual impairment test replaces amortization of goodwill

2.4.2.1 Features

A major change concerning the reporting on purchased goodwill is the introduction of an annual impairment test, which replaces the annual amortization of goodwill. The old standards already required the company to conduct an impairment test whenever there was an indication that reported goodwill might be impaired.⁴⁶ Under the new standards, amortization of goodwill and other intangible assets with indefinite useful lives is prohibited. Instead they must be tested for impairment annually, or more frequently if events or changes in circumstances indicate a possible impairment.⁴⁷

As goodwill cannot generate cash inflows independently from those from other assets, the impairment test needs to be conducted for a larger reporting unit to which goodwill belongs.

As soon as the carrying value of this reporting unit (US GAAP) or cash-generating unit (IFRS) exceeds its fair value (US GAAP) or recoverable amount (IFRS), an impairment of goodwill against income is required. Although both standards, IFRS as well as US GAAP, are on the whole in agreement with each other regarding the line of reasoning behind the impairment tests, the tests themselves differ somewhat from each other with respect to content. Therefore, they will be discussed separately.

Regulation IASB in detail: IAS 36R 'Impairment of Assets' (2004)

IAS 36R 'Impairment of Assets' (2004) also applies to goodwill acquired in a business combination. As acquired goodwill cannot generate cash inflows independently from those other assets, it must be allocated to one or more cash-generating units or groups of cash-generating units from the acquiring company that are expected to benefit from the synergies of the combination.⁴⁸ A cash-generating unit can be described as the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets.⁴⁹ The cash-generating unit (or

⁴⁵ SFAS 141, 2001, summary, 7.

⁴⁶ IAS 36, 1998.

⁴⁷ SFAS 142-18, 2001; SFAS 142-26, 2001; IFRS 3.55, 2004; IAS 36R-10, 2004.

⁴⁸ The allocation is irrespective of whether other assets or liabilities of the acquired firm are assigned to those units or groups of units (IAS 36R-80, 2004).

⁴⁹ IAS 36R-6, 2004.

smallest group of cash-generating units) to which the goodwill has been allocated shall be tested for impairment annually, and whenever there is an indication that the unit may be impaired.⁵⁰ The impairment test is conducted by comparing the carrying amount of the unit, including the goodwill, with its recoverable amount.⁵¹ Sometimes, goodwill relates to a cash-generated unit but cannot be allocated to that unit.⁵² Such a unit shall be tested for impairment, whenever there is an indication that the unit may be impaired, by comparing the unit's carrying amount, excluding any goodwill, with its recoverable amount.⁵³ In such a case, goodwill can usually be allocated to a larger group of cash-generating units. Then the carrying amount of this larger group, including the allocated goodwill, shall be compared with its recoverable amount.

Table 2-2 summarizes the above-mentioned as follows.

Table 2-2: Impairment and allocation of impairment loss for cash-generating units according to IAS 36R 'Impairment of Assets' (2004)

	(I) Goodwill can be allocated to cash generating unit to which it belongs	(II) Goodwill cannot be allocated to cash generating unit to which it belongs
Characteristics Cash-generating unit	Cash generating unit or smallest group of units related to goodwill to which allocation of goodwill is possible	– Cash generating unit related to goodwill – Allocation of goodwill to unit not possible=> goodwill shall be allocated to a larger cash generating unit, or a group of units (see (I))
Impairment test: when?	– Annually – Indication of impairment	Indication of impairment
Impairment test: how?	Comparing unit's carrying amount, including goodwill, with its recoverable amount	Comparing unit's carrying amount, excluding goodwill, with its recoverable amount
Impairment: when?	Carrying amount unit(s) > recoverable amount unit(s)	Carrying amount unit > recoverable amount unit
Impairment: how?	Reduction of the carrying amount of (a) first goodwill allocated to the cash- generating unit (or group of units) (b) the other assets <i>pro rata</i>	Reduction of the carrying amount of the assets <i>pro rata</i>

⁵⁰ Some examples of indications are shown in IAS 36R-12, 2004.

⁵¹ IAS 36R-90, 2004.

⁵² IAS 36R-81, 2004.

⁵³ IAS 36R-88, 2004.

The term 'recoverable amount' requires some further explanation. In estimating the 'recoverable amount' of a cash-generating unit, its value in use as well as its fair value less costs to sell need to be measured. The value in use is described as the present value of the future cash flows expected to be derived from the cash-generating unit.⁵⁴ The fair value less costs to sell is defined as the amount obtainable from the sale of an asset or cash-generating unit in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal. The recoverable amount of the cash-generating unit is the higher of its fair value less costs to sell and its value in use.⁵⁵

If the recoverable amount of the unit exceeds the carrying amount of the unit, the unit and the goodwill allocated to that unit shall be regarded as not impaired. But if the carrying amount of the unit exceeds its recoverable amount, an impairment loss shall be recognized.⁵⁶ The impairment loss then needs to be allocated to reduce the carrying amount of the assets of the cash-generating unit. First, the carrying amount of any goodwill allocated to the cash-generating unit will be reduced. Then, the other assets of the unit are reduced on the basis of the carrying amount of each asset in the unit.⁵⁷

To summarize, in diagram form the impairment test of IAS 36R is as follows (see Figure 2-I).

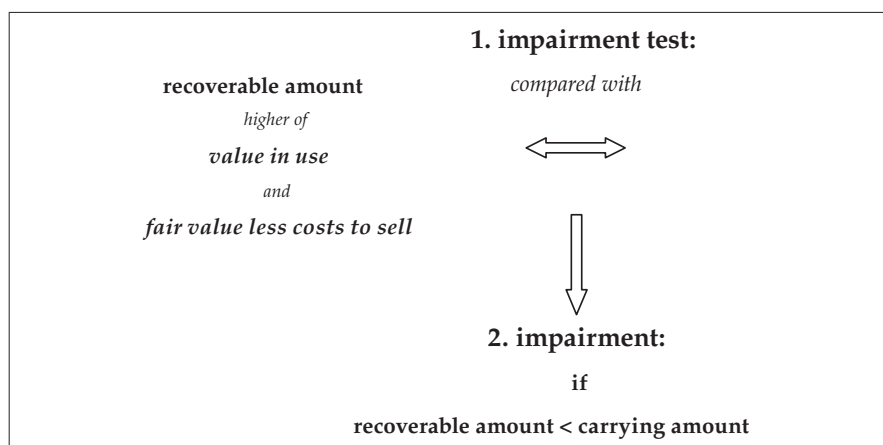


Figure 2-I: Impairment test and impairment in general (IAS 36R, 2004)

Regulation FASB in detail: SFAS 142 'Goodwill and Other Intangibles' (2001)

The relevant US standards about impairment of goodwill are classed in SFAS 142 'Goodwill and other Intangible Assets'. The standards are largely similar

54 IAS 36R (2004) gives directions in how to measure the value in use (IAS 36R-30 until IAS 36R-57).

55 These three definitions are derived from IAS 36R-6, 2004.

56 IAS 36R-90, 2004.

57 IAS 36R-104, 2004.

to IAS 36R, but there are some remarkable differences as well. The main distinguishing characteristics relate to:

- the use of the term 'reporting unit' instead of cash-generating unit,
- the largely omitted value in use when assessing the value of the reporting unit, and
- a separate calculation of a so-called implied fair value of goodwill when assessing whether an impairment of goodwill is due.

Reporting unit

Whereas IAS 36R requires goodwill to be allocated to a cash-generating unit, according to SFAS 142 goodwill needs to be allocated to a reporting unit.⁵⁸ A *reporting unit* can be described as an operating segment or a component of an operating segment. Such a component is a reporting unit if it constitutes a business for which discrete financial information is available and segment management regularly reviews the operating results of that component. However, aggregate components need to be classed under one reporting unit if the components have similar economic characteristics.⁵⁹ With respect to content, a reporting unit and a cash-generating unit hardly appear to differ from each other except in name.

Fair value

SFAS 142 requires an impairment test of goodwill to be conducted in two steps. In the *first step* the fair value of the reporting unit to which goodwill belongs needs to be compared with its carrying value, including goodwill.⁶⁰ If it seems that the fair value of the reporting unit exceeds its carrying amount, an impairment of goodwill will not take place. But if it seems that the carrying amount of the reporting unit exceeds its fair value, a second step needs to be taken. This *second step* compares the carrying amount of goodwill with its implied fair value. If the carrying amount of goodwill exceeds its implied fair value, an impairment loss equal to that excess is due.⁶¹ Goodwill will then be impaired to the lower implied fair value. A remarkable difference with IAS 36R is that the terms 'recoverable amount' and 'value in use' are not mentioned. In fact it is only required that the *fair value* of the reporting unit to which goodwill belongs is estimated: the amount at which the reporting unit as a whole could be bought or sold in a current transaction between willing parties.⁶² Quoted market prices in active markets are considered to be the best estimates of this fair value. Only when available market prices may not be representative⁶³ do they not act as the sole measurement basis of the fair value of the reporting unit.⁶⁴ In such a

58 SFAS 142-34, 2001.

59 SFAS 142-30, 2001.

60 SFAS 142-19, 2001.

61 SFAS 142-20, 2001.

62 SFAS 142-23, 2001.

63 For instance when only quoted market prices of separate equity securities are available.

64 SFAS 142-24, 2001.

situation a combination of the fair value measurement together with other measures is necessary, such as present value techniques or multiples of earnings.⁶⁵ Another striking difference with IAS 36R is that SFAS 142 prescribes that when present value techniques are to be used, the estimates of the future cash flows should incorporate in the first instance assumptions that marketplace participants use in their estimates of fair value. Only if these assumptions are not available may the firm's management use its own assumptions. On the contrary, the estimation of 'value in use' as required by IAS 36R is directly based on expectations of the firm's management.

Implied fair value of goodwill

In assessing whether an impairment of goodwill should take place, the so-called implied fair value of goodwill needs to be determined separately and compared with its carrying value.

First step: compare fair value of reporting unit with its carrying value, including goodwill;

- ⇒ If fair value > carrying value => stop, no impairment;
- ⇒ If fair value < carrying value => second step;

Second step:

- ⇒ allocate fair value of reporting unit to its assets and liabilities;
- ⇒ determine implied fair value of goodwill = excess of fair value of the reporting unit over fair value assigned to assets and liabilities;
- ⇒ if implied fair value of goodwill < carrying value of goodwill => reduce goodwill to lower implied fair value (impairment of goodwill).

Figure 2-II: *Impairment and allocation of impairment loss for reporting units according to SFAS 142*

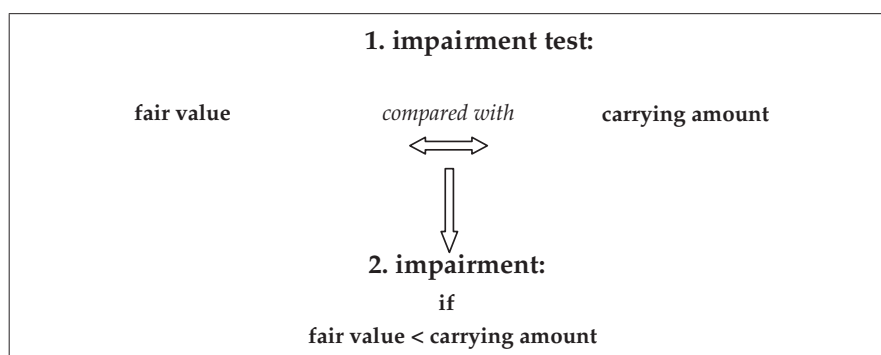


Figure 2-III: *Impairment test and impairment in general according to SFAS 142*

65 SFAS 142-25, 2001.

After determining the fair value of the reporting unit to which goodwill belongs, a company needs to allocate the fair value of this reporting unit to all the assets and liabilities of the reporting unit as if the reporting unit was acquired in a business combination and the fair value was the price paid in the acquisition. The implied fair value of goodwill can then be described as the excess of the fair value of the reporting unit over the fair value assigned to its assets and liabilities.⁶⁶ As discussed before, SFAS 142 requires that if the carrying amount of goodwill exceeds its implied fair value, an impairment loss equal to that excess is due.⁶⁷ IAS 36R does not require a separate estimation of the implied fair value of goodwill: when the cash-generating unit seems to be impaired, the carrying amount of the goodwill allocated to this unit needs to be reduced (maximum amount of reduction = carrying amount of goodwill).

Figure 2-II and Figure 2-III summarize the required two steps of the impairment test and of impairment of goodwill as required by SFAS 142.⁶⁸

2.4.2.2 *Motives*

One of the objectives of the new standards regarding impairment of goodwill and the prohibition of amortization of goodwill is to improve the quality of the accounting for goodwill acquired in business combinations.⁶⁹ The underlying thought is that it is no longer presumed that goodwill is a wasting asset: goodwill is assumed to have an indefinite life.⁷⁰ The standard-setting bodies expect that under the new standards, the financial statements will better reflect the underlying economics of the acquired goodwill. It is assumed that users will now better understand the investments made in these assets as well as the subsequent performance of these investments.⁷¹

Eeftink et al. (2002) add a political argument as well: SFAS 142 became effective at the same time as SFAS 141: 'Business Combinations'. This new statement prohibits the 'pooling of interests' method, in which no goodwill is recorded and therefore amortization of goodwill against income is omitted. The authors argue that the abolition of the 'pooling of interests' method in SFAS 141 has been compensated for by replacing the systematic amortization of goodwill by an annual impairment test, in that a yearly amortization of goodwill against income is no longer obligatory.

⁶⁶ SFAS 142-21, 2001.

⁶⁷ SFAS 142-20, 2001.

⁶⁸ SFAS 142-20, 2001.

⁶⁹ IAS 36R, 2004, Introduction, IN2.

⁷⁰ SFAS 142, 2001, summary.

⁷¹ SFAS 142, 2001, summary, 2.

2.4.2.3 Objections

In literature, several comments on these new standards can be found. One of the arguments against these new standards replacing the amortization of goodwill is that purchased goodwill and internally generated goodwill⁷² can be tied up with each other.⁷³ The new system of annual impairment tests will implicitly result in the recording of internally generated goodwill on the balance sheet of the acquiring company, which in fact is prohibited. After all, as the fair value (or recoverable amount) of the reporting unit (or cash generating unit) to which the goodwill belongs is measured, the internally generated goodwill will be part of this valuation as well. Other critical factors that are mentioned are the assignment of goodwill to an appropriate reporting unit (or cash-generating unit)⁷⁴ and the assumptions that are made when calculating the recoverable amount of the reporting unit to which the goodwill belongs: minor deviations in estimations of the cost of capital and of future cash flows can bring about huge deviations in the recoverable amount of the cash-generating unit. In addition, in assessing whether there is any indication that goodwill may be impaired, different judgements may appear.

2.4.3 Acquired intangible assets must be recorded separately

2.4.3.1 Features

When reporting on mergers and acquisitions, the acquiring company needs to recognize intangible assets of the target separately from goodwill, if they meet certain conditions.⁷⁵ The standards SFAS 141 and IFRS 3 address SFAS 142 'Goodwill and Intangible Assets' and IAS 38R 'Intangible assets', which have tightened up the requirements regarding the recognizing of acquired intangible assets in the financial statements of the acquiring company. The changes that have been made in the standards are primarily concerned with clarifying (a) the 'identifiability', and (b) the useful life and the related amortization of intangible assets and will be discussed below.

⁷² As noted in 2.2.2, it is not allowed to record internally generated goodwill.

⁷³ Hoogendoorn, 2002, 19; Eeftink et al., 2002, 30-31.

⁷⁴ In this context, King (2001) mentions that firms with a relatively large organic grow will impair less than firms that grew particularly by acquiring other companies: the reporting units of the former ones will contain a relatively large component of internally generated goodwill, which is not recorded on the balance sheet of the acquiring company. However, when an impairment test is exercised, and the recoverable amount or fair value of the reporting unit (or cash generating unit) is measured, this internally generated goodwill implicitly forms part of this measurement. A reduction in value of the recorded acquired goodwill will then be compensated for by this unrecorded internally generated goodwill.

⁷⁵ SFAS 141-39, 2001; IFRS 3-45, 2004.

The identifiability of intangible items

IAS 38R states that intangible items acquired in a business combination are to be defined as intangible assets if they meet three conditions: (1) they are identifiable, (2) the entity controls the intangible items, and (3) future economic benefits will probably flow from these items.⁷⁶

An intangible item meets the identifiability criterion when it is separable from the firm, or when it arises from contractual or other legal rights.⁷⁷

The firm is expected to control an intangible asset if it has the power to obtain the future economic benefits that flow from these items and if it is able to restrict the access of others to these benefits.⁷⁸ Examples of future economic benefits following from an intangible asset may be revenues from the sale of products or services, or cost savings.⁷⁹

Further, it is stated that an intangible asset shall only be recognized if it is probable that the expected future economic benefits that are attributable to the asset will flow to the entity, and the cost of the asset can be measured reliably.⁸⁰ If an intangible asset is acquired as part of a business combination, the recorded cost of that intangible asset needs to be its fair value at the acquisition date.⁸¹

SFAS 142 is in line with IAS 38R. However, in SFAS 142 the requirement of future economic benefits flowing into the firm is not that explicitly mentioned.⁸²

Useful life and amortization of intangible assets

The new standards distinguish intangible assets with finite useful lives from intangible assets with indefinite useful lives. An intangible asset is regarded as having an indefinite useful life if there is no limit to the period over which the asset is expected to generate net cash inflows for the entity.⁸³ Whereas an intangible asset with a finite useful life shall be amortized during its useful life,⁸⁴ an intangible one with an indefinite useful life shall not.⁸⁵ Instead, the latter needs to be tested for impairment annually.⁸⁶

Figure 2-IV briefly summarizes the requirements regarding intangible items.

76 IAS 38R-10, 2004.

77 IAS 38R-12, 2004.

78 IAS 38R-13, 2004.

79 IAS 38R-17, 2004.

80 IAS 38R-21, 2004.

81 SFAS 142-9, 2001; IAS 38R-33, 2004.

82 SFAS 141-39, 2001.

83 IAS 38R-88, 2004.

84 SFAS 142-11, 2001; IAS 38R-97, 2004.

85 SFAS 142-16, 2001; IAS 38R-107, 2004.

86 SFAS 142-17, 2001; IAS 36R-10, 2004.

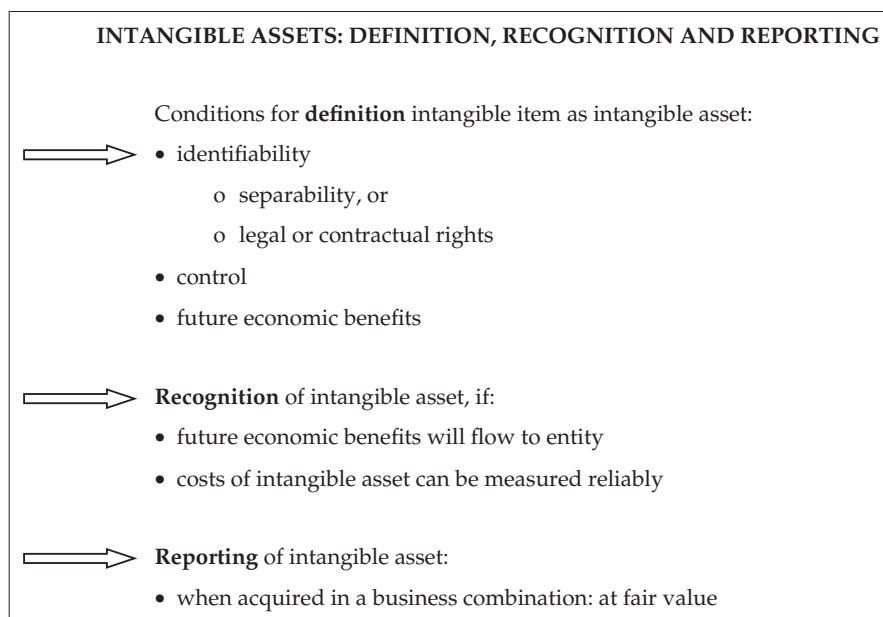


Figure 2-IV: Definition, recognition and reporting on intangible assets

2.4.3.2 Motives

An important reason for tightening the standards concerning intangible assets is the notion of company boards and other users of financial statements that intangible assets are becoming an increasingly important economic resource for many firms and make up a larger proportion of the assets acquired in many transactions. They therefore requested the provision of more complete financial information on these intangible assets.⁸⁷

2.5 LATEST CHANGES IN US GAAP AND IFRS

Recently, accounting regulation regarding reporting on business combinations was further modified. In November 2007, FASB issued a revised SFAS 141 'Business Combinations' (SFAS 141R). Shortly afterwards, in January 2008, IASB followed with a revised IFRS 3 'Business Combinations' (IFRS 3R). The effective dates of SFAS 141R and IFRS 3R are 15 December 2008 and 1 July 2009 respectively. The issue of SFAS 141R and IFRS 3R completed a joint effort by the FASB and the IASB to improve financial reporting regarding business combinations and to promote the international convergence of accounting standards.

⁸⁷ SFAS 142, 2001, summary, 7.

The revisions also have an effect on related accounting standards. SFAS 141R amends FASB Statement No. 142, 'Goodwill and Other Intangible Assets'. Following and in accordance with IFRS 3R, both IAS 36R 'Impairment of Assets' and IAS 38R 'Intangible Assets' were amended twice: in 2008 and in 2009 successively.⁸⁸

SFAS 141R and IFRS 3R introduced some significant changes to accounting for business combinations. Although the two standards are not identical, a close alignment of principles is found. This section briefly describes the most important changes in these standards when compared to 'old' SFAS 141 and IFRS 3.⁸⁹

In the revised standards it is required that all assets acquired and liabilities assumed are recognized at fair value at acquisition date, whether payment is probable or not. It only needs to be more likely than not that they meet the definition of an asset or a liability.

This new accounting rule also affects reporting on purchased intangible assets. Under the newest regulation, these assets must always be recognized and measured. There is no longer a 'reliable measurement' exception.

Further, acquisition costs (transaction costs) and restructuring costs are to be recognized separately from the acquisition, and are no longer allocated to the assets acquired and the liabilities. Now all these costs that are associated with the acquisition must be expensed. They are not included in the business combination accounting.

Moreover, the changes include that in case of a step acquisition, where the acquiring company achieves the target company in stages, previously held interests in the acquiree (target company) are re-measured on the business combination to fair value, with a gain or loss recognized in the income statement. So, all identifiable assets and liabilities are to be recognized at the full amounts of their fair values.

On the other hand, some differences between SFAS 141R and IFRS 3R can be noted. One significant difference relates to the measurement requirements for a non-controlling interest in a target company. SFAS 141R requires an acquirer to measure a non-controlling interest at its acquisition-date fair value, whereas IFRS 3R provides the acquirer with a choice for each business combination to measure a non-controlling interest either at its fair value or on the basis of its proportionate interest in the identifiable net assets of the acquiree.

88 The 2008 and 2009 revisions of IAS 36R became effective as of 1 January 2009 and 1 January 2010 respectively. The 2008 and 2009 revisions of IAS 38R came into force as of 1 January 2009, and 1 July 2009, respectively.

89 No attention is paid to the 2008 and 2009 changes of IAS 36R and IAS 38R, as these changes move in line with IFRS 3R.

Another difference relates to the way in which contingent liabilities assumed in a business combination are reported. Under IFRS 3R, a contingent liability is recognized at the acquisition date if its fair value can be reliably measured. In contrast, there are two accounting models for contingencies assumed in a business combination under SFAS 141R: one model for contractual contingencies,⁹⁰ and a second model for non-contractual contingencies.⁹¹ Contractual contingencies are measured at their acquisition-date fair values. Non-contractual contingencies are measured at their acquisition-date fair values only if it is more likely than not that they meet the definition of a liability as of the acquisition date. The requirements for recognizing these contingent liabilities differ between the two standards, partly because IASB decided to carry forward IFRS 3R's requirements for those liabilities, pending completion of its project to revise IAS 37 'Provisions, Contingent Liabilities and Contingent Assets.'

Both accounting standards boards had specific objectives when preparing the revised standards. FASB states that SFAS 141R improves the way in which an acquirer's obligations to make payments conditioned on the outcome of future events are recognized and measured, which in turn improves the measure of goodwill. According to IASB, the objective of IFRS 3R is to improve the relevance, reliability and comparability of information provided on business combinations.⁹²

The changes in the accounting standards indicate that the trend as described in section 2.4 is continued. The revised regulation requiring:

- separate recognition and measurement of intangible assets whereby the reliable measurement exception is left out;
- that all assets acquired and liabilities assumed are recognized at fair value at acquisition date, whether payment is probable or not;
- re-measurement of previously held interest in the acquiree to fair value;
- that an acquirer measures a non-controlling interest at its acquisition-date fair value,⁹³ and
- reporting on contingent liabilities assumed in a business combination,⁹⁴

implies that fair value accounting seems to have become increasingly important and that the prudence principle is less emphasized. As a result, financial statements may be containing more and more market-value-based, future-oriented components. Omitting the reliable measurement exception in the case of intangible assets will lead to more extended separate recognition

90 Such as warranties.

91 Such as litigation.

92 IFRS 3R, 2008, paragraph 1.

93 As adopted by SFAS 141R, 2007.

94 As adopted by SFAS 141R, 2007.

and measurement of intangible assets. These changes may further improve the measure of goodwill.

SFAS 141R and IFRS 3R are beyond the scope of this research. However, the changes resulting from these revised standards indicate that the trend of future-oriented fair value accounting and separate recognition and measurement of intangible assets is continued.

2.6 IMPLICATIONS FOR THE CONTENTS OF REPORTED GOODWILL: HYPOTHESES 1 TO 4

In this section, the implications of the new regulation affecting reporting on purchased goodwill will be discussed. It is argued that the accounting concept of goodwill approaches its economic concept and more closely represents the expected value creation. Following on from this, some hypotheses will be formulated. These hypotheses address the first research question of this dissertation.

2.6.1 Implications of new regulation for the contents of reported goodwill

When the new IFRS and SFAS are applied well, more information on purchased goodwill will become available and the accounting concept of goodwill should move to its economic concept. Then, goodwill is no longer viewed as a 'wasting asset', but rather as an asset with an indefinite life. Now all business combinations must be reported in the same way, namely through the purchase method. Moreover, the acquiring company must provide information regarding the reasons for the acquisition and must allocate the purchase price to the assets and liabilities of the target at their fair value. Purchased goodwill then should represent the purchase price of the acquired firm minus the fair value of its net assets. As a consequence, the *write-up* component of goodwill as mentioned in section 2.2.1 should expire.⁹⁵ Besides, the more strict regulation regarding the separate reporting on purchased identifiable intangible assets, as explained by a number of examples, will further reduce the amounts of purchased goodwill. These intangibles will no longer be accounted for as part of goodwill. In addition, the impairment test should lead to a comparison of the carrying amount of

⁹⁵ Under the old regime of the purchase method companies were also required to report the acquired assets and liabilities at their fair value. However, the introduction of the annual impairment test, the elimination of amortization of goodwill, and the obligatory more extensive allocation of the purchase price to the assets and liabilities acquired give new rise to the 'fair value' approach.

goodwill with its fair value (or recoverable amount), based on the present value of the future cash flows arising from the acquisition. Goodwill will be impaired whenever it turns out that there is a deviation between these two values. Therefore, in the event that it appears in retrospect that *residual goodwill*⁹⁶ has been involved in the acquisition (indicating that the acquisition was overpaid, or that the acquiring company overestimated the additional future profits arising from the acquisition), an impairment of goodwill should be carried out, thereby taking into account the expected future additional profits arising from the acquisition. Through these changes, purchased goodwill as entered on the balance sheet of the acquiring company should at least theoretically have become a more accurate indicator of the extra value of the acquired firm above the fair value of all of its net assets. The accounting concept of goodwill then approaches its economic concept and more closely represents the expected value creation, as it appears from the present value of the additional profits that the acquiring company is expecting to gain in the future resulting from the acquisition. Moreover, when the new rules are put into practice well, an impairment of goodwill should show a downward adjustment of the expected value of the acquired firm.

Figure 2-V represents how the new standards theoretically must have refined the recorded goodwill to a more accurate indicator.

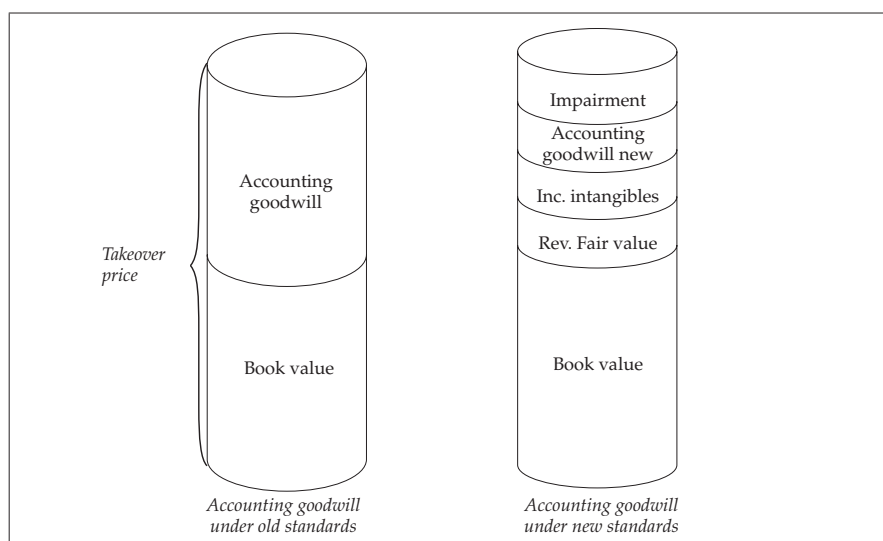


Figure 2-V: Implications of new standards on the contents of reported goodwill

⁹⁶ As discussed in section 2.2.1, the residual goodwill component represents any overvaluation of consideration and/or overpayment for the acquisition.

Figure 2-V shows that due to the new regulation, accounting goodwill should have become a smaller component of the total purchase price for the acquisition. It is less of a residual, containing other intangible items and differences in valuation. Consequently, in ideal circumstances⁹⁷, the recorded goodwill should show the *synergy* component of goodwill and the *going-concern* component of goodwill (see section 2.2.1). The FASB and IASB seemed to have had this in mind as well, when they formulated the new standards: after all, the FASB states that, by introducing the new regime, it aims for better reflection of the underlying economics of acquired goodwill and other intangible assets. SFAS 141 states that the explicit criteria for recognition of intangible assets apart from goodwill and the expanded disclosure requirements provide more information about the assets acquired and liabilities assumed in business combinations. This additional information should, among other things, provide users with a better understanding of the resources acquired and improve their ability to assess future profitability and cash flows.⁹⁸ IFRS 3 defines goodwill as “future economic benefits arising from assets that are not capable of being individually identified and separately recognized”.⁹⁹

When considering the above-mentioned changes in accounting standards, the perspective of the standard-setting bodies on the balance sheet of a company seems to have changed during recent years. Whereas in the past legal grounds seem to have been prevalent when formulating the standards concerning financial statements, resulting in assets and liabilities recorded at their historical costs and assets amortized against income during their useful lives, in recent years economic grounds seem to have gained importance: assets and liabilities are to be recorded at their fair values, based on expected future earnings and outlays; in some cases, amortization has been replaced by annual impairment tests.

2.6.2 Hypotheses 1 to 4 based on first research question

The new regulations on business combinations, intangibles, and impairment and their expected implications for reporting on goodwill lead to a number of hypotheses that address the first research question of this dissertation.

This *first research question* (see also section 1.2) is as follows:

- (I) What is the effect of the new regulation standards on the amount of purchased goodwill in relation to the total purchase price for the acquisition?

⁹⁷ i.e. all other intangible items are recorded separately and no overpayment occurs.

⁹⁸ SFAS 141, Summary, 2001, 7.

⁹⁹ IFRS 3, 2004, appendix A.

The corresponding *hypotheses*¹⁰⁰ are:

- Hypothesis 1: New regulation results in more frequent reporting on purchased goodwill.
- Hypothesis 2: New regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition.
- Hypothesis 3: New regulation leads to more frequent reporting on separately acquired intangibles.
- Hypothesis 4: Reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill.

Hypothesis 1 is considered in chapter 4 on data, as in this chapter the final sample will be composed on the basis of reported purchased goodwill. Hypotheses 2, 3 and 4 are tested in chapter 5, where purchased goodwill under the *old* regime is compared to purchased goodwill under the *new* regime.

2.7 STATE OF THE ART OF RESEARCH INTO GOODWILL

Table 2-3 (at the end of this chapter) provides information on the state of the art of research into goodwill. In this section, the state of the art research into goodwill is classified into four groups: research using the balance sheet model, research using the income statement model, research into goodwill impairment, and other research. The outcomes of the studies are discussed below, classified into these four groups. This section closes with some conclusions on the state of the art of the research.

Balance sheet model and income statement model

Table 2-3 shows that most studies have focused on the value relevance of goodwill and its amortization. These studies are principally based on the work of Ohlson (1995), who examined the value relevance of earnings, dividends and book value by using balance sheet models and income statement models to assess this value relevance. When applying these models to goodwill, the balance sheet model regresses market value on goodwill and non-goodwill assets and liabilities, while the income statement approach examines the contemporaneous relation between long-term stock returns and goodwill amortization and pre-goodwill amortization.

100 These hypotheses are research hypotheses (or experimental hypotheses). They display the predicted effects. The null hypotheses are their opposites. They state the situation in which there are no predicted effects (e.g. Field, 2005, 23, and Aron et al., 2008, 148-149). When doing the steps of hypotheses testing, a roundabout method will be used: in the empirical research part of this dissertation it will first be tested whether the null hypotheses can be rejected. This done, a decision can be made regarding their alternatives, the research hypotheses.

In these studies, the basic balance sheet model is broadly as follows.¹⁰¹

$$MV_{j,t} = \alpha_1 + \alpha_2 * BV_{j,t} + \alpha_3 * GW_{j,t} + \alpha_4 * LIAB_{j,t} + \varepsilon \quad (1)$$

j refers to a specific company and t to the moment in time. MV represents the market value, GW concerns the goodwill recorded on the balance sheet of the company, BV is about the book value of the assets other than goodwill, and LIAB represents the book value of the liability.

In general, the formula of the income statement model runs in the following order.¹⁰²

$$R_{j,t} = \beta_1 + \beta_2 * A_{j,t} + \beta_3 * AGW_{j,t} + \varepsilon \quad (2)$$

Here, R represents the stock returns and A is about earnings before goodwill amortization. AGW regards amortization on purchased goodwill.

Research using the balance sheet model

Different authors elaborate variants of balance sheet model. For instance, Barth and Clinch (1996) explore differences between US and other countries' GAAP by investigating whether differences between domestic and US GAAP for US-listed UK, Australian, and Canadian firms are associated with firms' returns and prices. One of their findings is that in all cases goodwill is priced as an asset. Bugeja and Gallery (2006) examine whether the value relevance of goodwill holds as it ages. They find that the firm value is positively associated with purchased goodwill in the previous year and in each of the two preceding years, but not with goodwill acquired more than two years previously. Chauvin and Hirshey (1994) distinguish among manufacturing and non-manufacturing companies. Regarding the non-manufacturing firms, their research shows a consistently positive influence of accounting goodwill numbers on both profitability and the market value of the firm. Another variant of the balance sheet model is put forward by Henning et al. (2000). They introduce a refinement of the balance sheet model by examining the value relevance of the write-up, going-concern, synergy and residual components of purchased goodwill.¹⁰³ In their research, market value is not only regressed on the book value of non-goodwill assets, the book value of liabilities, and purchased goodwill from earlier acquisitions, but also on these four components of purchased goodwill. They show that the going-concern goodwill and synergy-goodwill components are essentially assets, whereas the residual is not. Huijgen (1996) focuses his

101 e.g. Jennings et al., 1996.

102 e.g. Henning et al., 2000.

103 See section 2.2.1 for further details on these components.

balance sheet model research on Dutch companies. He examines whether investors perceive purchased goodwill as an asset contributing to the market value of the company. The outcomes of his study show a strong association between the market value of equity and goodwill, suggesting that investors do indeed consider purchased goodwill as an asset.

Jennings et al. (1996) test whether purchased goodwill as an asset subject to amortization results in accounting numbers that reflect economic resources and their consumption. They find a strong positive association between equity values and goodwill asset amounts, after controlling for other components of net assets. They show a weak negative association between equity values and goodwill amortization. Their results are consistent with the hypothesis that investors view goodwill as an economic resource that declines in value, at least for the average firm in their sample. For some firms, their results suggest that investors may view goodwill as an economic resource that does not decline in value.

McCarthy and Schneider (1995) also consider the market perception of goodwill as an asset in the determination of the firm's valuation. They find that the market tends to view goodwill as an asset when valuing a company. They further demonstrate that goodwill is valued by the market at least as much as other assets. Shahwan (2004) analyzes the Australian market perception of goodwill and identifiable intangibles in the determination of the firm's market valuation relative to other tangible assets. The outcomes show that both reported goodwill and identifiable intangibles are perceived as assets. Reported goodwill seems to have the highest weight of the market value, whereas identifiable intangible assets have the lowest weight. Further, the association between equity market values and write-offs of goodwill and identifiable intangibles is negative.

Research using the income statement model

Different variants of the income statement model are found in literature. Barth and Clinch (1996) explore differences between US and other countries' GAAP. One of their findings after performing regressions of stock returns is that goodwill is priced as an asset.

When distinguishing among manufacturing and non-manufacturing firms, Chauvin and Hirschey (1996) show that for the non-manufacturing firms accounting goodwill numbers do positively influence the profitability of firms, which is measured by net income. Henning et al. (2000) apply the income statement model, by regressing stock returns on amortization of the three goodwill components: going-concern goodwill, synergy goodwill, and residual goodwill next to earnings and amortization on purchased goodwill from earlier acquisitions. They find no significant relationship between returns and amortization of going concern and synergy components of goodwill, indicating that going-concern and synergy components are non-wasting assets, or that the assumed amortization rule does a poor job. Regarding Dutch companies, and applying the income statement model, Huijgen (1996) finds that stock returns are not better explained by reported

earnings if some amount for systematic amortization of accumulated goodwill expenses is subtracted.

All these studies using balance statement models and income statement models have in common that they apply goodwill and goodwill amortizations as characteristics explaining market value and stock returns of the acquirer, after the acquisition has taken place.

Research into goodwill impairment

In addition to these examinations, different studies regarding goodwill impairment have been carried out. Using a descriptive analysis, Eldridge (2005) estimates the average size of the different components of goodwill and argues the plausibility of an impairment of goodwill. She clarifies that impairment of the going concern goodwill component (45 percent of purchased goodwill) is not likely, impairment of synergy goodwill (19 percent of purchased goodwill) is possible, and impairment of residual goodwill (36 percent of purchased goodwill) is most likely.

Hirschey and Richardson (2002 and 2003) and Van Triest and Weimer (2004) examine the association between goodwill impairment announcements and stock returns.

In two different studies, Hirschey and Richardson (2002 and 2003) consider the information content of accounting goodwill numbers by analyzing effects of announcements of goodwill impairments on the stock prices of the companies involved. Their analysis shows negative stock price reactions preceding the announcement, an immediate adverse stock-price reaction at the announcement, and post-announcement adverse stock price reactions. From the results they conclude that accounting goodwill numbers do represent aspects that are important for asset recognition and that announced goodwill impairments seem to signal important information about a meaningful deterioration in the firms' future profit-making potential. The pre-announcement negative stock returns further show that goodwill impairments are partially anticipated. The post-announcement negative stock returns indicate investor under-reaction to goodwill impairment announcements. Van Triest and Weimer (2004) observe impairment announcements of Dutch companies. In line with the results of Hirschey and Richardson (2002 and 2003), they find that the company's stock returns surrounding the impairment announcement period are significantly negative. Their results further show that lower goodwill amounts are to a certain extent anticipated by the investors.

Another approach is followed by Hayn and Hughes (2006), who examine whether financial disclosures of acquired entities help investors to effectively predict goodwill impairment. Based on the results of regression analyses of goodwill impairments, they conclude that the characteristics of the original acquisitions are more powerful predictors of potential goodwill impairments than those based on disclosures of the post-acquisition performance of the operating segments to which the acquired company's assets are allocated.

They further conclude that goodwill impairments lag behind the economic impairment of goodwill (as shown by the deterioration of the performance of the acquired company) by three to four years.

Other research

Two studies follow other approaches that cannot be categorized under studies using the balance sheet model – studies using the income statement model and studies of goodwill impairment. Mueller and Supina (2002) analyze the development of the concept of goodwill capital and estimate its likely magnitudes. They find that goodwill, defined as the difference between the market value of the company, capital arising from research and development, capital arising from advertising, and PPE (Property, Plant and Equipment), turns out to be the largest of these four components for many companies. However, they also conclude that based on this analysis, roughly half of the estimates of goodwill capital turn out to be negative.

Vincent (1997) examines whether the choice of the purchase or pooling method of accounting for a business combination affects firm valuation, and whether the investors make appropriate accounting adjustments to value purchase and pooling firms on an equivalent basis. On the basis of the results of regression analyses and descriptive analyses, she observes that firms that choose the pooling-of-interests method enjoy a firm valuation premium in comparison to firms that choose the purchase accounting method. She further shows that investors adjust accounting numbers for pooling and purchase firms, so that the valuation differences cannot be explained by the accounting method used. She concludes that investors appear to value pooling firms more highly, on average, than purchase firms in the years immediately following the business combination for reasons other than accounting.

Conclusions

The state of the art of the research shows that in almost all regression analyses discussed, goodwill is used as an explanatory (independent) variable, i.e. goodwill is used to explain market value or goodwill impairment is employed to explain stock returns. Goodwill and goodwill impairments then are related to the market value or returns of the acquiring company.

When goodwill or goodwill impairments are not applied as variables to explain market value or stock returns, mostly descriptive analyses are performed on these variables.

There are few studies known in which goodwill or goodwill impairment is included as a dependent variable. The only research known thus far is the study of Hayn and Hughes (2006) who perform regression analyses to explain goodwill impairments.

From the above, it follows that when compared to other studies of goodwill this dissertation is innovative in the following respects. It focuses on purchased goodwill in acquisitions instead of on the reported asset goodwill in the financial statements of a company created in the course of time (as some of the other studies do). It relates purchased goodwill to the value of transaction of the acquisition instead of to the market value of the acquiring company. Finally, it examines whether this purchased goodwill resembles the expected value creation by these acquisitions. So in this research purchased goodwill is used as a variable to explain (dependent variable) instead of as an explanatory variable (independent variable).

2.8 SUMMARY

Regarding regulations for accounting and reporting on purchased goodwill, three important changes have taken place.

First, US GAAP (2001) as well as IFRS (2004)¹⁰⁴ now require that all mergers and acquisitions are reported using the *purchase method*. The pooling of interests method, in which the balance sheet of the new combination represents the sum of the previous book values of the assets and liabilities of the separate companies and no goodwill is reported, is no longer permitted. The purchase method requires that one of the companies is assigned as the acquiring company. The acquiring company must provide information about the reasons for the acquisition and must allocate the purchase price to the assets and liabilities of the target at their fair values. Purchased goodwill then should represent the purchase price of the acquired firm minus the fair value of its net assets.

A second change regarding accounting and reporting on purchased goodwill is that amortization of goodwill is no longer permitted. It is replaced by an annual impairment test.¹⁰⁵ Goodwill is no longer viewed as a 'wasting asset', but rather as an asset with an indefinite life. Only when it turns out that the carrying amount of goodwill exceeds its fair value will goodwill be impaired to the lower fair value.

A third change is that the rules regarding separate identification of purchased intangible assets are further accentuated and are more unambiguous.¹⁰⁶

104 SFAS 141, 2001; IFRS 3, 2004.

105 SFAS 142, 2001; IAS 38R, 2004.

106 SFAS 142, 2001; IAS 36R, 2004.

As a result of these changes, the information content of purchased goodwill may have increased. Goodwill may have become a more concise term that contains relevant information about expected value creation or synergy of the acquisition. Accounting goodwill, representing the difference in valuation between purchase price and reported value on the acquired net assets, then moves to its economic concept, in which goodwill is regarded as the present value of the additional profits.

The aim of this dissertation is to further examine the information content of goodwill. The new regulations on business combinations, intangibles, and impairment and their expected implications for reporting on goodwill lead to a number of hypotheses which address the *first research question* of this dissertation.

It is hypothesized that new regulation affecting reporting on purchased goodwill results in more frequent reporting on purchased goodwill (hypothesis 1), and in a more concise term for expressing goodwill, thus comprising a lower component of the purchase price for the acquisition (hypothesis 2).

Further, it is postulated that new regulation leads to more frequent reporting on separately acquired intangibles (hypothesis 3), and that reporting on these separately acquired intangibles, as required by new regulation, reduces purchased goodwill (hypothesis 4). Hypothesis 1 will be tested in chapter 4. Hypotheses 2 to 4 will be examined in chapter 5.

The state of the art of the research on goodwill shows that in almost all regression analyses discussed, goodwill is used as an explanatory variable, i.e. goodwill is used to explain market value or goodwill impairment is employed to explain stock returns. There are few studies known in which goodwill or goodwill impairment is included as a dependent variable. This dissertation will be innovative in that it relates purchased goodwill to the value of transaction of the acquisition instead of to the market value of the acquiring company and in that it will examine whether this purchased goodwill resembles the expected value creation by these acquisitions. So purchased goodwill is now used as a variable to explain instead of as an explanatory variable.

Table 2-3: State of the art of research into goodwill

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Barth and Clinch (1996)	Sample of firms that (1) were incorporated in the United Kingdom (UK), Australia, and Canada; (2) traded equity shares in US securities markets, and (3) presented in their annual reports a reconciliation from domestic to US GAAP: 55 UK firms, 16 Australian firms, and 242 US firms. Time period 1985-1991	Exploration of differences between US and other countries' GAAP by investigating whether differences between domestic and US GAAP for US-listed UK, Australian, and Canadian firms are associated with firms' returns and prices. The investigated accounting differences include goodwill, asset revaluations, income taxes, pensions, interest capitalization, foreign currency, and extractive industries accounting	Method: Regression analysis Dependent variables: (1) 15 months US and domestic stock returns, ending three months after fiscal year-end (2) price per share three months beyond fiscal year-end Explanatory variables: (1) net income (domestic GAAP/US GAAP, and difference), extractive industries (2) shareholders' equity (domestic GAAP, US GAAP, and difference) (1) and (2) goodwill and other intangibles, asset revaluation, pensions, interest capitalization, foreign currency translation, and other	Goodwill is priced as an asset; asset revaluations, successful efforts accounting for extractive industries, and immediate recognition of foreign currency exchange gains and losses on long-term assets and liabilities are uncorrelated with the information that investors consider relevant; UK, US, and Australian tax accounting methods do not recognize enough tax expense or liability; accrual pension accounting and, in some specifications, interest capitalization add explanatory power beyond Australia's cash-based approach; SEC's required GAAP reconciliation reflects information useful to investors for UK and Australian firms, and to a more limited extent, for Canadian firms
Bugeja and Gallery (2006)	Sample of 136 observations and 475 firm years of US publicly quoted acquirers. Time period 1995-2001	Examination whether the value relevance of goodwill holds as it ages	Method: Regression analyses Dependent variables: Acquirer's market value common stock Explanatory variables: Book value equity, goodwill, identifiable intangibles, net income	Firm value is positively associated with purchased goodwill in the previous year and in each of the two preceding years, but not with goodwill acquired more than two years previously. Only recently acquired goodwill is associated with the market value of equity, which indicates that the market perceives older goodwill as not having future benefits. The results suggest that recently acquired goodwill has information content whereas older goodwill does not

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Chauvin and Hirshey (1994)	Sample of 2,693 publicly quoted US companies with all required information available on Compustat. Time period 1989-1991	Examination whether accounting goodwill numbers are a useful proxy for the size and duration of economic goodwill. Focus on whether or not accounting goodwill numbers provide investors with useful information regarding the important intangible asset dimension of the value of the firm	Method: Regression analysis Regressions with (a) manufacturing companies, (b) non-manufacturing companies, and (c) full sample Dependent variables: (1) goodwill (2) net income (3) market value Explanatory variables: (1), (2), and (3): advertising expenditures, R&D expenditures market share, intangible assets, tangible assets (2) goodwill, leverage, growth in sales (3) goodwill, net income, growth in sales, beta	The study identifies a number of firm-specific characteristics with a consistent influence on goodwill (coefficient of advertising expenditures positive, coefficient of R&D expenditures negative for (a), insignificant for (b) and positive for (c), coefficient of intangible assets positive for (a), coefficient of tangible assets positive for (a), (b), and (c)). Regarding the non-manufacturing firms, the study further shows a consistently positive influence of accounting goodwill numbers on both profitability and the market value of the firm
Eldridge (2005)	Sample of 51 acquisitions between publicly quoted US banks. Time period 1993-1998	Examination of vulnerability of goodwill and intangibles to impairment losses by linking it to the initial valuation of those assets that occurs at acquisition when the purchase accounting method is used	Method: Descriptive analysis Estimates of three components of goodwill: going concern value, value of acquisition synergies, and residual value Estimate of non-goodwill purchase price adjustments	The mean going-concern value is about 45 percent of the mean acquisition goodwill. As long as post-merger integration and changes in operations of the target do not weaken the target entity's stand-alone value, impairment of this goodwill component is not likely. The mean synergies value adds to approximately 19 percent of the mean acquisition goodwill. If the goodwill attributed to synergies is assigned to the wrong reporting unit or if synergy benefits do not materialize as expected, the likelihood of goodwill impairment losses increases.

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Hayn and Hughes (2006)	Sample of 2,852 acquisitions between US publicly quoted companies. Time period 1988-1998	Examination whether financial disclosures of acquired entities allow investors to effectively predict goodwill impairment	Method: Regression analysis Dependent variable: goodwill write off Explanatory variables: acquisition characteristics, premium, number of bidders, relative goodwill, percentage of stock, acquirer stock excess returns, acquisition activity Performance indicators: Return on assets, change in return on assets, operating losses, change in sales	<p>The remaining 36 percent of mean acquisition goodwill (residual) is considered to represent either misvaluation of the acquisition consideration or overpayment. Unless the reporting unit to which this goodwill is assigned can quickly create new going-concern value or has existing unrecognized going-concern value to offset this residual component of goodwill, impairment losses are likely</p> <p>The characteristics of the original acquisitions are more powerful predictors of potential goodwill write-offs than those based on the segment disclosures of the acquired entities performance. Further, goodwill write-offs lag behind the economic impairment of goodwill by three to four years</p>

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Henning et al. (2000)	Sample of 1,576 US acquisitions between publicly quoted companies. Time period 1990-1994	Examination whether investors distinguish among identifiable components of goodwill for valuation purposes	Method: Regression analyses Dependent variables: (1) acquirer's market value common stock (2) acquirer's stock returns Explanatory variables: (1) book value non-goodwill assets, book value liabilities, purchased goodwill from earlier acquisitions, write-up, going-concern, synergy, and residual components of purchased goodwill (2) earnings, amortization on goodwill from earlier acquisitions, and amortization on going concern, synergy, and residual goodwill	Results provide evidence that the core goodwill component (going concern goodwill and synergy goodwill) is essentially an asset whereas the residual component (overvaluation/overpayment goodwill) is not. A insignificant relationship between returns and amortization of going concern and synergy components of goodwill indicate that going concern and synergy components are non-wasting assets, or the assumed amortization rule does a poor job
Hirschey and Richardson (2002)	Sample of 80 U.S.-listed companies that made discretionary announcements of goodwill write-offs. Time period 1992-1996	Consideration of the information content of accounting goodwill numbers: analysis of market-value effects of goodwill write-off decisions	Method: Data analysis (1) Market-model, mean-adjusted, and market-adjusted cumulative stock excess returns and t-statistics are shown for the (-1, 0) event-period window by (a) type of goodwill write-off announcements and (b) by industry group. (2) Market-adjusted cumulative average stock excess returns and t-statistics are shown for the year preceding (-250, -10), the announcement period (-1, 0), and the year following (10, 250) the goodwill write-off announcements by (a) type of goodwill write-off announcements and (b) by industry group	The analysis shows a negative stock price reaction of 41.77 percent in the one-year preannouncement period, a 3-3.5 percent immediate adverse stock-price reaction and an 11 percent one-year post-announcement adverse stock price reaction to goodwill write-off announcements. These negative stock-price effects indicate that goodwill data capture a significant aspect of the intangible dimension of firm value: accounting goodwill numbers do embody aspects necessary for asset recognition on the financial statements of business enterprises. Goodwill write-off announcements seem to signal important information about a meaningful deterioration in the firms' future profit-making potential

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Hirschey and Richardson (2003)	Sample of 80 U.S.-listed companies that made discretionary announcements of goodwill write-offs. Time period 1992-1996	Consideration of the information content of accounting goodwill numbers: Examination of the reaction of investors to goodwill write-off decisions. Extension to Hirschey and Richardson (2002) by focusing on stock price behavior during pre- and post-announcement periods spanning long windows	<p>Methods:</p> <p>A. Data analysis</p> <p>(1) Market-model, mean-adjusted, and market-adjusted cumulative average stock excess returns and t-statistics are shown for the (-1, 0) event-period window by (a) type of goodwill write-off announcements and (b) by industry group.</p> <p>(2) Market-adjusted cumulative average stock excess returns and t-statistics are shown for the year preceding (-250, -10), the announcement period (-1, 0), and the year following (10, 250) the goodwill write-off announcements by (a) type of goodwill write-off announcements and (b) by industry group</p> <p>B. Regression analysis</p> <p>Dependent variable: Long-window stock excess returns</p> <p>Explanatory variables: Event date stock excess returns Intangibles/market capitalization Market capitalization</p>	Similar to Hirschey and Richardson (2002), the analysis shows a negative stock price reaction of 41.77 percent in the one-year pre-announcement period, a 3-3.5 percent immediate adverse stock-price reaction and an 11 percent one-year post-announcement adverse stock price reaction to goodwill write-off announcements. Further, it is found that large immediate negative stock-price reactions to goodwill write-off announcements were associated with somewhat larger negative one-year post-announcement period effects. Negative valuation effects during the announcement period suggest that a goodwill write-off conveys economically meaningful information to investors about a reduction in the company's future profit-making ability. Negative valuation effects during the pre-announcement period indicate that investors partially anticipate goodwill write-offs. Negative valuation effects during the post-announcement period suggest investor under-reaction to goodwill write-off announcements

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Huijgen (1996)	Sample of 91 Dutch companies, listed on the Amsterdam Stock Exchange at any point in time in the period from May 31, 1990 to May 1994	(1) Examination of whether investors perceive purchased goodwill as an asset contributing to the market value of the company. (2) Study of perception of investors with respect to the question of amortization of purchased goodwill (3) Investigation of whether the valuation of expenses for purchased goodwill, because of the suggested uncertainty of future benefits, does differ from other components of equity book value	Method: Regression analyses Dependent variables: (1) market value of equity (2) stock returns (3) share beta Explanatory variables: (1) equity book value, book value of accumulated goodwill expenses, earnings, dividends (2) earnings, amortization of accumulated goodwill, dividends (3) two different leverage ratios: book value of equity divided by book value of debt, and book value of accumulated goodwill expenses divided by book value of debt	1) Strong association between market value of equity and book value of equity, goodwill, and earnings. Outcomes suggest that investors perceive goodwill as an asset with a rather long economic life (2) Explanatory value of reported earnings does not increase if some amount for systematic amortization of accumulated goodwill expenses is subtracted (3) in first instance, on average only one percent of the variation in share beta is explained by both financial leverage ratios. Clear improvements in the results are reported after deleting less traded shares
Jennings et al. (1996)	Sample of 259 US acquisitions between publicly quoted companies. Time period 1982-1988	Does recording purchased goodwill as an asset subject to amortization result in accounting numbers that reflect economic resources and their consumption?	Method: regression analyses Dependent variables: Acquirer's market value common stock (1, 2 and 3) Explanatory variables (1): Book value of purchased goodwill, PPE, other assets, liabilities	Strong positive association between equity values and goodwill asset amounts, after controlling for other components of net assets. Weak negative association between equity values and goodwill amortization, after controlling for other components of expected earnings. Results are consistent with the hypothesis that investors view goodwill as an economic resource that declines in value, at least for the average firm in the sample

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
McCarthy and Schneider (1995)	Sample of firms incorporated in the US and reporting goodwill in the five year period 1988-1992: 1,106, 1,172, 1,227, 1,260, and 1,451 observations respectively	Consideration of the market perception of goodwill as an asset in the determination of the firm's valuation. Exploration whether the market values goodwill to the same degree as it values other assets	Explanatory variables (2): Expected future earnings, goodwill amortizations, depreciation expenses, and growth Explanatory variables (3): Same as (2) but now including goodwill and PPE	The results also suggest that investors may view goodwill as an economic resource that does not decline in value for some firms. This conclusion suggests that the capitalization and annual review alternative under consideration has the potential to best represent resources and the performance of the firm
Mueller and Supina (2002)	Sample of 53 US publicly quoted companies. Time period 1973-1984	Development of the concept of goodwill capital and estimation of its likely magnitudes	Method: Regression analysis Dependent variable: Market value of common stock Explanatory variables: Book value of goodwill Book value of assets less goodwill Book value of liabilities Net income Method: Data analysis Data analysis of goodwill, defined as the difference between market value, R&D, advertising, and PPE	The first finding is that the market tends to view goodwill as an asset when valuing a company. The second finding is that goodwill is valued by the market at least as much as other assets For many companies, goodwill capital turns out to be the largest of the four components. Roughly half of the estimates of goodwill capital turns out to be negative

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Shahwan (2004)	Sample of Australian publicly quoted companies, 223 (1997), 237 (1998), 249 (1999), 284 (2000), Time period 1997-2000	Analysis of the Australian market perception of goodwill and identifiable intangibles in the determination of firm's market valuation. Exploration of the market perception of the assets goodwill and identifiable intangibles relative to other tangible assets	Method: Regression analysis Dependent variable: Market value of shareholders' equity Explanatory variables: 1. Book value of assets excluding intangibles, book value of liabilities, book value of goodwill, book value of identifiable intangibles 2. Book value of assets, book value of liabilities, market value of liabilities operating profit after tax before goodwill and identifiable intangibles, amortization, goodwill amortization expense, identifiable intangible amortization expense	The results show a strong positive association between reported goodwill and identifiable intangible asset values and equity market values: the market appears to perceive reported goodwill and identifiable intangibles as assets in the determination of firms' market valuation. The highest coefficient values among the variables of the model of the study (the asset-based model) belong to reported asset goodwill and to a lesser extent, other net assets. On average, the market perceives reported goodwill as having a higher weight than other financial position statement items in the asset-based model, whereas the market appears to discount reported identifiable intangible assets relative to other items in the model when valuing firms. Further, evidence suggests that there is a negative and inconsistently significant association between equity market values and write-offs of goodwill and identifiable intangibles, concluding that such associations may vary substantially across firms; thus, the use of standardized amortization requirement may be appropriate
Van Triest and Weimer (2004)	Sample of 17 publicly quoted Dutch companies, announcing impairments between July 2001 and July 2003	Examination of the informative value of a goodwill impairment to the stock market	Method: data analysis	Stock returns surrounding the announcement period are significantly negative. However, the change of market value is less than the impairment loss, indicating that stock prices anticipate a lower goodwill amount

Authors	Sample	Focus of the study	Method and variables	Outcome of the study
Vincent (1997)	Sample of 92 purchase transactions (57 and 35 pooling transactions) Time period acquisitions 1979-1996. Data gathering for the combination for the year before and up to five years following the business combination. Time period 1978-1991	Examination of whether the choice of the purchase or pooling method of accounting for a business combination affects firm valuation. Examination of whether the investors make appropriate accounting adjustments to value purchase and pooling firms on an equivalent basis	Method: A. Regression analysis Dependent variable: Price per share Explanatory variables: Book value of equity Net income Accounting acquisition premium net of accumulated amortization per share times dummy for pooling method Accounting acquisition premium net of accumulated amortization per share times dummy for purchase method Accounting acquisition premium amortization expense times dummy for pooling method Accounting acquisition premium amortization expense times dummy for purchase method B. Data analysis Analysis of market to book and price to earning ratios of the pooling and purchase firms relative to each other and relative to the industry median on both an 'as reported' basis and an 'as adjusted' basis	The results overall suggest that concerns about the negative valuation implications of purchase accounting are not unjustified. Firms that choose (or that structure transactions to achieve) the pooling-of-interests method of accounting for a business combination appear to enjoy a valuation premium relative to purchase firms and relative to their industry, especially as measured using P/E ratios. This premium is largest in the year of the acquisition and, although declining, it remains significant for two to three years following the acquisition. The evidence also suggests investors adjust accounting numbers for pooling and purchase firms to an approximately equivalent basis so the accounting method, in and of itself, does not explain the valuation differences



3 Goodwill explained by acquisition theories

3.1 INTRODUCTION

This chapter focuses on acquisition theories that may attribute to explaining goodwill. Prior literature gives three different theories that seem to be relevant for this research: the efficiency theory, the empire-building theory, and the hubris theory.

The *efficiency theory* claims that merger bids are initiated by managers attempting to create value. The new combination will be more productive than the sum of its parts, due to synergy gains and to improved managerial effectiveness of the target company. Goodwill may represent this expected synergy, as acquiring companies are prepared to pay for the expected value creation¹⁰⁷ caused by it.

The *empire-building theory* and the *hubris theory* are both behavioral theories using psychology-based arguments to explain that merger bids can also be initiated by managers with motives other than synergistic ones, resulting in overpayment for the acquisition. The *empire-building theory* states that acquisitions are planned and executed by the managers of the buyer's company, in order to maximize their own utility instead of shareholder value. The *hubris theory*, as introduced by Roll (1986), argues that overconfident Chief Executive Officers (CEOs) systematically overestimate the full economic value of the combined company. Due to empire-building or to hubris, acquiring companies are prepared to overpay for the acquisition, and purchased goodwill may represent this overpayment.

Other determinants that may influence the amount of purchased goodwill consider the bargaining position of the parties and the misvaluation of acquirer or target by the stock market.

This chapter is organized as follows. In section 3.2, the three relevant acquisition theories and the other determinants will be examined as well as their relevance while explaining purchased goodwill. Section 3.3 summarizes results of earlier research into these theories. Section 3.4 discusses the state of the art of research explaining target returns and bid premiums. Based on these theories, and the outcomes of earlier research, section 3.5 comes up with a selection of characteristics that seem to be relevant while investigating the

107 Expected value creation due to synergy is calculated by discounting expected future incremental cash flows corresponding to these synergy benefits, thereby taking into account uncertainty.

value relevance of goodwill, especially regarding the effects on target returns and bid premiums, as it will be shown that goodwill moves in line with them. This selection is derived while discussing the part of the research into the hypotheses of the theories about target returns and bid premiums in more detail. This chapter ends up with a summary and conclusion in section 3.6.

3.2 THEORIES ON ACQUISITIONS

In this section, three different theories that may help to explain goodwill will be discussed: the efficiency theory, the empire-building theory, and the hubris theory. Further, other determinants that may influence goodwill will be reviewed. These determinants regard the bargaining position of the parties and misvaluation of acquirer or target by the stock market.

3.2.1 The efficiency theory

According to the efficiency theory that arises from the neoclassical economic theory, acquisitions are made in order to obtain synergies that find expression in cost reductions and better performance and thereby create extra value to the combined company. Three forms of synergies that are to be distinguished, and that will be discussed below, are operating synergies, financial synergies and tax savings.¹⁰⁸ This section concludes with a consideration of the impact of the efficiency theory on purchased goodwill.

3.2.1.1 *Operating synergies*

Operating synergies are derived by combining activities, skills and knowledge or advantageously applying them from one company to another. They arise from economies of scale, economies of scope, technical and managerial skill transfers or asset restructuring.

Economies of scale result from decreases in per unit costs due to an increase in scale of the operations of the combined company. Examples are large-scale production, uniting marketing, distribution, and research and development activities, and increased specialisation of labour and management, which might not be possible at lower production scales.

Economies of scope arise when the combined company offers a greater variety of products and services after the acquisition, whereas it uses the same or less marketing, distribution and R&D activities than the stand-alone companies used before.

¹⁰⁸ In explaining the efficiency theory, this chapter has gratefully made use of the extensive discussions in Rappaport (1998) and Gaughan (1991).

Technical and management skills transfers from one company can be profitably exploited in the business of the other company in the acquisition. Regarding the applications of management skills, the improved management hypothesis can be mentioned.¹⁰⁹ The acquirer company's management skills are such that the value of the target would rise under its control. In this context, the market for corporate control should be mentioned. This market is referred to as a way to replace poor management of a target company. Jensen and Ruback (1983) describe the market for corporate control as "an arena in which managerial teams compete for the rights to manage corporate resources".¹¹⁰ When a company does not perform well due to poor management, the price of the shares of that company will decrease. It then becomes attractive for well-performing managers of another firm to acquire that company and to replace its poor managers.

In the case of *asset restructuring*, assets of the target company are shifted to their highest valued use after the acquisition. If the break-up value of the sum of the parts of the target company is worth more than its 'going-concern' market value as reflected in the company's stock price, an acquiring company can create value for its shareholders by liquidating parts of the target company. The theory of corporate diversification needs to be mentioned here. This theory, evolved by Penrose (1959), rests on the assumption that the large business enterprise can be regarded as a coalition of heterogeneous, 'lumpy' assets subject to administrative coordination. Some of these assets have multiple uses and can be better deployed in several activities rather than be used at full capacity to produce one output that may face a downward-sloping demand. Under those circumstances it may be worth it to acquire another company.

Operating synergies are most likely to turn up in situations where businesses operate in closely related product markets: horizontal mergers, vertical mergers, or, in view of the argument of economies of scope, concentric acquisitions.

3.2.1.2 *Financial synergies*

Financial synergies stem from lower costs of capital for the acquiring company or for the combined company resulting from the acquisition.

These costs of capital may be reduced due to the increase in size: now that acquirer and target are combined, the issuing costs and transaction costs of

109 Gaughan, 1991, 147.

110 Jensen and Ruback (1983, 6) remark that "viewing the market for corporate control as the arena in which management teams compete is a subtle but substantial shift from the traditional view, in which financiers and activist stockholders are the parties who buy control of a company and hire and fire management to achieve better resource utilization. The managerial competition model views competing management teams as the primary activist entities, with stockholders playing a relatively passive, but fundamentally important, judicial role."

new capital will relatively decrease and access to financial markets will be eased.

The lower cost of capital will also arise because in most cases the expected free cash flows of the acquiring company and the target company will be imperfectly correlated. The formerly separate organisations now actually guarantee each other's debt, which is called debt-coinsurance and will result in a reduction in the risk of financial distress. This risk reduction enables the combined company to borrow debt at lower interest rates or can be used to issue more debt, resulting in better financing opportunities. A diversifying acquisition may further lower the systematic risk of the company's investment portfolio, resulting in a lower required rate of return on equity, and an increase in value of the combined company.

An acquisition may also improve the use of debt capacity and financial slack. The target company may have unused debt capacity that can be applied to lower its average costs of capital by introducing more leverage in its capital structuring, or it may be the case that financial slack of either acquirer or target can be absorbed by the new combination.

3.2.1.3 *Tax savings*

An acquisition may also be value-creating if it opens channels for tax savings. There may be benefits from net operating loss carryovers from the target company and from allowed additional depreciation when the basis of acquired assets has been stepped up. Although tax savings could create value for the combined company, they may create little value for the acquiring company, as the acquiring company may have no distinctive ability to exploit the synergies compared to other potential acquiring companies. In that case, one would expect the prices to be bid up in the competitive market for corporate control to a level where acquiring companies can expect to earn only a normal rate of return.

3.2.1.4 *The efficiency theory and purchased goodwill*

When the efficiency theory applies, the value-creating acquisition will result in positive target returns, as a bid premium needs to be paid to take over, and, depending on the bargaining position of the buyer and seller,¹¹¹ in acquirer returns that will be positive or otherwise zero. Purchased goodwill then will represent a part or all of the value creation arising from the synergies, and will increase with value creation.

111 The maximum price the acquirer is prepared to pay for the acquisition is the stand-alone value of the target before the acquisition plus the expected value creation to the combination. At this price, acquirer's shareholders will break even. Depending on the bargaining position of acquirer and target, the actual acquisition price can be lower than this maximum price, leaving bidder's shareholders with a positive return.

3.2.2 The empire-building theory

Lines of thought which assume that acquisitions occur to benefit the bidder's managers, can be classified under the collective empire-building theory. The empire-building theory is a behavioral theory using psychology-based rather than economic arguments to explain acquisitions. In this section the empire-building theory, as well as several lines of thought that come under the empire-building theory, are discussed: diversification, buying growth, management entrenchment, investing free cash flow, and preferring to be the bidder instead of the target. Furthermore, the effect of acquirer's managements' empire-building on purchased goodwill will be considered.

3.2.2.1 *The empire-building theory explained*

The empire-building theory states that acquisitions are planned and executed by the managers of the buyer's company in order to maximize their own utility instead of the shareholder value. Put in another way, according to the empire-building theory managers aim for maximization of their own goals, subject to constraints put upon them by the capital market (Trautwein, 1990). This may appear in the event that there is a separation between management and ownership within the company.

The empire-building theory flows from the agency theory, discussed by Jensen and Meckling (1976). They define an agency relationship as "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent." They mention that "if both parties to the relationship are utility maximizers there is good reason to believe that the agent will not always act in the best interests of the principal."¹¹² The principal can limit divergences from his interest by establishing appropriate incentives for the agent and by incurring monitoring costs designed to limit the aberrant activities of the agent. (...) In most agency relationships the principal (...) will incur positive monitoring (...) costs, and in addition there will be divergence between the agent's decisions and those decisions which would maximize the welfare of the principal."¹¹³ The monitoring costs and the dollar equivalent of the reduction in welfare experienced by the principal due to this divergence are agency costs.¹¹⁴ Jensen and Meckling (1976) presume that the relationship between the shareholders and the manager of a corporation fits the definition of a pure agency relationship.

¹¹² A conflict of interests then appears.

¹¹³ Jensen and Meckling, 1976, 308.

¹¹⁴ In addition to the monitoring costs and the reduction in welfare, bonding costs form part of the agency costs. Bonding costs can be described as the costs incurred by the agent in order to make clear to the principal that he is serving the principal's interest.

If shareholders could perfectly monitor and control the investment decisions of managers, acquisitions that reduce shareholder wealth because they deliver managerial benefits would not be allowed. However, due to information asymmetry between shareholders and managers, monitoring by the shareholders might not be perfect, clearing the way for managers to choose projects that serve their own goals. Under these circumstances, when investments provide managers with particularly large personal benefits they are willing to sacrifice the market value of the firm to pursue these investments. Conflicts of interests then appear. Put differently, according to the empire-building theory, managers are prepared to overpay for targets with high private benefits.¹¹⁵ The buyer's shareholders then experience a decrease in the value of their shares, i.e. a reduction in their welfare. Different lines of thought about the way managers maximize their utility can be distinguished. They will be discussed below.

3.2.2.2 *Diversification*

Managers may try to maximize their utility by acquiring unrelated companies. In doing so, they diversify their personal portfolio and reduce their own risk. Managers might enter new lines of business to assure the survival and the continuity of the firm and the maintenance of their job, whereas shareholder wealth maximization may dictate shrinkage or liquidation. Further, managers could have an incentive to enter new businesses at which they might be better.¹¹⁶

Because of these personal benefits that managers can achieve from diversifying acquisitions, they may tend to overpay for them, thereby reducing the wealth of their shareholders. As mentioned earlier, it is easier and cheaper for the shareholders to diversify by themselves: when they buy shares in unrelated businesses to diversify their portfolio, they do not have to pay a premium to get control in the company.¹¹⁷

115 Morck et al., 1990, 31.

116 Morck et al., 1990, 33; Berkovitch and Narayanan, 1993, 349-350.

117 It should be mentioned that in the course of time opinions on diversification have changed. In the sixties and seventies many conglomerate mergers were established. By then, it was argued that diversifying operating activities into different industries attributed to a reduction of company and shareholders' risk. However, starting from the eighties arguments for specialization of the company took root. From then on, it has been argued that shareholders can diversify their investments themselves and that specialization leads to synergies whereas diversification does not, or only to a lesser extent. In the eighties, raiders started splitting up conglomerates. This is where the opinion on diversification changed. It is now viewed as empire-building (e.g. Rappaport, 1998).

3.2.2.3 *Buying growth*

It is further argued that managers maximize their utility by realizing growth of their company. The acquisition of other companies increases the size of the combined company. The bigger the company, the higher the salaries, the perquisites, the power and the fame for the managers. Moreover, the growth of the company could create attractive promotion opportunities for its (junior) managers. Buying growth by acquiring other companies may also ensure the long-term survival of the corporation as an independent entity.¹¹⁸

3.2.2.4 *Management entrenchment*

Shleifer and Vishny (1989, 123) argue that managers make specific acquisitions to increase their own value to their shareholders. "By making such acquisitions, managers can reduce the probability of being replaced, extract higher wages and larger perquisites from shareholders and obtain greater latitude in determining corporate strategy."

They state that "managers can try to assemble portfolios of businesses that they can run more profitably than potential replacements. Moreover, managers will buy assets that entrench them even if these acquisitions reduce shareholder wealth. Pursuit of entrenchment often leads managers to expand existing lines of business excessively. When the incumbent is considered a star performer in one of the firm's main businesses, he has an incentive to commit more resources to that business, even when the marginal investment has a negative net present value. If, on the other hand, it becomes clear to the incumbent that potential replacements would run the firm's existing businesses better than he, he has an incentive to diversify into areas where he has a comparative management advantage."¹¹⁹

3.2.2.5 *Investing free cash flow*

The free cash flow theory of acquisitions, as introduced by Jensen (1986, 323), suggests that managers of firms with unused borrowing power and large free cash flow might undertake acquisitions that are value-destroying to their shareholders. Free cash flow is cash flow in excess of cash required to fund all projects that have positive net present values when discounted at the relevant cost of capital. When the manager takes the interests of the shareholders into account, he should pay the free cash flow to them, or he should use the free cash flow to repurchase shares instead of paying for acquisitions with negative net present values. However, these actions reduce the resources under the manager's control, thereby reducing the power of the manager and making it more likely he will incur the monitoring of the capital markets,

118 Morck et al., 1990, 33.

119 Shleifer and Vishny, 1989, 134.

which occurs when the firm must obtain new capital. Consequently, conflicts of interest between shareholders and managers may arise. Jensen (1986) argues that companies most likely to be subject to the free cash flow theory are companies in industries that apparently generate large cash flows with few growth opportunities.¹²⁰ Those companies are referred to as cash cows and tend to have good performance prior to the acquisition. This good performance generates the free cash flow for the acquisition. As the growth opportunities in the business of the acquirer are slight, the manager of the acquiring company will aim for targets from other businesses.

3.2.2.6 *Bidder rather than target*

Harris (1994, 263) introduces a theory that answers the question why one firm is the seller and the other the buyer in single-bidder, synergistic acquisitions. After all, when an acquisition creates value, the shareholders of the seller and the shareholders of the buyer do not share those gains equally: in general, target firms obtain most of the gains. Then, why is one of the two firms necessary for the creation of the gain willing to be the buyer? Harris (1994, 264) assumes that “although a firm’s shareholders are likely to be better off if their firm is the target rather than the bidder, the firm’s manager may be better off if his firm is the bidder, since the target’s manager usually loses his job following a takeover, whereas the bidder’s manager usually retains his. A manager’s fear that the firm with which his firm can create synergy gains will take over his firm, if his firm does not take it over, makes him want his firm to be the bidder”. Harris suggests that the less efficient, higher-perquisite-consuming manager may be more likely to control the surviving firm, as such a manager may have more to lose if he is displaced and, therefore, will be more desirous of having his firm be the buyer.

Schenk (2006) adds to this point of view by arguing that uneconomic mergers seem to be a natural result of competition among the few. In this context he mentions the minimax regret theory. He states that this competition encourages behavior that is not primarily driven by the wish to create value but by the behavioral peculiarities of strategic interdependence. According to Schenk, this may even result in an extremely costly merger wave.

3.2.2.7 *The empire-building theory and purchased goodwill*

When the empire-building theory applies, the overpayment for the acquisition will lead to negative returns to the acquirer’s shareholders, and to positive returns to the target’s shareholders. It will also positively influence purchased goodwill. As value will be destroyed, total returns will decrease.

120 Jensen, 1986, 328.

3.2.3 The hubris theory

In this section the hubris theory, proposing that overconfidence may lead to mistakes in valuation of the target, is further expounded. Also the effect of hubris on purchased goodwill is discussed.

3.2.3.1 *The hubris theory further explained*

The hubris theory, as introduced by Roll (1986), states that an acquisition results from mistakes in valuation of the target. Due to overconfidence about his own performance, the manager of the acquiring company overestimates the value creation resulting from an acquisition, and, accordingly, the price he is prepared to pay for the target. He may convince himself that his valuation is right and that the market reaction to the acquisition announcement does not reflect the full economic value of the combined company.

Roll states that the valuation of the target company by the buyer's manager can be considered as a random variable whose mean is its current market price. When the random variable exceeds its mean, an offer is made. Offers take place only when the valuation is too high. Outcomes in the left tail of the distribution are not observed, as a valuation of a potential target below its current market price will not lead to a bid. The takeover premium therefore can be considered as a random error, a mistake made by the manager of the bidding firm.

Roll's hypothesis is based on the assumption that an individual may not behave as a rational economic human being. He mentions that markets behave as if they were populated by rational economic human beings. However, he states, "a market actually populated by rational beings is observationally equivalent to a market characterized by grossly irrational individual behavior that cancels out in the aggregate, leaving the trace of the only systematic behavior component, the small thread of rationality that all individuals have in common."¹²¹ He argues that corporate takeovers are an area of economic research in which economic irrational behavior has to be taken into account. After all, they are decisions of individuals. According to Roll, as the average individual manager has the opportunity to make only a few takeover offers during his career, there is little reason to expect that a particular individual bidder will refrain from bidding because he has learned from his own past errors.

It is mostly assumed that when this theory is strictly applied there is no value creation at all for the combined company arising from the acquisition. However, in cases where gains do exist, at least part of the takeover premium could still be caused by valuation-error and hubris.

121 Roll, 1986, 199.

3.2.3.2 *The hubris theory and purchased goodwill*

Roll (1986, 215) mentions that if hubris occurs around an acquisition, the combined value of the seller and the buyer should remain the same or fall slightly, the value of the buyer should decrease, and the value of the seller should increase. Therefore, the acquirer's shareholder returns will decrease, the target's shareholder returns will increase, and total returns will remain unchanged or slightly decrease. The amount of purchased goodwill, as it corresponds to target returns, will be positively influenced by hubris.

3.2.4 Other factors influencing returns and their division between acquirer and target

Other factors that influence returns or their division between acquirer and target are the bargaining position and misvaluation by the stock market. In this section, both are discussed. Moreover, this section considers the effect of bargaining and misvaluation on purchased goodwill.

3.2.4.1 *Bargaining position*

Although there is a maximum price that the buyer is prepared to pay for an acquisition, the actual purchase price of the acquisition will lie somewhere in between this maximum price and the target's market value before the takeover announcement. This purchase price depends on the bargaining position of both buyer and target. One of the arguments brought up in literature is that the bargaining position depends on the number of actual and potential competitors for each target.¹²² A larger number will result in a higher purchase price for the acquisition.

Another argument found in literature is that the means of payment influences the bargaining position. It is stated that cash payments result in higher target returns compared to stock payments. This higher return is argued to be compensation for the capital gains tax liability of the target shareholders, which crystallizes immediately with a cash payment.¹²³ A hybrid offer then is likely to fall between a cash offer and a share offer.

The bargaining position may also depend on the number and voice of the shareholders of the seller. According to Grossman and Hart (1981), a buyer pays the maximum acceptable price for the shares of the seller to gain control of it, when the shareholders of the seller are atomistic (i.e. each shareholder has one share). They argue that when the seller's shareholders are atomistic, these shareholders will behave like free riders when the buyer offers a lower price for their shares than the maximum acceptable one: they

122 e.g. Bradley et al., 1988.

123 Sudarsanam, 1996.

will keep their shares and will join the value creation of the combined company after the acquisition. To gain control of the seller, the buyer will have to pay the maximum acceptable price for its shares, otherwise the acquisition will fail. In that case, the total value created will accrue to the seller's shareholders. In case of managerial ownership also, resistance against the bid by the target management may lead to higher target returns. It is stated that where managerial ownership is used to negotiate, but not ultimately block an acquisition, it has a positive impact on target returns.¹²⁴ The same may occur in case of a blockholder who is not the manager of the seller. If the blockholder's fraction of the shares is of overriding importance for the buyer to gain control, the buyer will pay a substantial premium to the blockholder. In these cases, the largest part of the total value created will accrue to the seller's shareholders.

Other factors that might influence the bargaining position and the price set are tactical bargaining skills and objectives, the availability of other target firms that might similarly satisfy the acquirers' objectives, competing but qualitatively different transaction opportunities that may have been available to acquirer and target, and temporary urgency.¹²⁵

3.2.4.2 *Misvaluation by the stock market*

The misvaluation theory states that due to information asymmetry between stock market and management of a company, the stock market may value the shares of this company incorrectly. Two theories that come under the misvaluation theory are the pecking order theory and the signalling hypothesis.

Myers and Majluf¹²⁶ (1984) introduced the *pecking order theory*. They argue that if acquirer's management has private information that acquirer's shares are undervalued by the stock market, it will prefer cash offers to stock

124 Song and Walkling, 1993; Stulz, 1988.

125 Slusky and Caves, 1991.

126 A more extensive explanation of Myers and Majluf's pecking order theory is that they argue that due to information asymmetry between investors and the management of a company, the market generally reacts negatively to seasoned equity issues. Hence, these companies have high equity issuance costs. When managers have superior information, and stock is issued to finance investment, stock price will fall. If the firm issues safe (default-risk-free) debt to finance investment, stock price will not fall.

They present a model of the issue-invest decision when the firm's managers have superior information. They state that it is generally better to issue safe securities than risky ones. Firms should go to bond markets for external capital, but raise equity by retention if possible. That is, external financing using debt is better than financing by equity. As a result, firms whose investment opportunities outstrip operating cash flows, and which have used up their ability to issue low-risk debt, may forego good investments rather than issue risky securities to finance them. This is done in the existing stockholders' interest. However, stockholders are better off *ex ante* – i.e. on average – when the firm carries sufficient financial slack to undertake good investment opportunities as they arise.

exchange offers when acquiring another company. On the other hand, if it considers its shares overvalued, it will prefer to make stock exchange offers instead of cash offers. Consequently, the stock market interprets cash offers as good news and stock exchange offers as bad news about the bidders. Bidding firms' returns then turn out to be negative in pure stock exchange acquisitions, but 'normal' in cash offers. The payment method in fact alleviates the information asymmetry between bidders and target shareholders.

Both Fishman (1989) and Berkovitch and Narayanan (1993) emphasize private information about synergies as the prime determinant of the form of financing (*signalling hypothesis*). Fishman (1989) suggests that cash payments are made to signal a high valuation for the target to pre-empt a potential competing bidder. Berkovitch and Narayanan develop a model in which high-synergy bidders use cash offers and in which low-synergy bidders use stock exchange offers.

Further, it is argued that companies can become targets not only because their managers have erred in failing to maximize profits, but also because the stock market has erred, "setting share prices so low as to make their issuer a bargain worth snapping up". Thus, premiums may be paid to gain control of undervalued companies even when no efficiency gains are expected to result from the ownership change.¹²⁷

3.2.4.3 Bargaining, misvaluation, and purchased goodwill

The effect of bargaining on purchased goodwill is clear: the stronger the position of the target in the negotiations, the higher the amount of goodwill, and vice versa.

From the misvaluation hypotheses, it can be concluded that stock exchange payments negatively influence acquirer stock returns, whereas target's shareholders mostly benefit from cash payments and from acquisitions resulting from undervaluation.

3.3 STATE OF THE ART OF RESEARCH INTO ACQUISITION THEORIES

Numerous studies have been carried out to find evidence for the different acquisition theories. Table 3-6 at the end of this chapter gives an overview of the different studies and their outcomes. The table discusses the acquisition theories examined, the sample used, the focus of the study, the method and dependent variables, and summarizes the outcomes of the studies. Many studies test for different acquisition theories simultaneously, and most of them make use of control variables to correct for misvaluation effects and characteristics influencing the bargaining position. Most studies use multivariate regression analyses to test for plausibility of the acquisition

¹²⁷ Scherer, 1988.

theories. They often make use of total, acquirer or target returns as dependent variables.

Results show support for all acquisition theories. Below, the studies and their outcomes are discussed.

3.3.1 Research into the efficiency theory

Bradley et al. (1988) estimate the magnitude of synergistic gains in successful tender offers, using the combined excess returns of acquirer and target shareholders (=total returns) as a basis. They find that successful tender offers¹²⁸ on average increase the combined value of the target and acquiring firms, which supports the efficiency theory. Berkovitch and Narayanan (1993) distinguish among the efficiency (synergy), agency, and hubris hypotheses when considering correlations between target and total returns. Their empirical results show that synergy is the primary motive in takeovers with positive total returns. Also Gupta and Misra (2007) distinguish among the three different hypotheses. They find positive total returns, indicating value creation of the acquisitions. They further find that the estimates for deal size and relative bid premium positively influence total returns when they are positive, whereas the estimate for deal size negatively influences total returns when they are negative. Both Servaes (1991) and Lang et al. (1989) show results that are consistent with the view that takeovers of poorly-managed targets by well-managed bidders have higher bidder, target, and total returns. They thereby make use of Tobin's q , the firm's market value divided by its book value, as a measure for managerial performance.

Asquith et al. (1983) examine the effect of mergers on the wealth of bidding firms' shareholders and find that bidding firms gain significantly during the announcement period. They further find that these bidder returns are positively related to the relative size of the merger partners, and that they are larger for successful merger attempts.¹²⁹

Bhagat et al. (2005), while estimating the takeover improvements making use of an accurate probability scaling model, find that improvements are even larger than traditional methods indicate.

Ismail and Davidson (2007) concentrate their research on target returns in the banking sector. They find that European cross-border acquisitions tend to generate higher returns than national acquisitions and show some significant explanatory variables that point to the importance of efficiency in the European financial services industry. Slusky and Caves (1991) test hypotheses about the creation of value by mergers on premia paid. They find that premia increase with financial although not with real synergies.

128 i.e. tender offers that actually result in an acquisition by the bidder.

129 i.e. merger bids that actually result in a merger.

3.3.2 Research into the empire-building theory

Numerous studies have examined the empire-building theory. Some studies use Tobin's q , the firm's market value divided by book value, or comparable characteristics, as a measure of managerial performance. Among them are Lang et al. (1989), Han et al. (1998), Dong et al. (2006), and Moeller et al. (2005). Lang et al. (1989) show that shareholders of well-managed bidders earn significant stock excess returns in successful tender offers while the shareholders of poorly-managed bidders lose. Han et al. (1998) find a significantly positive relation between the bidder earnings-price ratios and book-to-market ratios¹³⁰ on the one hand and bidder returns on the other. These results support the view that bidders tend to overpay to complete acquisitions. Also the results of Dong et al. (2006) show that low Tobin's q bidders lose in acquisitions.¹³¹ Moeller et al. (2005) follow another approach. They test the hypothesis advanced by Jensen (2003) that high valuations increase managerial discretion, making it possible for managers to make poor acquisitions when they have run out of good ones. The results of their study support this hypothesis.

Lang et al. (1991), Harford (1999), and Smith and Kim (1994) test for the free cash flow theory. Lang et al. (1991) show that the relation between cash flow and bidder returns differs significantly for low Tobin's q and high Tobin's q bidders; whereas bidder returns are significantly negatively related to cash flow for low Tobin's q bidders, they are not so for high Tobin's q bidders. Harford (1999) shows that cash-rich firms are more likely than other firms to attempt acquisitions and that their acquisitions are value-decreasing. Furthermore, these cash-rich firms are more likely to make diversifying acquisitions and their targets are less likely to attract other bidders. This evidence supports the agency costs of free cash flow explanation for acquisitions by cash-rich firms. Also Smith and Kim's research (1994) supports the free cash flow hypothesis. Their results show that bids combining slack-poor firms and firms with free cash flow limit the discretion of managers, so that overinvestment is avoided.

Examples of studies that test for factors limiting the discretion of managers when explaining agency behavior are Datta et al. (2001) and Maloney et al. (1993). While examining how equity-based compensation determines corporate acquisition decisions, Datta et al. (2001) conclude that executive stock option grants provide effective and strong motivation for managers to make value-maximizing investment decisions. Maloney et al. (1993) document a positive relation between the price reaction to the acquiring firm at project announcement and its pre-announcement leverage

130 Book-to-market ratios are characteristics of managerial performance, comparable to Tobin's q (the inverse).

131 However, Dong et al. (2006) do not show higher bidder stock returns by well-managed bidders.

position, which supports the argument that leverage enhances the decision-making of the acquirer's management, thereby reducing agency behavior. Also Slusky and Caves (1991) show that the acquirers' willingness to pay increases with their scope for managerial behavior.

Berkovitch and Narayanan (1993) and Morck et al. (1990) also find evidence for agency behavior in acquisitions. Berkovitch and Narayanan (1993) distinguish among the efficiency (synergy), agency, and hubris hypotheses by looking at the correlation between target and total returns. Their empirical results show that synergy is the primary motive in takeovers with positive total returns, whereas agency is the primary motive in takeovers with negative total gains. Morck et al. (1990) find that returns to bidding shareholders are lower when their firm diversifies, when it buys a rapidly growing target, and when its managers performed poorly before the acquisition. These results suggest that managerial objectives may drive acquisitions that reduce bidding firms' values.

3.3.3 Research into the hubris theory

Both Doukas and Petmezas (2007) and Malmendier and Tate (2005) find evidence for the hubris theory. Doukas and Petmezas (2007) examine whether acquisitions by over-confident managers generate superior stock excess returns and whether managerial over-confidence stems from self-attribution. Their results support the theory that managers tend to credit the initial success to their own ability and therefore become over-confident and engage in more deals. Malmendier and Tate (2005) find that investment of over-confident CEOs is significantly more responsive to cash flow compared to the investment of CEOs who are not over-confident, particularly in equity-dependent firms. Their results support the theory that over-confident managers overestimate the returns to their investment projects and view external funds as unduly costly. Thus, they overinvest when they have abundant internal funds, but curtail investment when they require external financing. Also Berkovitch and Narayanan (1993), when testing for synergy, agency, and hubris, find strong evidence of the hubris theory, especially in their positive total gain subsample.

3.3.4 Research into bargaining and the misvaluation theory

3.3.4.1 *Research into factors influencing the bargaining position*

The characteristics influencing the bargaining position of bidder and target and their effect on the division of the total gain or loss between acquirer and target have also been investigated. Song and Walkling (1993) examine the relationship between managerial ownership and the probability of being a target firm, and the impact of managerial ownership on target shareholder

returns. Their findings are that targets have lower managerial ownership than either their industry counterparts or randomly selected non-targets. Managerial ownership is significantly lower in contested as compared to uncontested offers, and in unsuccessful as compared to successful cases. Managerial ownership is significantly related to stock excess returns in contested cases that are ultimately successful. The results are consistent with a positive impact of managerial ownership where it is used to negotiate, but not ultimately block, an acquisition. Jarrell and Poulsen (1989) examine characteristics of tender offer bids that may determine the returns earned by the shareholders of acquiring firms. They find that relative size of the target to the acquiring firm plays a large role in determining returns to acquirers. In addition, increased competition for the target significantly lowers returns to the acquiring firm's shareholders.

Huang and Walkling's results (1987) show that tender offers yield significantly higher target returns than mergers do. However, after controlling for form of payment and degree of resistance, no significant difference remains between merger and tender offer. Resisted offers earn statistically insignificantly higher target returns than unresisted offers. Cash offers are associated with significantly and substantially higher returns both before and after controlling for type of acquisition and degree of resistance. Also Slusky and Caves (1991) find that the presence of both actual and potential rival bidders has a powerful effect. Bradley et al. (1988) show that competition among bidding firms increases the returns to targets and decreases the returns to acquirers.

3.3.4.2 *Research into the misvaluation theory*

Section 3.2.4.2 displayed two theories that came under the misvaluation theory: the pecking order theory and the signalling hypothesis. Both the pecking order theory and the signalling hypothesis predict that cash offers will result in higher bidder returns than equity offers around the announcement date of the takeover. Travlos (1987) shows that bidding firms indeed suffer significant losses in pure stock exchange acquisitions, whereas they experience 'normal' returns in cash offers. He shows that these findings are attributed mainly to signalling effects. Also Dong et al. (2006), while testing for both the misvaluation theory and the relationship between managerial performance (measured by Tobin's q) and bidder gains, find evidence which is broadly consistent not only with the empire-building theory but also with the misvaluation hypothesis.

Smith and Kim's (1994) results too are consistent with the misvaluation theory. Their results support the hypothesis that bids combining slack-poor firms and firms with free cash flow resolve information asymmetry between the stock market and firm's management. Also Han et al. (1998) examine the effect of the method of payment on bidder returns at the announcement of mergers and tender offers and conclude that the information effect of the method of payment is empirically supported. Sung (1993) is the

only researcher who examines which version of the information-related hypotheses (the pecking order hypothesis or the signalling hypothesis) better explains the financing choice of takeover activities. His evidence is consistent with the pecking order hypothesis, but not with the signalling hypothesis.

From the above it can be seen that the results of analyses explaining stock excess returns support the efficiency theory that acquisitions create value. These analyses provide some useful characteristics of value-creating acquisitions. However, the empire-building theory, the hubris theory, bargaining factors, and the misvaluation theory are also supported by these researches. In other words, stock excess returns are also explained by other acquisition theories. Therefore, in the research into goodwill as a measure of value creation, characteristics of other theories explaining goodwill should also be taken into account.

3.4 STATE OF THE ART OF RESEARCH EXPLAINING TARGET RETURNS AND BID PREMIUMS

After having discussed the results of previous research into these acquisition theories in general, and after having found that each of the theories is supported by evidence, now the part of the research into theories explaining target stock excess returns and bid premiums will be discussed in more detail.¹³²

Studies that almost exclusively focus on the impact of the theories on target stock excess returns and bid premiums, and are therefore very useful for this research, are: Slusky and Caves (1991), Ismail and Davidson (2007), and Huang and Walkling (1987).

Slusky and Caves (1991) test two hypotheses regarding the creation of value by mergers on premia paid in acquisitions. They expect (1) that the value creation can be ascribed to synergies in the coordination of business assets, and (2) that the value creation can be attributed to gains from shifting control of assets into the hands of more effective managers. They state that the premium paid in a complete merger, PR, can be related to the target's stand-alone market value (MV) in the following expression:

$$PR = (BRES [X_i] / MV) B(Z_i)$$

where BRES is the reservation price of the acquirer. This reservation price depends on factors (X_i) that predict the increase in cash flows due to combining the assets or improving target's management's policies (in accordance with the efficiency theory), but also any factors that represent the

¹³² After all, it is assumed that goodwill moves in line with target stock excess returns and with bid premiums.

acquirer's management's willingness to pay for the targets (in conformity with the empire-building theory). B then is a bargaining function that determines where the actual purchase price falls between the reservation price and the market value of the target, and Z_i represents the factors determining this bargaining position.

Making use of multivariate regression analyses (with bid premium as dependent variable), they test for their hypotheses. Their results show that premia increase with financial although not with real synergies and with the scope for managerial behavior (= agency behavior) in the target firms. The acquirers' willingness to pay also increases in relation to their scope for managerial behavior. They further find that the presence of either actual or potential rival bidders has a powerful effect.¹³³

Ismail and Davidson (2007) examine factors influencing announcement period stock excess returns for target banks in European bank mergers. Although their explicit focus is on the banking sector, some of their assumptions and results seem to be relevant while explaining goodwill. For instance, they examine whether the new business combinations are creating synergies by considering the effect of relative size on target excess stock returns. This effect turns out not to be significant in their research. Further, they study the effect of other factors on target stock excess returns, including the form of payment (cash, equity, or a combination) and the form of the acquisition on target excess stock returns. They find that cash deals and deals that are settled by a mix of cash, equity, and loans create significantly higher target stock excess returns than equity transactions. They do not find a significant effect of the form of the acquisition on target excess stock returns.

Huang and Walkling's (1987) research mainly provides information about the other factors that may determine goodwill. They test three hypotheses about target firm announcement returns, namely that target stock excess returns will be higher (1) in tender offers than in mergers; (2) in cash offers than in stock offers, and (3) in resisted offers than in unresisted offers. Their results show that tender offers yield significantly higher returns than mergers. Tender offers, however, are generally for cash and are more likely to be resisted than mergers. After controlling for form of payment and degree of resistance, no significant difference remains between merger and tender offer. Resisted offers earn statistically insignificant higher returns than unresisted offers. Cash offers are associated with significantly and substantially higher returns both before and after controlling for type of acquisition and degree of resistance.

Other studies that are useful to be taken into consideration when explaining goodwill, as they not only consider the effects of acquisition

133 Further, they ascertain that market gains (losses) to acquirers' shareholders do not distort the associations between acquisition premia and sources of value by substituting the market-adjusted change in value of acquirer divided by the stand-alone market value of the target (APR) for the bid premium (PR) in the models. The outcomes of this extra analysis confirm their earlier results.

theories on total returns or acquirer returns but also on target returns, are Bhagat et al. (2005), Dong et al. (2006), Lang et al. (both their 1989 and 1991 articles), Servaes (1991), Datta et al. (2001), and Gupta and Misra (2007).

Making use of the advanced probability scaling method, Bhagat et al. (2005) show that tender offers are value-creating. They further find evidence in line with the hypotheses for the effects of the form of payment, resistance to the offer, and relative size on target returns.

Dong et al. (2006), Lang et al. (1989), and Servaes (1991) focus on the so-called *q* hypothesis of takeovers. They test whether takeovers of bad targets by good acquirers tend to improve efficiency more than takeovers of good targets by bad acquirers.

Using Tobin's *q* or market-to-book value as a proxy for expected growth or managerial effectiveness, and making use of multivariate regression analyses, their results show that a higher target Tobin's *q* or market-to-book value is associated with lower bid premiums and target announcement period return. Apart from Servaes' study,¹³⁴ they further show that a higher bidder's Tobin's *q* or market-to-book value is associated with higher target stock returns.

While testing for agency (empire-building), Datta et al. (2001) show that acquirers with a relatively low equity-based compensation pay a higher acquisition premium compared to acquirers with a relatively high equity-based compensation.

Gupta and Misra (2007) test for the relation between total returns, relative size, and bid premiums. Their results show that in value-reducing acquisitions, target returns are negatively influenced by both relative size of target to acquirer and stock payment.

Further evidence into the impact of relative size, form of payment, form of acquisition, and leverage on target return has also been found in some other studies in this section, often as control variables.

It is observed that in the studies focusing on the impact of the theories on target returns and bid premiums, no research is done on the hubris theory or the misvaluation theory.

The reason is that these theories are mainly demonstrated with acquirer stock excess returns or with a combination of acquirer stock excess returns, target stock excess returns, and combined stock excess returns. As acquirer stock excess returns and combined stock excess returns are beyond the focus or not the main focus of many of these studies on target returns and bid premiums, these theories are not tested.

Founded on these studies, Table 3-1, Table 3-2, and Table 3-3 summarize characteristics of the efficiency theory, empire-building theory and other factors respectively and show the effect of each of the characteristics on target return or bid premium, expected as well as actual.

134 In Servaes' study (1991), bidder's *q* ratio fails to enter the regression significantly.

Table 3-1: *The efficiency theory – characteristics and their effect on target returns; empirical evidence*

Form of value creation	Characteristic	Explanation	Expected effect on target return or bid premium	Results
Operating synergies	Relatedness of businesses	Relatedness increases synergies when merging	Positive	Not significant Slusky and Caves (1991)
Operating synergies	Relative size (target to acquirer)	Realized synergies for target company higher when target is small compared to acquirer	Negative	Significant and in line with expectation Lang et al. (1991) Bhagat et al. (2005) Dong et al. (2006) Not significant Ismail and Davidson (2007)
Financial synergies	Difference between target's and acquirer's leverage	Discrepancy between the two firms' levels of financial stringency can make a merger valuable. A merger can absorb the slack from either partner, although primacy from acquirer's slack is suggested	Positive (either absolute or algebraic)	Significant and in line with expectation (algebraic) Slusky and Caves (1991)
Improved management	Target Tobin's q or target market-to-book value	The value potentially created by a merger and thus the maximum premium paid should increase with the target's management underperformance	Negative	Significant and in line with expectation Lang et al. (1989) Lang et al. (1991) Servaes (1991) and Dong et al. (2006)
Improved management	Acquirer Tobin's q or acquirer market-to-book value	The value potentially created by a merger and thus the maximum premium paid should increase with acquirer's management performance/quality	Positive	Significant and in line with expectation Dong et al. (2006) Not significant Lang et al. (1989) Servaes (1991)

Table 3-2: The empire-building theory – characteristics and their effect on target returns; empirical evidence

Testing for agency behavior of	Characteristic	Explanation	Expected effect on target return or bid premium	Results
Target's management	Fraction of target's shares held by corporate officers and members of the board of directors	Outcome ambiguous : entrenchment hypothesis or incentive alignment hypothesis	Entrenchment hypothesis: possibly positive Incentive alignment hypothesis: negative	Almost significant at the 10 percent level and in line with incentive alignment hypothesis Slusky and Caves (1991)
Target's management	Fraction of target's shares not held by officers and directors that are in the hands of individual shareholders owning five percent or more of the firm's outstanding equity shares	Premium will decrease with fraction of shares held by individual shareholders owning five percent or more (monitoring effect)	Negative	Significant and in line with incentive alignment hypothesis Slusky and Caves (1991)
Target's management	Fraction of members of the board of directors who are officers of the company	Directors who are outsiders monitor managers more efficiently	Positive	Not significant Slusky and Caves (1991)
Acquirer's management	Acquirer's leverage	Higher leverage disciplines acquirer's management (because of monitoring) and will result in lower bid premiums	Negative	Significant and in line with expectation Dong et al. (2006)
Acquirer's management	Fraction of acquirer's shares held by corporate officers and members of the board of directors	The acquiring firm's owners fare worse, the lower the fraction of shares held. The bid premium therefore will decrease with fraction of shares held.	Negative	Significant and in line with expectation Slusky and Caves (1991)
Acquirer's management	Fraction of acquirer's shares not held by officers and directors that are in the hands of individual shareholders owning five percent or more of the firm's outstanding equity shares	Premium will decrease with fraction of shares held by individual shareholders owning five percent or more (monitoring effect)	Negative	Not significant Slusky and Caves (1991)
Acquirer's management	Fraction of members of the board of directors who are officers of the company	Premium will increase with fraction of members of the board of directors who are officers of the company	Positive	Significant and in line with expectation Slusky and Caves (1991)

Table 3-3: Other factors - characteristics and their effect on target returns; empirical evidence

Other factors	Characteristic	Explanation	Expected effect on target return or bid premium	Results
Method of payment	Cash payment	The tax hypothesis implies higher returns for cash offers	Positive	Significant and positive Huang and Walkling (1987) Ismail and Davidson (2007) Not significant Lang et al. (1991) Servaes (1991)
Method of payment	Stock payment	The tax hypothesis implies lower returns for stock offers	Negative	Significant and negative Gupta and Misra (2007) Bhagat et al. (2005)
Hostile offer: shareholder welfare hypothesis	Hostile offer	Managerial resistance to an acquisition offer is in the interest of target's shareholders resulting in higher target returns	Positive	Significant and in line with hypothesis Huang and Walkling (1987) Bhagat et al. (2005)
Number of bidders	More than one bidder		Positive	
Form of acquisition	Merger or tender offer	Merger agreements allow separate payment of control premiums to those parties that require it, whereas in tender offers all shareholders will receive a control premium. Therefore, target shareholders will earn lower premiums in mergers	Positive for tender offers	Significant and in line with hypothesis Not significant Huang and Walkling (1987) Ismail and Davidson (2007) ¹³⁵

135 Ismail and Davidson (2007) distinguish between acquisitions and mergers instead of tender offers and mergers.

3.5 HYPOTHESES 5 TO 7 EXPLAINING GOODWILL

3.5.1 Introduction

This study focuses on goodwill as a measure of value creation: hypotheses about creation of value by mergers are tested on purchased goodwill. In this chapter, acquisition theories that may help us to explain goodwill and previous research into these theories have been discussed. An acquisition theory that serves to explain goodwill from value creation is the efficiency theory. This theory has been demonstrated by previous studies. It states that merger bids are initiated by managers to create value. In accordance with this theory, it is assumed that value creation flows from operating and financial synergies and improved management. Previous studies show that in addition to the efficiency theory, other acquisition theories also take root. Among them are the empire-building theory and the hubris theory. Further, factors determining the bargaining position and misvaluation are demonstrated. These factors, together with empire-building and hubris, might affect purchased goodwill and are to be taken into account when explaining goodwill from value creation.

This study builds on previous research into acquisition theories and other factors determining purchase prices, as discussed in this chapter. Most of the research into acquisition theories concerns stock excess-returns analyses. When explaining goodwill from value creation, this study concentrates on research approaches of previous studies that tested for the efficiency theory and for the other theories and factors on target returns and bid premiums, as it may be assumed that goodwill moves in line with them. The next section accounts for the accompanying research question (II), sub-question (II) a. Further, hypotheses 5 to 7 will be introduced.

3.5.2 Hypotheses 5 to 7 based on second research question

The *second research question* of this dissertation (see also section 1.2) was as follows:

(II) Does goodwill under the new accounting regime provide information on expected value creation of the acquisition?

To answer this second research question, it is examined whether the known characteristics of value-creating acquisitions as conducted by the efficiency theory and proved by excess returns analyses also apply to purchased goodwill. In these analyses, the effect of characteristics of other theories explaining acquisitions on purchased goodwill as shown by excess returns-analyses are taken into account.

Consequently, the second research question leads into the following *sub-question*:

- (II) a What is the effect of the characteristics of the efficiency theory on purchased goodwill under the new accounting regime?

Characteristics derived from earlier research into the efficiency theory that serve to explain goodwill from value creation, and their expected effect on goodwill, are shown in Table 3-4.

The table shows that relatedness of business and relative size of target to acquirer are characteristics of operating synergies. From previous studies it flows that operating synergies are higher when acquirer and target are in the same industries. It further follows that operating synergy effects are higher when the target company is smaller in comparison to the acquiring company. A characteristic of financial synergies is the difference in leverage between target and acquirer. Discrepancy between the two firms' levels of financial stringency can make a merger valuable. In line with the results of Slusky and Caves (1991) in this research, a primacy in acquirer's slack is expected, although in theory it is stated that a merger can absorb the slack from either partner. Further, in line with the improved management hypothesis it is expected that the value potentially created by an acquisition and thus the maximum premium paid should increase with acquirer's management performance. It is further expected that the maximum premium paid should increase with the target's management underperformance, as management improvement opportunities can then be achieved. In accordance with other studies, the quality of management of both acquirer and target is expressed by Tobin's q .

From this state of the art of research on value creation by mergers and acquisitions, when applying the efficiency theory to purchased goodwill, *hypotheses 5 to 7* are formulated. These hypotheses correspond to research question II and sub-question II a, and read as follows:¹³⁶

- Hypothesis 5: The more operating synergy that emerges from the acquisition, the higher the amount of purchased goodwill will be.
 Hypothesis 6: Financial synergy resulting from an acquisition positively influences the amount of purchased goodwill.
 Hypothesis 7: If target's management improves by the acquisition, a higher amount of purchased goodwill is paid.

136 These hypotheses are research hypotheses (or experimental hypotheses). They display the predicted effects. The null hypotheses are their opposites. They state the situation in which there are no predicted effects (see for instance Field, 2005, 23, and Aron et al., 2008, 148-149). When doing the steps of hypotheses testing, a roundabout method will be used: in the empirical research part of this dissertation it will first be tested whether the null hypotheses can be rejected. After having done so it can be decided about their alternatives, the research hypotheses.

Table 3-4: Goodwill and value creation: characteristics from the efficiency theory

Value creation from	Characteristics	Effect on goodwill
Operating synergies	Relatedness of business	Positive
	Relative size of target to acquirer	Negative
Financial synergies	Difference in leverage target to acquirer	Positive
Improved management	Acquirer Tobin's q or market to book value	Positive
	Target Tobin's q or market to book value	Negative

To control for the effect of the characteristics of other theories explaining mergers and acquisitions, other acquisition theories and factors are also to be taken into account when analyzing purchased goodwill as a measure of value creation. It is then tested whether hypotheses 5 to 7 hold when controlling for these other theories and factors.

Table 3-5 summarizes these theories or factors taken into account and the accompanying characteristics. These characteristics are derived from earlier research into the empire-building theory and bargaining. Similar to the studies focusing on the impact of the theories on target returns and bid premiums, no research will be done into the hubris theory or into the misvaluation theory. As explained in section 3.4, these theories are mainly examined with acquirer stock excess returns or with a combination of acquirer stock excess returns, target stock excess returns, and combined stock excess returns. As this research is about goodwill, these theories are not the direct focus of this study.¹³⁷

Among the characteristics to test for the empire-building theory are the fraction of acquirer's shares and the fraction of the target's shares held by corporate officers and members of the board of directors. Regarding the effect these characteristics have on goodwill, Slusky and Caves (1991) and Datta et al. (2001) are followed. They show that the acquiring firms fare worse the lower the fraction of shares their managers hold. With a lower fraction of shares, they are prepared to overpay for the acquisition, which leads to higher goodwill amounts. The bid premium will therefore decrease with fraction of shares held. A comparable line of reasoning can be employed on target firms. The incentive alignment hypothesis argues that target firms

137 Although the hubris theory, the misvaluation theory and the state of the art of research into these theories were comprehensively discussed in section 3.2 and section 3.3, this research does not take them into account when explaining goodwill. The reason behind this is that in order to examine these theories, in addition to the characteristics of these theories and goodwill amounts, information on acquirer, target, and combined stock excess returns is also required. This goes beyond the scope of this research. However, it provides an interesting angle for further research. Nevertheless, it is probable that misvaluation and hubris do affect purchased goodwill. Therefore, to provide a complete picture of the theories explaining goodwill, the misvaluation theory and the hubris theory were discussed.

owners fare worse, the lower the fraction of shares target’s managers hold. A higher fraction of share ownership will reduce empire-building and increase incentive alignment. As a result, fewer opportunities are available for acquiring companies for value creation, resulting in lower purchased goodwill amounts. It is further argued that debt financing disciplines management, leading to lower purchased goodwill amounts. The other factors taken into account mainly regard the bargaining position of acquiring and target company.

Regarding the form of payment, a positive effect of cash payment on purchased goodwill is expected: as gains on cash payments are taxed, relatively higher compensations when paying in cash are expected. Further, it is expected that a tender offer positively influences purchased goodwill, as higher control premiums are involved when compared to mergers. Finally, the number of bidders and target management’s resistance to the offer are expected to positively influence purchased goodwill

Table 3-5: Goodwill and value creation: control variables derived from other theories

Factors to control for	Characteristics	Effect on goodwill
Empire-building	Fraction of acquirer's shares held by corporate officers and members of the board of directors	Negative
	Fraction of target's shares held by corporate officers and members of the board of directors	Negative
	Acquirer's leverage	Negative
Bargaining	Form of payment: cash	Positive
	Form of acquisition: tender	Positive
	Number of bidders	Positive
	Resistance to the offer (hostile offer)	Positive

Hypotheses 5 to 7 will be tested in chapter 6. In the same chapter, research question (II) and sub-question (II) a will be answered.

3.6 SUMMARY AND CONCLUSIONS

This chapter focuses on acquisition theories that may contribute to explaining goodwill. Accordingly, three different theories seem to be relevant: the efficiency theory, the empire-building theory, and the hubris theory.

The *efficiency theory*, which flows on the neoclassical economic theory, states that acquisitions are made in order to obtain synergies, which take shape in cost reductions and better performance and thereby create extra value to the combined company.

The *empire-building theory* claims that acquisitions are planned and executed by the managers of the buyer's company, in order to maximize their own utility instead of the shareholder value. According to the *hubris theory*, the manager of the acquiring company overestimates the value creation resulting from an acquisition, and, accordingly, he is prepared to pay too high a price for the target.

Other determinants that may influence the amount of purchased goodwill consider the bargaining position of the parties and the misvaluation of acquirer or target by the stock market. Although there is a maximum price that the buyer is prepared to pay for an acquisition, the actual purchase price for the acquisition will lie somewhere in between this maximum price and the target's market value before the takeover announcement. Examples of characteristics determining this actual purchase price for the acquisition are form of payment, form of acquisition, number of bidders and resistance to the offer.

Numerous studies have been carried out to find evidence for the different acquisition theories. Results show evidence for all theories.

When explaining goodwill, this study rests on research that tested the efficiency theory or the other theories on target returns and bid premiums. As it may be assumed that goodwill moves in line with target returns and bid premiums, the earlier research on target returns and bid premiums serves as a basis for this study. This study focuses on goodwill as a measure of value creation: hypotheses about creation of value by mergers are tested on purchased goodwill. Characteristics derived from earlier research that serve to explain goodwill from value creation are relatedness of businesses and relative size (operating synergies), difference in leverage between target and acquirer (financial leverage), and acquirer's and target's quality of management as measured by Tobin's q (management improvement).

In order to control for other factors determining purchased goodwill, also characteristics representing other theories and factors explaining purchased goodwill need to be taken into account. Among them are (i) characteristics representing the empire-building theory, i.e. acquirer's leverage and acquirer's and target's managerial ownership, and (ii) characteristics representing other factors, such as the form of the payment, the form of the acquisition, the number of bidders and resistance to the offer.

Table 3-6: Overview of research into acquisition theories

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Asquith et al. (1983)	Synergy	Bidding firms that initiated merger programs in 1963-1979 after a hiatus of at least eight years (214: 70 first bid, 59 second bid, 47 third bid, 38 fourth bid)	Examination of the effect of mergers on the wealth of bidding firms' shareholders	Method: Regression analysis Dependent variable: Acquirer stock excess return Explanatory variables: Size, time, success, order	Bidding firms gain significantly during the 21 days leading to the announcement of each of their first four merger bids. Their returns are positively related to the relative size of the merger partners, and the gains during the announcement period are larger for mergers which are successful. Even after controlling for the time period in which the bid occurred, bidder returns remain positive and significant
Berkovitch and Narayanan (1993)	Synergy Agency Hubris	330 tender offers in 1963-1988, acquirer and target are both publicly quoted at AMEX or NYSE	Distinction of Synergy, Agency, and Hubris hypotheses by looking at the correlation between target and total gains. It is argued that this correlation should be positive if synergy is the motive, negative if agency is the motive, and zero if hubris is the motive	Method: Correlation analysis Correlation among target stock excess returns and combined stock excess returns (when positive and negative), in case of single and multiple bids	The empirical results show that synergy is the primary motive in takeovers with positive total gains even though the evidence is consistent with the simultaneous existence of hubris in this sample. It is also found that agency is the primary motive in takeovers with negative total gains

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Bhagat et al. (2005)	Synergy	1,018 tender offers in 1962-2001 in which the bidder and target were both listed on the NYSE, Amex or Nasdaq	Estimation of takeover value improvements making use of the probability scaling method, which rescales announcement date returns, and the intervention method, which uses returns at intervening events	Method : Regression analysis Dependent variables : Combined stock excess returns, target stock excess returns, and acquirer stock excess returns Explanatory variables: Hostile, cash, stock, industry, size & Tobin's q, legislative influences	Findings show improvements are larger than traditional methods indicate. The hypothesis that bidders on average pay fair prices cannot be rejected. Combined bidder-target stock returns are higher for hostile offers, lower for equity offers, and lower for diversifying offers. These effects reflect revelation about bidder stand-alone value, not differences in gains from combination
Bradley et al. (1988)	Synergy Other	236 successful tender offer contests occurring over the period 1963-1984, acquirer as well as target are US listed on NYSE or AMEX	Estimation of synergistic gains factors that determine the division of these gains between the stockholders of the two firms and document how the division and the total gains created have changed with the changing environment of the tender offer process	Method: Regression analysis Dependent variables: Target stock excess returns, acquirer stock excess returns, and combined stock excess returns Explanatory variables: Time period of offer, multiple bidder, fraction of target shares purchased	Successful tender offers increase the combined value of the target and acquiring firms, competition among bidding firms increases the returns to targets and decreases the returns to acquirers, supply of target shares is positively sloped, changes in the legal/institutional environment of tender offers have had no impact on the total (percentage) synergistic gains created but have significantly affected their division between the stockholders of the target and acquiring firms

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Datta et al. (2001)	Agency	1,719 acquisitions made by 771 US firms in 1993-1998, of which 1,577 mergers, 142 tender offers, stock prices bidder available on CRSP	Examination of how equity-based compensation structure determines corporate acquisition decisions	Method: Regression analysis Dependent variables: Acquirer stock excess returns, long run buy and hold stock excess returns Explanatory variables: Size, payment, managerial stock options, ownership, year, tender offer and industry	A strong positive relationship between equity-based compensation received by acquirer management and stock price response around and following corporate acquisition announcements is found. Conclusion: Executive stock option grants provide effective and strong motivation for managers to make value maximizing investment decisions
Dong et al. (2006)	Agency Misvaluation	Merger bids and tender offers in which both the acquirer and target were listed on NYSE, AMEX, or NASDAQ during 1978-2000	Test of two alternative theories of takeovers, one based upon stock market misvaluation, and the other based upon extensions of the <i>Q</i> -theory of investment	Method 1: Logistic regression analysis Dependent variables: Cash payment, stock payment, hostility, tender, and success Method 2: Regression analysis Dependent variables: Target stock excess returns, acquirer stock excess returns, bid premium Explanatory variables in both methods: Price-to-book & price-to-value ratios, leverage, relative size, target size, industry	The evidence is broadly consistent with both the misvaluation hypothesis and the <i>q</i> hypothesis, although the results do not show higher bidder stock returns by well-managed (high Tobin's <i>q</i>) bidders as expected by the Tobin's <i>q</i> hypothesis. Evidence for the <i>q</i> hypothesis seems to be stronger in the pre-1990 period, whereas evidence for the misvaluation hypothesis is stronger in the 1990-2000 period

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Doukas and Petmezas (2007)	Hubris	Private acquisitions (both foreign and UK) in 1980-2004 by UK public acquirers, consisting of 3,844 and 1,490 acquisitions undertaken by single and multiple acquirers respectively	Examination whether acquisitions by overconfident managers generate superior stock excess returns and whether managerial overconfidence stems from self-attribution	Method: Regression analysis Dependent variable: Acquirer's stock excess return Explanatory variables: Number of acquisitions per period per acquirer, first deal, insider ownership, cash deal, common stock deal, industry, domestic deal, cash flow acquirer, debt capacity acquirer, capital expenditure acquirer, acquirer size, relative size, tobin's q acquirer, time period	Results indicate that managers tend to credit the initial success to their own ability and therefore become overconfident and engage in more deals
Gupta and Misra (2007)	Synergy Agency Hubris	503 merger bids by banks in 1981-2004, both acquirer and target are publicly traded, acquirer is traded at US stock market	Examination of two questions: Do mergers with larger target-to-acquirer size create more value? Do larger bid premiums represent a source of wealth transfer from acquiring to target firm shareholders or do they signal greater expected merger gains?	Method: Regression analysis Dependent variables: Combined stock excess returns, acquirer stock excess returns, target stock excess returns, and long run buy and hold stock excess returns Explanatory variables: Relative size, acquirer's size, bid premium, location, stock payment, legislative effects	Relations among aggregate merger gains, deal size, and bid premiums are asymmetric across value-enhancing versus value-reducing transactions

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Han et al. (1998)	Overpayment (agency, hubris) Misvaluation	253 tender offers and mergers by US firms quoted at AMEX or NYSE in 1974-1987	Examination of the effects of overpayment and the method of payment on bidder returns at the announcement of mergers and tender offers	Method: Regression analysis Dependent variables: Acquirer's stock excess return Explanatory variables: Tender offer, multiple bidders, relative size, cash payment, stock payment, earnings to price ratio and market to book value	The study finds a significantly positive relation between the ratios (<i>industry-adjusted earnings-price ratios</i> and <i>industry-adjusted book-to-market ratios</i>) and bidder returns, supporting the view that bidders tend to overpay to complete acquisitions. In addition, the information effect of the method of payment is empirically supported
Harford (1999)	Agency	23,686 acquisition attempts involving exchange listed US targets in 1977-1993	Determination whether the presence of excess cash leads managers with discretion to make value-decreasing investment decisions	Method: Regression analysis Dependent variables: Acquirer's stock excess return Explanatory variables: Cash position relative to industry, market to book, cash payment, leverage, unexpected bid	Cash rich firms are more likely than other firms to attempt acquisitions. Stock return evidence shows that acquisitions by cash-rich companies are value-decreasing. Cash-rich companies are more likely to make diversifying acquisitions and their targets are less likely to attract other bidders. Overall, the evidence supports the agency costs of free cash flow explanation for acquisitions by cash-rich firms

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Huang and Walkling (1987)	Other	244 CRSP listed targets, acquisitions are front-page announced between April 1977 and September 1982	Test of three hypotheses about target firm announcement returns, namely that stock excess returns will be higher (1) in tender offers than in mergers; (2) in cash offers than in stock offers; (3) in resisted offers than in unresisted offers	<p>Method: Regression analysis</p> <p>Dependent variable: Target's stock excess returns</p> <p>Explanatory variables: Tender offer, undisclosed acquisition, cash payment, mixed payment, undisclosed payment, hostile reaction target management, undisclosed reaction target management</p>	<p>Tender offers yield significantly higher returns than mergers. Tender offers, however, are generally for cash and are more likely to be resisted than mergers. After controlling for form of payment and degree of resistance, no significant difference remains between merger and tender offer. Resisted offers earn statistically insignificant higher returns than unresisted offers. Cash offers are associated with significantly and substantially higher returns both before and after controlling for type of acquisition and degree of resistance</p>
Ismail and Davidson (2007)	Synergy Other	76 targets and acquirers that merged between January 1987 and November 1999, acquirers are publicly listed financial institutions in the EU, Switzerland or Norway, targets are publicly listed	Examination of factors that influence announcement period stock excess returns for target banks in European bank mergers	<p>Method: Regression analysis</p> <p>Dependent variable: Target's stock excess return</p> <p>Explanatory variables: Industry, domestic, merger or acquisition, cash payment, mixed payment, profitability & profit growth, capitalization (both target and relative), loan quality, asset growth, relative size, deposit utilisation, and efficiency</p>	<p>Findings show that European cross-border acquisitions tend to generate higher returns than national acquisitions. Cash deals and deals that are settled by a mix of cash, equity and loan notes create higher returns than equity transactions. It is also found that the target profitability and the relative asset growth rate have significant positive relation with the stock return. In addition, the significance of loan quality, the relative cost to income ratio and the ratio of loans to deposits all point to the importance of efficiency in the European financial services industry</p>

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Jarrell and Poulsen (1989)	Other	770 successful tender offers (526 exchange-listed targets and 462 exchange-listed acquirers) in 1963-1986; target or bidder are listed on NYSE or ASE	Examination of characteristics of tender offer bids that may determine the returns earned by the shareholders of acquiring firms	Method: Regression analysis Dependent variables: Acquirer stock excess returns, target stock excess returns Explanatory variables: Relative size, contested offer, time period	The evidence suggests that the relative size of the target to the acquiring firm plays a large role in determining returns to acquirers. In addition, increased competition for the target significantly lowers returns to the acquiring firm's shareholders
Lang et al. (1989)	Agency	105 targets, 106 bidders, of which 87 matched target bidder pairs, stock returns available in CRSP, all are tender offers in 1968-1986	Test of the q-hypothesis: examination of relationship between bidder stock excess returns, target stock excess returns, and total returns on the one hand and bidder's and target Tobin's q on the other hand	Method: Regression analysis Dependent variables: Acquirer stock excess returns, target stock excess returns, combined stock excess returns Explanatory variables : Acquirer Tobin's q, target Tobin's q, opposed offer	Results are consistent with the view that takeovers of poorly-managed targets by well-managed bidders have higher bidder, target, and total gains. In the sample of successful tender offers, the typical bidder has been a low q firm over several years before the acquisition attempt. The typical target's q ratio has recently declined. The shareholders of high q bidders earn significant stock excess returns in successful tender offers while the shareholders of low q bidders lose.

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Lang et al. (1991)	Agency	101 tender offers in 1968-1986, stock returns quoted at CRSP	Test of the free cash flow hypothesis, which posits that cash flow increases the agency costs of firms with poor investment opportunities	<p>Method: Regression analysis</p> <p>Dependent variable: Acquirer stock excess returns, target stock excess returns, combined stock excess returns</p> <p>Explanatory variables: Acquirer's cash flow, book value acquirer's total assets, acquirer Tobin's q, target Tobin's q, managerial ownership, acquirer's leverage, cash payment, relative size, acquirer's cash position, number of bidders, and whether opposed</p>	The relation between cash flow and bidder returns differs significantly for low q and high q bidders: bidder returns are significantly negatively related to cash flow for low q bidders but not for high q bidders
Malmendier and Tate (2005)	Hubris	477 large publicly traded U.S. firms. To be included in the sample, a firm must appear at least four times on one of the lists of the largest U.S. companies compiled by Forbes magazine in the period from 1984 to 1994	Test hypothesis that the investment of overconfident CEOs is more sensitive to cash flow than the investment of CEOs who are not overconfident and whether the investment-cash flow sensitivity of overconfident CEOs is more pronounced in equity-dependent firms	<p>Method: Regression analysis</p> <p>Dependent variable: Capital expenditures</p> <p>Explanatory variables: Cash flow, Tobin's q, managerial ownership, managerial vested options, size, quality of corporate governance, overconfidence measure (not exercised 67 percent in the money options with lifetime>5 years), all these characteristics are of the acquirer</p>	<p>Findings show that investment of overconfident CEOs is significantly more responsive to cash flow, particularly in equity-dependent firm (Dependent variable: investment)</p> <p>Overconfident managers overestimate the returns to their investment projects and view external funds as unduly costly. Thus, they overinvest when they have abundant internal funds, but curtail investment when they require external financing</p>

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Maloney et al. (1993)	Agency	428 mergers between NYSE firms in 1962-1982, 389 acquisitions of all types between ASE and NYSE firms in 1982-1986, and 173 acquisitions in 1978-1990 for companies with major increases in leverages	Exploration of the argument that leverage enhances decision-making	Method: Weighted regression analysis Dependent variable: Acquirer's stock excess return xplanatory variables: Acquirer's leverage, method of payment, time period, insider ownership	Documentation of a positive relation between the price reaction to the acquiring firm at project announcement and its preannouncement leverage position
Moeller et al. (2005)	Agency	12,023 US mergers and acquisitions in 1980-2001, focus on 4,136 mergers and acquisitions in 1998-2001	Test of hypothesis advanced by Jensen (2003) that high valuations increase managerial discretion, making it possible for managers to make poor acquisitions when they have run out of good ones	Method: Regression analysis Dependent variable: Acquirer's stock excess return Explanatory variables: Acquirer's leverage, acquirer's market-to-book ratio, acquirer Tobin's q, private or public target, industry, tender offer, hostile deal, competed deal, method of payment, bid premium, acquirer's liquidity ratio, acquirer's rel. operating cash flow, acquirer's size relative to stock market	The 1998 to 2001 aggregate dollar loss of acquiring-firm shareholders is so large because of a small number of acquisitions with negative synergy gains by firms with extremely high valuations. The firms that make the large loss deals have indeed high Tobin's q's and low book-to-market (BM) ratios among all firms making acquisitions. The evidence is therefore consistent with the hypothesis. Furthermore, no hubris can be found: there is no redistribution of wealth of large loss bidders to targets

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Morck et al. (1990)	Agency	326 US acquisitions between 1975 and 1987, stock returns quoted at CRSP	Examination of which acquisitions are bad investments for bidding shareholders and of whether those acquisitions appear to provide private benefits to bidding managers. Focus on two aspects of acquisition strategies that can be readily understood in terms of managerial objectives: buying growth and diversification. Examination of the relationship between bidders' past performance and their returns from acquisitions	<p>Method: Regression analysis</p> <p>Dependent variable: Acquirer's stock excess return</p> <p>Explanatory variables: Quality of bidder management (rel. income growth or rel. equity return), method of payment, industry, time period, relatedness of target- and acquirer stock returns, number of bidders</p>	Three types of acquisitions have systematically lower and predominantly negative announcement period returns to bidding firms. The returns to bidding shareholders are lower when their firm diversifies, when it buys a rapidly growing target, and when its managers performed poorly before the acquisition. These results suggest that managerial objectives may drive acquisitions that reduce bidding firms' values
Servaes (1991)	Agency	704 tender offers and mergers in 1972-1987, consisting of 384 bidders and 704 targets, stock returns available in CRSP	Analysis of the relation between takeover gains and the q ratios of targets and bidders	<p>Method: Regression analysis</p> <p>Dependent variables: Acquirer stock excess returns, target stock excess returns, combined stock excess returns</p> <p>Explanatory variables: Tobin's q acquirer, Tobin's q target, relative size, method of payment, competed deal, hostile deal</p>	<p>Target, bidder, and total returns are larger when targets have low q ratios and bidders have high q ratios. The relation is strengthened after controlling for the characteristics of the offer and the contest. This evidence confirms the results of the work by Lang et al. (1989) and shows that their findings also hold for mergers and after controlling for other determinants of takeover gains</p>

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Slusky and Caves (1991)	Synergy Agency Other	100 mergers between publicly held corporations that were completed within the years 1986-1988, <i>(except for two-tier tender offers)</i> , payment for the target exceeding \$ 50 million, <i>targets sector outside of the banking and savings and loan sectors</i> . Both the target and acquiring companies had to be incorporated and based in the United States, and the acquiring corporation could not own more than 25 percent of the target's stock before the acquisition announcement was made	Test of two hypotheses about the creation of value by mergers on premia paid in a sample of 100 recent acquisitions: Hypothesis 1: the value creation can be ascribed to synergies in the coordination of business assets; Hypothesis 2: the value creation can be attributed as gains from shifting control of assets into the hands of more effective managers	Method: Regression analysis Dependent variables: Bid premium, change of acquirer value divided by market value target before acquisition Explanatory variables: Industry, leverage differences target and acquirer, managerial ownership of acquirer and target, block-holders acquirer and target, S&P index closing day transaction, method of payment, competed deal	The premia increase with financial although not with real synergies and with the scope for 'managerial' behavior in the target firms. The acquirers' willingness to pay also increases with their scope for managerial behavior. The presence of either actual or potential rival bidders has a powerful effect, and it is ascertained that market gains (losses) to acquirers' shareholders do not distort the associations between acquisition premia and sources of value

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Smith and Kim (1994):	Agency Misvaluation	177 inter-firm tender offers in 1980-1986	Test of two hypothesis: The financial slack hypothesis due to which bids combining slack-poor firms and firms with free cash flow should resolve informational asymmetry, so that underinvestment is avoided; The free cash flow hypothesis according to which these bids should also limit the discretion of managers, so that overinvestment is avoided	Method: Regression analysis Dependent variable: Acquirer's stock excess return Explanatory variables: Successful bid, leverage acquirer, investment ratio acquirer, managerial ownership acquirer, method of payment, profitability target, industry, number of bidders, classification of target by free cash flow and slack, acquirer's beta	Results are consistent with implications of the slack and free-cash-flow hypotheses
Song and Walking (1993)	Other	459 firms, consisting of 153 targets, 153 industry-matched non-targets, and 153 randomly selected non-targets; all publicly quoted. Targets relate to all acquisition-related announcements initially appearing on the front page of the <i>Wall Street Journal</i> over the period April 1977 through December 1986, whether successfully acquired or not	Examination of the relationship between managerial ownership and the probability of being a target firm, and of the impact of managerial ownership on target shareholder returns	Method: Logistic regression analyses Dependent variables: I: Probability of acquisition attempt II: Target's stock excess return Explanatory variables: Ad I: Managerial ownership, size, leverage, liquidity, growth, profitability, valuation ratio, price earnings ratio, institutional holdings, all of target, and hostile deal. Ad II: Hostile deal, successful deal, target's managerial ownership	Targets have lower managerial ownership than either their industry counterparts or randomly selected non-targets. Managerial ownership is significantly lower in contested compared to uncontested offers, and in unsuccessful compared to successful cases. Managerial ownership is significantly related to stock excess returns in contested cases that are ultimately successful. The results are consistent with a positive impact of managerial ownership where it is used to negotiate, but not ultimately block, an acquisition

Authors	Acquisition theories examined	Sample	Focus of the study	Method and variables	Outcome of the study
Sung (1993)	Misvaluation	222 takeovers in 1974-1987, of which the acquiring firms are listed on NYSE or AMEX	Determination of the version of the information-related hypotheses that explains the financing choice of takeover activities best: the pecking order hypothesis or the signalling hypothesis	Method: I: Regression analysis II: Bivariate probit analyses Dependent variable: Ad I: Acquirer's stock excess return Ad II: Probability of acquisition attempt Explanatory variable: Ad I: Tender offer, number of bidders, relative size, method of payment, bid premium Ad II: Three different cash flow measures	In the 1980s, <i>ceteris paribus</i> , cash offers were likely to be chosen by relatively cash-rich firms, whereas stock exchange offers were likely to be chosen by normal cash-generating firms relative to their industry. The evidence is consistent with the pecking order hypothesis, but not with the signalling hypothesis
Travlos (1987)	Misvaluation	167 acquiring firms in 1972-1981: 60 common stock exchange offers, 100 cash offers, and seven combinations of common stock and cash; 126 merger proposals and 41 tender offers	Exploration of the role of the method of payment in explaining common stock returns of bidding firms at the announcement of takeover bids	Method: regression analysis Dependent variable: Acquirer's stock excess return Explanatory variables: Method of payment, bid premium, relative size, tender offer, merger	Bidding firms suffer significant losses in pure stock exchange acquisitions, but they experience 'normal' returns in cash offers. These results hold true for both types of acquisitions, mergers and tender offers. These findings are attributed mainly to signalling effects

4 | Data

4.1 INTRODUCTION

Preceding the research into goodwill, a thorough data collection was carried out. Data were collected from existing databases, but also manually by carefully going through the notes to the financial statements in the annual reports of the acquiring company. In addition, time series calculations were performed to derive the required data on stock excess returns. In this chapter the sources of the data are specified and the composition of the sample selection is explained. Here hypothesis 1, stating that new regulation results in more frequent reporting on purchased goodwill, is tested. Next, the data used in the research are described and their calculations are further clarified. In the appendix with this chapter, background information can be found regarding the calculations of the excess returns as well as the estimation of their significance.

4.2 DATA

This section further specifies the sources of the data and the sample selection. First, data on mergers and acquisitions are discussed. Then, data on goodwill amounts, mentions and amounts of intangible assets, and purchase prices are reviewed. Finally, light will be thrown on the data on stock returns and other variables.

4.2.1 Data on mergers and acquisitions

The initial sample of mergers and acquisitions was compiled from the Securities Data Company's (SDC Platinum) database. Mergers and acquisitions selected were between US publicly quoted companies to which US GAAP apply, with announcement dates as well as effective dates between

January 1997 and December 2000 (time period 1997-2000), and January 2002 and December 2005 (time period 2002-2005) respectively.

The first group represents mergers and acquisitions that took place during the period when APB Opinions no. 16 and APB Opinion no. 17 were in force, whereas the second group concerns mergers and acquisitions after SFAS 141 and SFAS 142 were adopted. Mergers and acquisitions in 2001 were left aside, as 2001 is a transitional year.

When selecting the observations, it was further required that the form of the deal was an acquisition, an acquisition of assets, or a merger. Mergers and acquisitions in which acquirer, target or both are financial companies (1-digit SIC code 6) were removed because of dissimilarities in regulation in the financial industry when compared to the other industries.

Based on these requirements, the SDC Platinum database initially provided a sample with 1,446 mergers and acquisitions.

The SDC Platinum database provides information about the accounting method for the acquisition. Mergers and acquisitions that were accounted for by the pooling of interests method were excluded (327 observations), because acquiring companies applying this method do not record purchased goodwill. Further, mergers and acquisitions with unknown acquisition techniques (161 observations) were precluded, as in a pilot study it emerged that of these observations only a very small number of acquiring companies actually mentioned purchased goodwill. These removed observations (488 observations in total) all regarded observation in the time period 1997-2000, as the new regime requires all mergers and acquisitions to be accounted for by the purchase method. Only mergers and acquisitions in which 100 percent of the shares were acquired were considered, resulting in a drop of another 32 observations. Finally, 23 observations dropped for other reasons, mainly because the acquiring company reported the aggregate number of several acquisitions simultaneously. The resulting sample consists of 903 observations on mergers and acquisitions, 514 of which are in the time period 1997-2000 and 389 in the time period 2002-2005. Table 4-1 summarizes the composition of the sample on mergers and acquisitions.

Table 4-1: Composition of sample on mergers and acquisitions from SDC Platinum

	1997-2000	2002-2005	1997-2005*
Number of observations from SDC Platinum	1047	399	1446
Removed observations			
• Pooling of interests	327		327
• Unknown acquisition technique	161		161
• Percentage of shares acquired <100	23	9	32
• Inconsistent data	22	1	23
Number of observations selected	514	389	903

Source: SDC-Platinum.

* Observations on mergers and acquisitions in 2001 were left aside, as regarding the accounting changes in reporting on business combinations 2001 is a transitional year.

4.2.2 Data on goodwill amounts, intangible assets, and purchase prices

Information about purchased goodwill amounts, acquired intangible assets numbers, and purchase prices were derived by accurately analyzing the notes to the financial statements in the acquiring companies' 10-K form annual reports. These annual reports are available with the Securities and Exchange Commission's (SEC's) filings and forms (EDGAR filings and forms).

Data on goodwill amounts

Regarding data on goodwill, from 389¹³⁸ out of the 903 observations on mergers and acquisitions no data on goodwill could be found. One observation was removed because it came up with a negative goodwill amount. Five observations were excluded because of the extremely high goodwill amounts that were involved.¹³⁹

Data on intangible assets

Data or missing data on intangible assets were no grounds for removing any observations.

Data on purchase prices

Nine observations were removed because no information was available on either the purchase price or the value of transaction of the acquisition. Moreover, five cases were precluded because of the extremely high amounts of purchase prices and transaction values involved. The definitions of the purchase price and of the value of transaction of the acquisition are further explained in section 4.3, which deals with the descriptives.

Data on relative amounts of goodwill

Another six observations dropped out because they showed extremely high relative amounts of goodwill. These relative amounts were derived by dividing the purchased goodwill amounts by the purchase price or the value of transaction of the acquisition and are further explained in section 4.3.

Table 4-2 illustrates the number of observations that remained after implementing the selection criteria regarding availability of data on goodwill and purchase price or transaction value and after removing outliers. The

138 By coincidence, the number of observations with no goodwill data (389, Table 4-2) is the same as the initial number of selected observations in time period 2002-2005, as it flows from Table 4-1. This is not a typing error.

139 In this research relative goodwill amounts are analyzed, thereby smoothing out the large impact that observations in the top of the distribution of goodwill may have on the results. To preclude any resulting bias of large amounts, as a precautionary measure five observations containing extremely large goodwill amounts are excluded. Following the same reasoning, another 11 observations showing extremely large amounts of purchase prices or values of transaction, were precluded from further research.

search for information on data concerning these amounts eventually yielded 488 observations with usable data on goodwill and purchase price; 222 of these observations were related to the time period 1997-2000, and 266 of them to the time period 2002-2005.

The outcomes of Table 4-2 *provide evidence for hypothesis 1*: New regulation results in more frequent reporting on purchased goodwill. For example, when compared to the time period 1997-2000, in 2002-2005 fewer observations are lost due to missing data on purchased goodwill. In the time period 1997-2000, 46.3 percent of the acquiring companies reported on purchased goodwill compared to 71 percent of the acquiring companies in 2002-2005. This is an increase of 35 percent. This finding is further supported by the outcomes of a Pearson χ^2 test on the differences in reporting frequency on goodwill between the two time periods ($\chi^2 = 54.858$, $p\text{-value} = 0.000$).

Table 4-2: Composition of sample of mergers and acquisitions including goodwill data from 10-K forms EDGAR

	1997-2000	2002-2005	1997-2005*
Number of observations selected from SDC Platinum**	514 100%	389 100%	903 100%
Data on goodwill available in 10-K forms EDGAR	238 46.3%	276 71.0%	514 56.9%
Data on goodwill not available in 10-K forms EDGAR	276 53.7%	113 29.0%	389 43.1%
Data on goodwill available in 10-K forms EDGAR	238	276	514
Outliers			
• Negative goodwill amounts	0	1	1
• Extremely high goodwill amounts (>\$15 billion)	2	3	5
Relative goodwill amounts			
Data on purchase price or value of transaction not available	8	1	9
Outliers			
• Extremely high purchase prices (>\$20 billion) or values of transaction (>\$15 billion)	3	2	5
• Extremely high relative goodwill amounts (>200% of purchase price or >300% of value of transaction)	3	3	6
Number of observations selected	222	266	488

Source: SDC-Platinum, 10-K forms acquiring companies with Edgar database (SEC).

* Observations on mergers and acquisitions in 2001 were left aside, as regarding the accounting changes in reporting on business combinations, 2001 is a transitional year.

** Testing for the difference in reporting on goodwill in both periods shows a significant difference ($\chi^2=54.858$, $p\text{-value}=0.000$).

4.2.3 Data on stock returns and other variables

In chapter 5, the full sample of 488 observations of the time period 1997-2005¹⁴⁰ will be used to compare purchased goodwill amounts and intangibles figures before and after SFAS 141 and SFAS 142 coming into force, and to analyze the impact of the new regime on the relative amounts of reported purchased goodwill. The research of chapter 6 is confined to the 266 observations of the time period 2002-2005 as input for in-depth research into the information content of goodwill: it concerns research into the information content of goodwill under the new regime, in which it will be examined whether goodwill can be explained from value creation.

Regarding the time period 2002-2005, more information on acquirer and target was required to carry out effectively the in-depth research in chapter 6. This information was partly derived from the Compustat North America database. This database provides information on financial data from the annual reports of the companies and on managerial ownership. From the Compustat North America database, information was obtained up to one year preceding the fiscal year in which the acquisition had been realized. Another provider of data for the in-depth research was the Center for Research in Security Prices (CRSP). CRSP reports on daily stock prices and stock returns. To gather the information that is required to calculate stock excess returns, listings were needed of acquirer and target on this database for 205 days before the announcement date and ten days after it. Table 4-3 lists the number of observations available for testing when these additional requirements were fulfilled.

Table 4-3: Number of observations available from CRSP and Compustat

Number of observations time period 2002-2005		
Combined with data about goodwill and purchase price from 10-K forms in EDGAR	266	
Combined with acquirer data available in CRSP	251	
Combined with target data available in CRSP	214	
Combined with both acquirer and target data available in CRSP	207	
Combined with Compustat data on acquirer and target	Max 239	Min 108

It turned out that of the 266 observations of mergers and acquisitions with data on goodwill and purchase price, 251 cases provided information about acquirer stock returns, 214 cases informed on target stock returns, and 207 cases reported on both acquirer and target stock returns in CRSP. Further, 239 observations also supply information from Compustat for both acquirer and target. Compustat information is not equally extensive for all cases.

¹⁴⁰ Apart from acquisitions announced and effective in 2001, as regarding the accounting changes in reporting on business combinations 2001 is a transitional year.

When performing multivariate regressions, this further lowers the number of observations to a minimum of 108.¹⁴¹

To preclude the loss of observations in multivariate regressions in addition to the regressions with a lower number of observations, regressions will also be performed with all available observations, thereby correcting for missing data by means of dummy variables.

4.3 DATA DESCRIPTIVES

This section concerns data descriptives: it further explains the variables used for research. First, the relevant variables of the full sample of 488 observations of the time period 1997-2005 will be described. Second, attention will be paid to the descriptives of the extra variables to be used for the in-depth research of the observations of the period 2002-2005.

4.3.1 Data descriptives full sample

Table 4-4 presents the descriptives of the full sample of 488 observations. First, the dependent variables will be discussed. This will be followed by a discussion of the explanatory variables.

Table 4-4: Descriptives full sample

Variable	N	Freq.	Mean	Std. Dev.	Min.	Max.
Dependent variables						
Goodwill*	488		602,821	1,312,062	57	12,343,000
Purchase price*	488		923,687	1,798,331	2,074	15,517,000
Value of transaction*	488		960,730	1,869,600	2,278	14,732,640
Relative goodwill 1 (divided by purchase price)	488		0.619	0.306	0.009	1.986
Relative goodwill 2 (divided by value of transaction)	488		0.634	0.362	0.007	2.346
Explanatory variables						
Classification of industry target into <ul style="list-style-type: none">• services• other	488	179 309				
Classification of industry target into <ul style="list-style-type: none">• technology• other	488	223 265				

141 This minimum number of 108 observations can be found in regression 6(a) in Table 6-5 and in regression 6(c) in Table 6-7.

Variable	N	Freq.	Mean	Std. Dev.	Min.	Max.
Acquirer reporting other acquired intangibles • yes • no	488	351 137				
Intangible assets*	349 ¹⁴²		238,815	691,791	300	8,210,000
Intangible assets in more detail						
Intangible assets divided by the purchase price	349		0.286	0.238	0.001	1.265
Intangible assets divided by the value of transaction	349		0.288	0.241	0.001	1.306
In Process Research & Development (IPRD)*	149		81,314	173,209	100	945,000
IPRD divided by purchase price	149		0.141	0.203	0.000	0.898
IPRD divided by value of transaction	149		0.144	0.217	0.000	1.152
Workforce*	35		9,805	24,034	40	127,100
Workforce divided by purchase price	35		0.024	0.024	0.000	0.094
Workforce divided by value of transaction	35		0.024	0.028	0.001	0.140

The sample comprises 488 acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001), and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables ranges between 35 and 488 per variable. Two different measures of relative goodwill amounts are used: relative goodwill 1, representing goodwill divided by the purchase price of the acquisition, and relative goodwill 2, defined as goodwill divided by the transaction value of the acquisition. Target companies are classified into services industry and technology industry. Acquiring companies are classified into reporting on purchased intangible assets. Of intangible assets, IPRD and workforce nominal amounts as well as relative amounts (relative to purchase price and value of transaction) are mentioned. Information on mergers and acquisitions and value of transaction is derived from SDC Platinum.

Source: Information on purchased goodwill, purchase price, purchased intangible assets, and SIC-code is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

* Amounts are in \$1,000.

- 142 When considering the extra explanatory variables used for the in-depth research of separate reporting on intangibles in 5.3.4, two more observations were omitted due to inconsistent data in relative intangible amounts mentioned. The observations showed up unrealistically high relative total intangible amounts when compared to the purchase price, probably due to a typing error in the database. This brings the number of observations available for the in-depth analysis of separate reporting of intangibles to 349. The dummy for intangible assets is not affected by the size of relative amounts of intangible items. Therefore, when using the dummy variable for intangibles in 5.3.3 and 5.3.5, the number of observations reporting on intangible assets remains 351.

4.3.1.1 Descriptives of dependent variables: goodwill and the acquisition price

In this section, the dependent variables will be discussed. For this, goodwill and the price paid for the acquisition will be reviewed. Further, it is explained why two different measures of relative goodwill are used in this research.

Goodwill

The dependent variables are the focus of the research. Data on goodwill and purchase price were derived by own research work on the notes to the financial statements in the 10-K forms of the acquiring companies with EDGAR filings and forms. Thus collected data are unique in their kind, as in conventional databases no information is available on purchased goodwill amounts. Two different measures of relative goodwill were determined. The first measure of relative goodwill (relative goodwill 1) was derived by dividing the amount of purchased goodwill by the purchase price of the acquisition, and the second measure of relative goodwill (relative goodwill 2) by dividing the amount of purchased goodwill by the value of transaction of the acquisition. Table 4-4 displays an average amount of purchased goodwill of \$603 million. It further shows that goodwill amounts to 62 percent of the purchase price of the acquisition of \$924 million (relative goodwill 1), and 63 percent of the value of transaction of the acquisition of about \$961 million (relative goodwill 2).

Purchase price

As shown by the explanation of the two different relative amounts of goodwill, two different approaches for the money involved in the acquisition were used. One measure used was the purchase price, which is calculated in the following order:

$$\text{Purchase price} = \text{assets acquired (including purchased goodwill)} - \text{liabilities assumed} + \text{restructuring costs}^{143}$$

The purchase price is a relevant measure for calculating relative goodwill amounts because in the notes to the financial statements, acquiring companies present purchased goodwill amounts and purchase prices together, thereby using the same accounting techniques, which may make these concepts match nicely. Therefore, the strength of the purchase price is that it is, like goodwill, a financial accounting item presented in the annual report. Nevertheless, during the searching for goodwill and purchase price, differences between companies were observed in their estimation of the purchase price. For instance, some of

143 Here the costs of restructuring resulting from the acquisition are mentioned. These costs are (together with the assets acquired, liabilities assumed, and purchased goodwill) reported in the notes to the financial statements in the 10-K forms of the acquiring company.

the acquiring companies take restructuring costs into consideration in determining the purchase price, while other companies omit these costs. The study tries wherever possible to keep a constant line and to recalculate purchase prices according to one format.

Value of transaction

In order to be certain that the research is well-founded and reliable, in addition to purchase price a second measure of the acquisition price was also used: the value of transaction. The value of transaction had been obtained from SDC Platinum. In SDC Platinum the value of transaction is described as the total value of consideration paid by the acquirer in dollars, excluding fees and expenses, and including liabilities assumed. "The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Liabilities assumed are included in the value if they are publicly disclosed. Preferred stock is only included if it is being acquired as part of a 100 percent acquisition. If a portion of the consideration paid by the acquirer is common stock, the stock is valued using the closing price on the last full trading day prior to the announcement of the terms of the stock swap. If the exchange ratio of shares offered changes, the stock is valued based on its closing price on the last full trading date prior to the date of the exchange ratio change. For public target 100 percent acquisitions, the number of shares at date of announcement is used."¹⁴⁴

Finance and accounting perspective

Using these two different measures – purchase price and value of transaction, the price paid for the acquisition is considered from two different points of view: from the *financial accounting perspective* (purchase price) and from *finance perspective* (value of transaction).

As relative goodwill 1 and relative goodwill 2 were calculated based on these two values, both approaches will be examined in this research.

Scatter diagrams

Figure 4-I represents four different scatter diagrams corresponding to absolute and relative goodwill amounts. They are about scatters of goodwill with purchase price (4-I a), relative goodwill 1 with purchase price (4-I b), goodwill with value of transaction (4-I c), and relative goodwill 2 with value of transaction (4-I d), respectively. The scatter diagrams show balanced distribution of the variables, indicating that no more outliers are there and that the sample forms a solid basis for further research.

As expected, scatter diagram 4-I a shows a positive relationship between goodwill and purchase price. Scatter diagram 4-1 b shows the relationship between goodwill as a percentage of purchase price and the purchase price.

144 Source: variables list SDC Platinum.

Although goodwill increases with purchase price, goodwill as a percentage of purchase price is not constant (relative goodwill 1). Scatter diagrams 4-1 c and 4-1 d show the same information for the relationship between goodwill and the value of transaction. Also, goodwill as a percentage of value of transaction shows variation (relative goodwill 2). This variation gives rise to further research into the contents of goodwill.

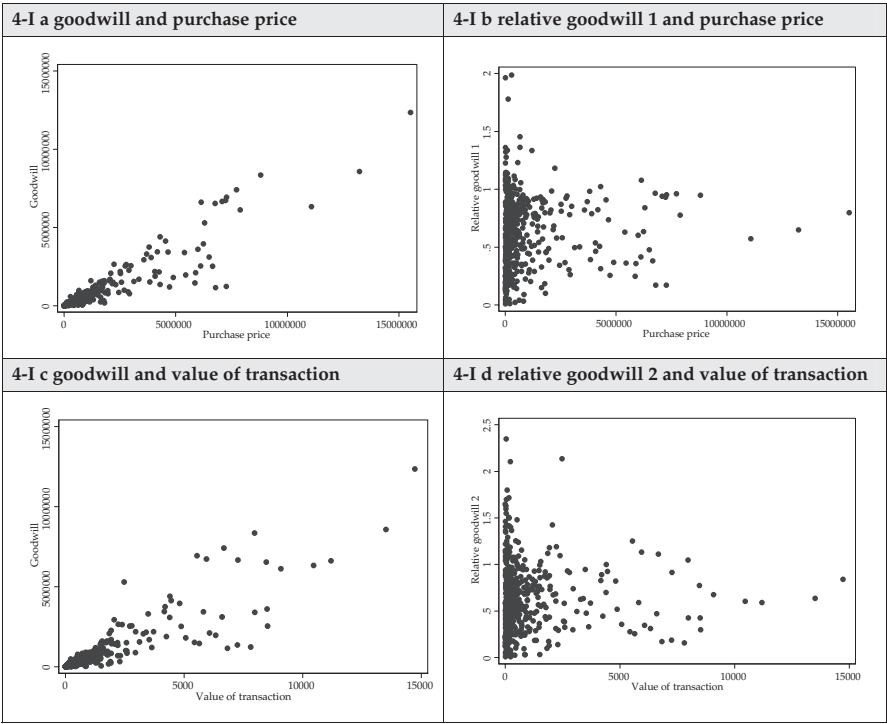


Figure 4-I: Scatter diagrams of goodwill and relative goodwill amounts on purchase price and value of transaction

Figure 4-I presents four different scatter diagrams corresponding to absolute and relative goodwill amounts of 488 acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). Figure 4-I a shows a scatter diagram of goodwill with purchase price. Figure 4-I b is a scatter diagram of relative goodwill 1 with the purchase price. Figure 4-I c and Figure 4-I d show scatter diagrams of goodwill with the value of transaction and relative goodwill 2 with the value of transaction respectively.

Source: Information on mergers and acquisitions and value of transaction is derived from SDC Platinum. Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Amounts are in \$1,000.

When analyzing goodwill, size does matter. Taking into account the size of the acquisition can be done in two different ways. The first method is to include the purchase price or the value of transaction in the explanation of the amount of goodwill. The purchase price or the value of transaction are then added as explanatory variables, whereas goodwill is the dependent variable. Another method is to analyze the amount of goodwill related to the

purchase price or the value of transaction (relative goodwill 1 or 2), instead of the absolute amount of goodwill. In this research the latter method is chosen.

Analyzing relative goodwill amounts instead of absolute goodwill amounts smoothes out another problem. As the amount of purchased goodwill in acquisitions can be quite large, observations in the top of the distribution of goodwill can have a large impact on the results. One way of dealing with this phenomenon is to calculate the logarithm of goodwill. However, as relative goodwill amounts are analyzed, taking the logarithm of these ratios might not add much to the specification of the model.¹⁴⁵

4.3.1.2 Descriptives of the explanatory variables: industries and intangibles

In this section, the relevant explanatory variables of the full sample of 488 observations of time period 1997-2005 will be described. First, the classification of the target industries into services and into technology will be discussed. Then, information on the intangible assets will be provided.

Target's industry

One of the explanatory variables for purchased goodwill is the industry the target is in. Table 4-4 shows the data of two different classifications used in this research to control for the effect of industry on purchased goodwill: a classification of the industry of the target (1) into services and (2) into technology respectively. The targets were classified using their Standard Industrial Classification (SIC) codes available from SDC Platinum, and utilizing information about this classification from the 'Standard Industrial Classification (SIC) Search' and 'American Electronics Association's (AeA's) High-Tech Industry Definition'.¹⁴⁶ It turns out that 37 percent of the targets are from services industries, and 46 percent from technology industries.¹⁴⁷

Intangible assets

Another explanatory variable is the availability of information on other purchased intangibles. Like the information of goodwill and purchase price, this information was derived by accurately analyzing the notes to the financial statements of the acquiring company, available with EDGAR's filings and forms. From Table 4-4 it turns out that in 351 cases of the 488

145 To preclude any biased effects on the results of the research due to not taking into account logarithms of goodwill, in chapter 5 and 6 alongside the results of OLS regressions analyzing relative goodwill amounts, the results of logistic regressions analyzing $\ln(\text{relative goodwill})$ will be described briefly. Results show that the outcomes of the logistic regressions are in line with the results of the OLS regressions analyzing relative goodwill amounts. More extended results of these regressions are available on request.

146 American Electronics Association, AeA's High-Tech Industry Definition, www.aeanet.org.

147 Consequently, 63% of the targets are from no-services industries, and 54% from other than technology industries.

observations mentioning goodwill, information about other acquired intangibles is also provided (72 percent). The amount of intangible assets averages \$ 239 million. Expressed as percentages of the purchase price and the value of transaction, this amounts to 29 percent for both cases. During the search for the intangible assets figures, two noteworthy items were further considered: in process research and development (IPRD, 149 observations) and workforce (35 observations). The absolute and .relative amounts of IPRD are \$ 81 million and 14 percent. The corresponding workforce amounts are about \$ 10 million and 2 percent respectively.

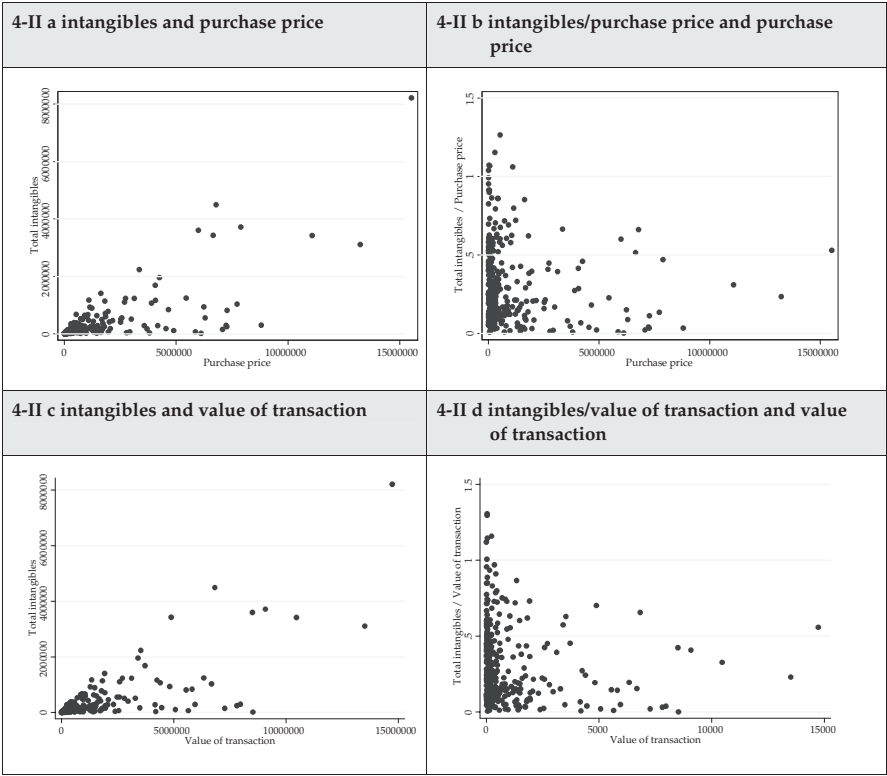


Figure 4-II: Scatter diagrams of intangibles and relative intangibles amounts on purchase price and value of transaction

Figure 4-II presents four different scatter diagrams corresponding to absolute and relative intangibles amounts. The figure relates to 349 acquisitions providing information on intangible assets out of a total of 488 acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). Figure 4-II a shows a scatter diagram of intangibles with purchase price. Figure 4-II b is a scatter diagram of intangibles divided by the purchase price with the purchase price. Figure 4-II c and Figure 4-II d show scatter diagrams of intangibles with the value of transaction, and of intangibles divided by the value of transaction with the value of transaction respectively.

Source: Information on mergers and acquisitions and value of transaction is derived from SDC Platinum. Information on intangibles and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Amounts are in \$1,000.

Figure 4-II shows the relationship between the total intangibles and the purchase price. From scatter diagram 4-II a, it can be concluded that intangibles increase with the purchase price. Scatter diagram 4-II b displays the relationship between goodwill as a percentage of purchase price and the purchase price. Intangibles as a percentage of purchase price show variation (relative goodwill 1). Scatter diagrams 4-II c and 4-II d show the same information for the relationship between intangibles and the value of transaction. The scatters demonstrate that no outliers occur.

4.3.2 Additional data descriptives time period 2002-2005

This section provides information on the variables that were selected for the in-depth research into the acquisitions during the time period 2002-2005 and that can be found in chapter 6. Table 4-5 shows the stock excess returns surrounding the acquisition announcement of the acquiring company, the target company, and the combination of acquiring company and target company. Below, the stock excess returns are further explained.

Table 4-5: Descriptives of the stock excess returns of acquisitions for the time period 2002-2005

Variables	N	Mean	Std.Dev.	Min	Max
Stock excess returns (event window)					
Acquirer stock excess return (0)	251	-0.66%	4.93%	-26.32%	.2080368
Acquirer stock excess return (-1, 1)	251	-1.14%	8.12%	-30.63%	.2621596
Acquirer stock excess return (-2, 2)	251	-1.37%	9.55%	-38.28%	32.49%
Acquirer stock excess return (-3, 3)	251	-1.40%	10.65%	-41.81%	41.40%
Acquirer stock excess return (-5, 5)	251	-1.20%	11.15%	-32.02%	28.07%
Target stock excess return (0)	214	5.13%	14.39%	-32.97%	91.05%
Target stock excess return (-1, 1)	214	16.20%	24.13%	-31.39%	117.74%
Target stock excess return (-2, 2)	214	22.65%	30.09%	-39.38%	237.67%
Target stock excess return (-3, 3)	214	24.96%	31.04%	-47.65%	242.61%
Target stock excess return (-5, 5)	214	26.45%	31.99%	-58.82%	248.56%
Combined stock excess return (0)	207	-0.68%	4.35%	-24.52%	24.58%
Combined stock excess return (-1, 1)	207	1.06%	7.49%	-22.70%	25.05%
Combined stock excess return (-2, 2)	207	1.09%	8.67%	-26.52%	28.50%
Combined stock excess return (-3, 3)	207	1.25%	10.00%	-35.30%	32.08%
Combined stock excess return (-5, 5)	207	1.77%	10.80%	-36.73%	31.39%

Variables	N	Mean	Std.Dev.	Min	Max
Stock excess return amounts (event window)*					
Acquirer stock excess return amount (0)	251	-598	230,694	-1,399,359	2,380,376
Acquirer stock excess return amount (-1, 1)	251	-27,178	442,920	-2,361,068	2,902,515
Acquirer stock excess return amount (-2, 2)	251	-35,881	705,628	-4,841,907	6,212,236
Acquirer stock excess return amount (-3, 3)	251	-92,107	940,006	-6,128,654	4,922,827
Acquirer stock excess return amount (-5, 5)	251	-78,391	987,068	-6,083,558	8,149,828
Target stock excess return amount (0)	214	17,538	87,866	-152,545	870,030
Target stock excess return amount (-1, 1)	214	68,119	181,168	-533,650	1,290,349
Target stock excess return amount (-2, 2)	214	81,855	179,207	-398,968	1,498,527
Target stock excess return amount (-3, 3)	214	92,880	192,388	-695,100	1,079,109
Target stock excess return amount (-5, 5)	214	86,671	195,298	-1,303,203	919,119
Combined stock excess return amount (0)	207	15,521	243,216	-646,834	2,403,052
Combined stock excess return amount (-1, 1)	207	27,113	485,112	-2,894,719	2,924,218
Combined stock excess return amount (-2, 2)	207	28,422	754,926	-4,730,850	6,238,901
Combined stock excess return amount (-3, 3)	207	-25,254	996,894	-5,124,976	5,633,762
Combined stock excess return amount (-5, 5)	207	-16,057	1,086,105	-5,376,946	8,876,613

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 251 cases provided information about acquirer stock returns, 214 cases informed on target stock returns, and 207 cases reported on both acquirer and target stock returns.

Acquirer and target stock excess return amounts are derived by multiplying stock excess returns of the companies by their market capitalizations one day before the start of each event window. Combined stock excess return amounts are calculated by multiplying acquirer and target stock excess returns with their market capitalizations one day before the start of each event window time period.

Acquirer and target stock excess returns are measured using the ordinary least squares (OLS) market model. Stock excess returns are calculated according to OLS market model (parameters estimated over (-205, -6) interval, using equally weighted market index returns. The event windows used to calculate the cumulative excess returns are one-day (0), three-day (-1, +1), five-day (-2, +2), seven-day (-3, +3), and eleven-day (-5, +5) time period, respectively). Combined stock excess returns were calculated by dividing the combined stock excess returns amount by the total market capitalization of acquirer and target one day before the start of each event window time period.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Information on stock returns is provided by CRSP.

* Amounts are in \$1,000.

Stock excess returns

Brown and Warner (1985) give a thorough explanation of how daily stock returns can be used to calculate excess returns. Following Brown and Warner (1985), in this research, stock excess returns were calculated in three ways: mean adjusted returns, market adjusted returns, and the ordinary least squares (OLS) market model. The calculation of the stock excess returns, the statistics used to test their significance, and the results can be found in the appendix with this chapter. It shows that the three different ways of

calculating stock excess returns gave comparable excess returns and were statistically significant different from zero. As the results in the appendix show, the magnitude of the stock excess returns is not sensitive to using either definition of stock excess returns. Therefore, the research is further conducted using only one definition of stock excess returns: the OLS market model. The parameters for the OLS market model are estimated over the (-205, -6) interval, using the CRSP equally weighted market index returns. The event windows used to calculate the cumulative stock excess returns are one-day (0), three-day (-1, +1), five-day (-2, +2), seven-day (-3, +3), and eleven-day (-5, +5) time periods respectively. Combined stock excess returns of acquirer and target were calculated by multiplying their stock excess returns with their market capitalization one day before the start of each event window time period, and by dividing this amount by their total market capitalization one day before the start of each event window time period.¹⁴⁸

Data on acquirer stock excess returns show that acquirers' shareholders were harmed by the acquisition: they lost value due to stock price decreases: their average stock excess return varies, depending on the event window taken into account, between -0.66 percent and -1.4 percent. The negative returns to acquirers' shareholders may indicate that on average acquirers overpaid for an acquisition. Yet, target stock excess returns on average are highly positive: they vary between 5.13 percent for a one-day event window, and 26.45 percent in case of an eleven-day event window. The slightly positive stock excess return of the combinations of acquirers and targets (except for the one day event period, which shows a negative combined stock excess return of 0.65 percent) indicates that on average acquisitions were creating shareholder value.

Regarding target stock excess returns and combined stock excess returns, it further turns out that the event window has an increasing effect on the stock excess returns: the longer the event period, the higher the stock excess returns. Probably more information is incorporated in the stock prices in the case of a longer event period.

In addition, Table 4-5 provides information on the stock excess return amounts of acquirer, target, and the combination of acquirer and target. Stock excess return amounts are derived by multiplying stock excess returns of the companies by their market capitalizations one day before the start of each event window.

Corresponding to the acquirer and target stock excess returns, the excess return amounts are negative for the acquiring companies and positive for the target company. Remarkably, whereas combined stock excess returns on average show positive numbers for the seven-day and eleven-day event windows, the combined stock excess return amounts do not. This indicates that excess returns are lower when the combined size of the acquiring company and the target company are is larger.

148 In other words, one, two, three, four, and six days before the announcement day of the acquisition respectively.

Table 4-6 provides information on the explanatory variables that are used for the in-depth analyses of the acquisitions of time period 2002-2005.

Each explanatory variable was carefully examined. Observations with outliers in the continuous variables were removed. For all categorical variables used in the analyses in chapter 6, each of the distinguished categories occurs in at least 10 percent of the cases. Similar to relative goodwill amounts, most of the variables involved are ratio variables or dummy variables. When compared to level variables, ratio variables suffer less from extreme values of the level variables on which they are composed. Thus, using logarithms of ratio variables in the analyses does not add to their interpretation. Below, these variables are further explained.

Table 4-6: Descriptives of the explanatory variables used in chapter 6: time period 2002-2005

Explanatory variables	N	Freq	Mean	Std.Dev.	Min	Max
Operating synergies						
Relative size	251		41.71%	50,22%	0,62%	278,51%
Same sector (2 digit SIC-code)	265 ¹⁴⁹		0.638	0.482	0	1
• no		96				
• yes		169				
Financial synergies						
Difference debt-assets ratio target and acquirer	192		0.080	0.356	-0,626	2,655
Squared difference debt-assets ratio target and acquirer	192		0.133	0.554	0	7,046
Management improvement						
Acquirer Tobin's q	250		2.180	1.349	0.674	11.199
Target Tobin's q	187		2.045	1.611	0.448	15.505
Dummy acquirer Tobin's q	250		0.504	0.501	0	1
Acquirer – target Tobin's q:	176					
• low – low		56				
• low – high		35				
• high – low		25				
• high – high		60				

149 When considering the extra explanatory variables used for the in-depth research of acquisitions in time period 2002-2005, one more observation was skipped due to inconsistent data in one of these additional variables. The observation showed up a percentage of shares owned by executives as greater than 100 percent. This brings the number of observations available for the in-depth research to 265.

Explanatory variables	N	Freq	Mean	Std.Dev.	Min	Max
Empire-building						
Acquirer debt-assets ratio	253		0.451	0.282	0,043	2,708
Percentage of shares owned by executives acquirer	155		1.80%	4.67%	0,00%	38,41%
Bargaining						
Source of financing	265					
• cash			50.86%	43.67%	0%	100%
• stocks			43.04%	43.58%	0%	100%
• other securities			6.10%	15.02%	0%	81,34%
Tender offer: yes/no	265		0.177	0.383	0	1
• tender offer		48				
• other		221				
Merger: yes/no	265					
• merger		256				
• other		9				

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005 and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables ranges between 155 and 265 per variable. The variables are categorized into operating synergy, financial synergy, management improvement, empire-building, and bargaining. Relative size of target to acquirer is calculated as the value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the previous fiscal year. The same sector dummy refers to the relatedness of businesses of acquirer and target and counts one if the first two digits of the four-digit SIC code of acquirer and target are the same. The difference between the debt- assets ratios of target and acquirer is derived by deducting acquirer's debt-assets ratio from target's debt-assets ratio. Acquirer and target debt-assets ratios were obtained by dividing total liabilities by the total assets, using book ratios. Tobin's q is calculated as market value of the assets divided by their book value. Dummy Tobin's q is a dummy variable set to one if the firm's Tobin's q is above its median value. Tobin's q is defined to be high if Dummy Tobin's q counts one. Acquirer – target Tobin's q refers to the combination of Tobin's qs of acquirer and target. Low-low refers to an acquisition where acquirer's Tobin's q and target's Tobin's q are both low. The percentage of shares owned by the executives of the acquirer resembles the summary of percentages of shares.

Source: Information on mergers and acquisitions, their value of transaction, source of financing, acquisition form, and acquisition technique is derived from SDC Platinum. Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Other balance sheet and income statement data of the acquiring and the target company in the year(s) preceding the acquisition are provided by Compustat North America.

Relative size

Relative size was calculated as the value of transaction of the target (derived from SDC Platinum) divided by the equity market capitalization of the acquirer at the end of the prior fiscal year (as derived from Compustat by multiplying the number of shares outstanding by the stock market price at the end of the acquirer's fiscal year preceding the acquisition: data 25 * data 199). On average, acquirers are about 2.4 times larger in size than their targets. Large variations in relative size exist.

Relatedness of business

In this research, a measure for relatedness of business was created. A dummy variable for 'same sector' was derived by comparing the first two digits of the four-digit SIC code of acquirer and target. If the first two digits were the same, acquirer and target were in the same industry and the dummy variable counted as one. The descriptives show that about 64 percent of the acquisitions are between companies in the same industry.

Difference between debt-asset ratios

The difference between target and acquirer's debt-assets ratio was calculated by subtracting acquirer's debt-assets ratio from target's debt-assets ratio. Acquirer's and target's debt-assets ratio were calculated following Moeller et al. (2004), using book values at the end of the prior fiscal year and were derived from Compustat. Acquirer's and target's debt-assets ratios were derived by dividing total liabilities (Compustat data 181) by the total assets (Compustat data 6). Although the average difference between debt-assets ratios amounted to 0.08, indicating that on average target's debt-assets ratio is higher when compared to acquirer's debt-assets ratio, large variations in outcomes exist. In order to examine whether an optimum level of difference between target and acquirer's debt-assets ratio can be found when attributing to value creation, a variable resembling the squared difference between target and acquirer's debt-assets ratio was also created.

Tobin's q

Following Chung and Pruitt (1994), Tobin's q is calculated as market value of the assets divided by their book value. Using Compustat data, Tobin's q was calculated in the following order: $(\text{data 25} * \text{data 199} + \text{data 10} + \text{data 181}) / \text{data 6}$.

The market value of the assets represents:

- the market value of shares, calculated by multiplying the number of shares outstanding by the stock market price at the end of the company's fiscal year preceding the acquisition ($\text{data 25} * \text{data 199}$)
- the book value of the total liabilities (data 181)
- the liquidating value of preferred stock (data 10).

The book value of the assets is represented by data 6.

Tobin's q is an indication of the performance of the company's management board. It gives an indication of management's quality. Mean acquirer Tobin's q turns out to be 2.18, and average target Tobin's q amounts to 2.05. Dividing companies into high Tobin's q and low Tobin's q, based on their median values, it is found that of the acquisitions one third are between low Tobin's q acquirers and low Tobin's q targets, one third between high Tobin's q acquirers and high Tobin's q targets, and one third between high Tobin's q acquirers and low Tobin's q targets or between low Tobin's q acquirers and high Tobin's q targets.

Debt-assets ratio

Acquirer's debt-assets ratio was based on book value (following Moeller et al. (2004)). Acquirer's and target's debt-assets ratios were derived by dividing total liabilities (Compustat data 181) by the total assets (Compustat data 6). Descriptives show that about 45 percent of the acquirer's assets are financed by debt.

Managerial ownership

Data resembling the total percentage of the acquiring company's shares owned by its executives were derived from Compustat. The data of Compustat show of each separate executive the percentage of shares they own. As most companies employ more than one executive, for this research, for each company all percentages of shares owned by the different executives in the acquiring company are summarized. It turns out that on average, executives own about 1.8 percent of the shares in the company.

Form of payment

Information about payment for the acquisition was derived from SDC Platinum. On average, payments for acquisitions consist of 51 percent cash, 43 percent stock, and 6 percent other securities. About 35 percent of the acquisitions were fully paid for in cash, whereas about 30 percent of the acquisitions were fully paid for in stock.

Acquisition techniques

SDC Platinum also provides information about the acquisition form and the acquisition technique. Descriptives show that in 48 observations, the acquisition technique (derived from SDC Platinum) was a tender offer and in 256 observations the form of the acquisition was a merger. All tender offers turned out to be mergers as well.

Variables left aside

Some of the variables suggested in chapter 3 could not be taken into consideration in this research because of a low number of relevant observations or because of a low frequency of certain events. Among them were the percentage of shares owned by all executives in the target company (only 44 observations) and the number of bidders for the target company (only in 13 out of 265 observations were two or more competing bidders involved). Further, the variable representing target management's attitude to the offer did not provide enough distinguishing characteristics, as only six observations showed a reaction of target management to the offer as other than friendly.

4.4 CONCLUSIONS

In this chapter data and data descriptives were discussed. It follows that the final sample consists of 488 observations of acquisitions occurring between 1997 and 2002. Not included in the sample are acquisitions arising in 2001, as regarding application of new accounting regulations on business combinations it is a transitional year. The composition of this sample of mergers and acquisitions including goodwill *provides evidence for hypothesis 1*, stating that new regulation results in more frequent reporting on purchased goodwill.

This final sample will be used for the research of chapter 5. In chapter 5 relative goodwill amounts before and after new accounting regulation coming into force are compared to each other, taking into account the industries of the acquisitions and recorded purchased intangible assets. The data described in section 4.3.1 form the basis of that research.

Chapter 6 will study relative goodwill after new regulation coming into force in more detail. It will examine the effect of characteristics of the efficiency theory on purchased goodwill under the new accounting regime, before and after controlling for the effect of the characteristics of other theories explaining mergers and acquisitions. The basis for the research consists of 265 observations. Relevant data for the research of chapter 6 are described in section 4.3.2.

In the appendix with this chapter, information on the foundations of the excess returns calculations as well as the tests on their significances can be found.

Appendix chapter 4: Stock excess returns and significance

A4-1 INTRODUCTION

This appendix to chapter 4 explains the three different procedures used to calculate stock excess returns: mean adjusted returns, market adjusted returns, and stock excess returns using the OLS market model. It further clarifies the t-tests that are performed to test whether the stock excess returns are significantly different from zero. In this research, the three procedures were followed when calculating stock excess returns, thereby using different time intervals and different stock markets weights. This appendix shows the outcomes of the significance tests of the acquirer and target stock excess returns. The test results show that almost all stock excess returns are significantly different from zero. Finally, in this appendix some conclusions are drawn.

A4-2 STOCK EXCESS RETURNS AND SIGNIFICANCE MEASURES

The most traditional way to evaluate stock excess returns is to estimate abnormal percentage returns with standard event study methods. In this research, these abnormal returns or, in other words, stock excess returns are estimated over an eleven-day event window (-5, +5), a seven-day event window (-3, +3), a five-day event window (-2, +2), a three-day event window (-1, +1) and a one-day event window (0) respectively, in which the event-day (0) is the first announcement day of the acquisition.

For every company, the stock excess return for each day in the event period is estimated using three different procedures: (i) mean adjusted returns, (ii) market adjusted returns, and (iii) OLS market model. Following Brown and Warner (1985), the three different procedures are described below.

(i) Mean adjusted returns

The mean adjusted stock return of company *i* on day *t* is derived by deducting the average of company *i*'s daily stock returns in the past from the stock return of that company *i* on day *t*. In this research, for the calculation of the average of a company's daily stock returns an (-205, -6) estimation period is used. In other words, the average of a company's daily stock returns is based on a 200 trading days' average of stock returns of that company, starting 205 trading days before the announcement day of the acquisition until six days before the announcement day of the acquisition. The corresponding formulae are as follows.

$$A_{i,t} = R_{i,t} - \bar{R}_i \quad (1)$$

$$\bar{R}_i = \frac{1}{200} \sum_{t=-205}^{t=-6} R_{i,t} \quad (2)$$

$A_{i,t}$ = stock excess return for company i on day t.

$R_{i,t}$ = the holding period stock return for company i on day t (so including dividends and distributions).

\bar{R}_i = the simple average of company i's daily returns in the (-205, -6) estimation period.

(ii) *Market adjusted returns*

Another approach to calculating the stock excess return of a company i on day t is by deducting the stock market return from the stock return of that company on that day. The following equation represents this calculation.

$$A_{i,t} = R_{i,t} - R_{m,t} \quad (3)$$

$A_{i,t}$ = stock excess return for company i on day t.

$R_{i,t}$ = the holding period stock return for company i on day t (so including dividends and distributions).

$R_{m,t}$ = the return on the CRSP weighted index including dividends and distributions for day t.

In this research, $A_{i,t}$ is determined in two ways:

- (1) making use of the CRSP equally weighted index (variable name ewret).
 $R_{m,t}$ then represents the stock markets return for day t, including all distributions, on an equally-weighted market portfolio;
- (2) making use of the CRSP value weighted index (variable name vwret).
 $R_{m,t}$ then represents the stock markets return for day t, including all distributions, on a value weighted market portfolio.

The CRSP weighted indices are based on three major US stock markets: New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and National Association of Securities Dealers Automated Quotation (NASDAQ).

(iii) *OLS market model*

The stock excess return of company i on day t can also be derived by deducting an estimated stock return of company i for day t from its stock return on day t. In this research, parameters (α and β) for calculating the estimated stock return are derived by performing linear regression analyses of company i's daily stock return data on daily stock market return data in the (-205, -6) estimation period, thereby using both the CRSP equally-weighted index and the CRSP value weighted index. The estimated stock return of company i for day t is derived by filling in the stock market return for day t in a formula using these parameters. The corresponding formulae run in the following order.

$$ER_{i,t} = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} \quad (4)$$

$$A_{i,t} = R_{i,t} - ER_{i,t} \quad (5)$$

$ER_{i,t}$ = estimated stock return for company i on day t, based on OLS regression in estimation period (-205, -6).

$\hat{\alpha}_i, \hat{\beta}_i$ = values of OLS parameters from the (-205, -6) estimation period of the return on the stock.

$R_{m,t}$ = the return on the CRSP weighted index including dividends and distributions for day t.

$A_{i,t}$ = stock excess return for company i on day t.

$R_{i,t}$ = the holding period stock return for company i on day t (so including dividends and distributions).

Test statistics of stock excess return measures

Given the stock excess returns based on each method, the statistical significance of the event period stock excess returns is assessed. The null hypothesis to be tested is that the mean day '0' (representing the announcement day of the acquisitions) stock excess return is equal to zero. The test statistic is the ratio of the day '0' mean stock excess return to its estimated standard deviation, and the standard deviation is estimated from the time-series of mean stock excess returns. The test statistic for any event day t (in this case t=0) is represented by the following formulae.

$$t = \frac{\bar{A}_t - 0}{\hat{S}(\bar{A}_t)} \quad (6)$$

where

$$\bar{A}_t = \frac{1}{N_t} \sum_{i=1}^{N_t} A_{i,t} \quad (7)$$

$$\hat{S}(\bar{A}_t) = \sqrt{\left(\sum_{t=-205}^{t=-6} (\bar{A}_t - \bar{\bar{A}}) \right) / 199} \quad (8)$$

$$\bar{\bar{A}} = \frac{1}{200} \sum_{t=-205}^{t=-6} \bar{A}_t \quad (9)$$

$A_{i,t}$ = stock excess return for company i on day t.

\bar{A}_t = average stock excess return of the companies' stocks on event day t.

$\bar{\bar{A}}$ = the simple average of the average mean excess returns of the companies' stocks in the estimation period.

\hat{S} = standard deviation of the average stock excess return on event day t.

Furthermore, it is tested whether the standardized stock excess returns are independent. In other words, the cross-sectional independence is measured. This is performed in the following order.

$$A'_{i,t} = \frac{A_{i,t}}{\hat{S}(A_i)} \quad (10)$$

$$\hat{S}(A_i) = \sqrt{\sum_{t=-205}^{t=-6} (A_{i,t} - A_i^*)^2 / 199} \quad (11)$$

$$A_i^* = \frac{1}{200} \sum_{t=-205}^{t=-6} A_{i,t} \quad (12)$$

The test statistic for any given day (in this case $t=0$) is then given by

$$\left(\sum_{i=1}^{N_t} A'_{i,t} \right) * (N_t)^{-\frac{1}{2}} \quad (13)$$

$A_{i,t}$ = stock excess return for company i on day t .

$A'_{i,t}$ = standardized stock excess return for company i on day t .

A_i^* = average stock excess return for company i over the estimation period.

\hat{S} = standard deviation for company i over the estimation period.

N_t = number of companies on day t .

As in this research multi-day intervals (i.e. event-windows varying up to 11 days around the announcement days) are being used, it is necessary not just to perform a test for the abnormal returns at $t=0$ but also for abnormal returns in a multi-day interval, the cumulative abnormal returns. In that case, the test statistic is the ratio of the cumulative mean excess return to its estimated standard deviation, and is given (for instance for an event-window of 11 days) by

$$\sum_{t=-5}^{+5} \bar{A}_t / \left(\sum_{t=-5}^{+5} \hat{S}^2(\bar{A}_t) \right)^{\frac{1}{2}} \quad (14)$$

where the terms in the denominator are from equation (8) in the text.

Another method that is applied to assess the significance of cumulative stock excess returns is to perform a regression of the cumulative stock excess return on a constant. This method differs from the other t -tests in that now the statistical significance of the cumulative stock excess return of individual companies is tested instead of the statistical significance of the standardized cumulative stock excess returns.

A4-3 STOCK EXCESS RETURNS AND T-TEST STATISTICS: ACQUIRERS

Regarding acquiring companies' stock, in this research the (i) mean adjusted returns, (ii) market adjusted returns, as well as (iii) stock excess returns using the OLS market model were calculated. In order to measure the significances of these acquirer stock excess returns, the above mentioned t-tests were performed. The number of acquiring companies taken into account in this research into the significance of the stock excess returns amounts to 371. This corresponds to the number of selected observations in the time period 2002-2005 (see Table 4-1, 389), on which the required CRSP data on acquiring companies are also available.

Results t-tests mean stock excess returns acquirers at t=0

The results of the t-tests on the average stock excess returns of the acquiring companies at the announcement date ($t=0$) can be found in Table A4-1. The standard t-tests are based on equation (6), and are performed on the three different estimates of stock excess returns on day 0 (the announcement day of the acquisition). Using the standard t-tests, it turns out that the average daily stock excess returns on the stock of the acquirer at announcement date are all negative. Most of them are statistically significantly different from zero at a 5 percent level. The results show that even when corrections are made for cross-sectional independence, using a t-test according to equation (10), most of the abnormal returns are statistically significantly different from zero – at least at a 10 percent level.

Table A4-1: Results t-tests mean stock excess returns acquirers at t=0 (n=371)

Variable	Mean	t-statistic	t-statistic correcting for heterogeneity
Mean adjusted stock excess return (eq. (1) and (2))	-0.005	-2.26**	-1.82*
Market adjusted stock excess return value weighted (eq. (3))	-0.004	-1.91*	-1.62
Market adjusted stock excess return equally weighted (eq. (3))	-0.005	-1.90*	-2.32**
Stock excess return OLS market model value weighted (eq. (5))	-0.004	-2.08**	-1.78*
Stock excess return OLS market model equally weighted (eq. (5))	-0.004	-2.34**	-2.10**

The sample comprises 389 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 371 cases provided information about acquirer stock returns.

Acquirer stock excess returns are measured using three different models: (i) the mean adjusted stock excess return method (equations 1 and 2), (ii) the market adjusted stock excess return method (equation 3), and (iii) the ordinary least squares (OLS) market model (equation 5, parameters estimated over (-205, -6) interval). In models ii and iii, both value weighted market index returns and equally weighted market index returns are used. The event window used to calculate the acquirer stock excess returns is one day (0).

*The table reports t-statistic (based on equation 6 in this appendix), and t-statistic correcting for heterogeneity (based on equation 10 in this appendix). The tests are two-tailed. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.*

Source: Information on mergers and acquisitions is derived from SDC-Platinum. Information on acquirer stock returns is provided by CRSP.

Results t-tests mean cumulative stock excess returns acquirers over multi-day intervals

In Table A4-2, the outcomes of the t-tests of the average cumulative stock excess returns of the acquiring companies for the different event-windows are given. Again, the t-tests are performed on the three different estimates of stock excess returns. Equation 14 represents the t-test used for calculating the significances. Almost all outcomes turn out to be statistically significant different from zero. The only exceptions are the market adjusted cumulative stock excess return value weighted eleven-day event window ($t = -0.97$), and five-day event window ($t = -1.41$).

Table A4-2: Results t-tests mean cumulative stock excess returns acquirers over multi-day intervals (n=371)

Variable	t-statistic
Mean adjusted cumulative stock excess return	
- eleven-day event window (-5, +5)	-2.11**
- seven-day event window (-3, +3)	-2.06**
- five-day event window (-2, +2)	-1.95*
- three-day event window (-1, +1)	-2.58***
- one-day event window (t=0)	-2.26**
Market adjusted cumulative stock excess return value weighted	
- eleven-day event window (-5, +5)	-.97
- seven-day event window (-3, +3)	-1.65*
- five-day event window (-2, +2)	-1.41
- three-day event window (-1, +1)	-2.05**
- one-day event window (t=0)	-1.91*
Market adjusted cumulative stock excess return equally weighted	
- eleven-day event window (-5, +5)	-2.05**
- seven-day event window (-3, +3)	-2.37**
- five-day event window (-2, +2)	-2.16**
- three-day event window (-1, +1)	-2.80***
- one-day event window (t=0)	-2.50**
OLS market model value weighted	
- eleven-day event window (-5, +5)	-2.40**
- seven-day event window (-3, +3)	-2.73***
- five-day event window (-2, +2)	-2.55**
- three-day event window (-1, +1)	-2.87***
- one-day event window (t=0)	-2.08**

Variable	t-statistic
OLS market model equally weighted	
- eleven-day event window (-5, +5)	-2.31**
- seven-day event window (-3, +3)	-2.55**
- five-day event window (-2, +2)	-2.49**
- three-day event window (-1, +1)	-2.99***
- one-day event window (t=0)	-2.34**

The sample comprises 389 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 371 cases provided information about acquirer stock returns.

Acquirer stock excess returns are measured using three different models: (i) the mean adjusted stock excess return method (equations 1 and 2), (ii) the market adjusted stock excess return method (equation 3), and (iii) the ordinary least squares (OLS) market model (equation 5, parameters estimated over (-205, -6) interval). In models ii and iii, both value weighted market index returns and equally weighted market index returns are used. The event windows used to calculate the cumulative acquirer stock excess returns are 11 days (-5, +5), seven days (-3, +3), five days (-2, +2), three days (-1, +1), and one day (0).

The table reports t-statistic, based on equation 14 in this appendix. The tests are two-tailed. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum. Information on acquirer stock returns is provided by CRSP.

Results of t-tests mean cumulative stock excess return individual acquirers over multi-day intervals

Moreover, regarding the OLS market model in Table A4-3, the significances of the average cumulative stock excess returns per acquiring company for the different event-windows are given. This additional analysis is performed for the OLS market model, as in this thesis the stock excess returns derived by the OLS market model are used for further research. From the outcomes it can be concluded that again most stock excess returns are statistically significantly different from zero at a 5 percent level. The only exception is for the acquirer stock excess return based on the value weighted one-day event window (t=-1.64).

Table A4-3: Results t-tests mean cumulative stock excess return individual acquirers over multi-day intervals (n=371)

Variable	t-statistic
OLS market model value weighted	
- eleven-day event window (-5, +5)	-2.42**
- seven-day event window (-3, +3)	-2.32**
- five-day event window (-2, +2)	-1.89*
- three-day event window (-1, +1)	-2.25**
- one-day event window (t=0)	-1.64

Variable	t-statistic
OLS market model equally weighted	
- eleven-day event window (-5, +5)	-2.39**
- seven-day event window (-3, +3)	-2.25**
- five-day event window (-2, +2)	-1.90*
- three-day event window (-1, +1)	-2.38**
- one-day event window (t=0)	-1.86*

The sample comprises 389 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 371 cases provided information about acquirer stock returns.

Acquirer stock excess returns are measured using the ordinary least squares (OLS) market model (equation 5, parameters estimated over (-205, -6) interval). Both value weighted market index returns and equally weighted market index returns are used. The event windows used to calculate the cumulative excess returns are 11 days (-5, +5), seven days (-3, +3), five days (-2, +2), three days (-1, +1), and one day (0).

The table reports t-statistics based on regressing cumulative acquirer stock excess returns on a constant term. The tests are two-tailed. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum. Information on acquirer stock returns is provided by CRSP.

A4-4 STOCK EXCESS RETURNS AND T-TEST STATISTICS: TARGETS

Regarding the target companies' stock, in this research (i) mean adjusted returns, (ii) market adjusted returns, as well as (iii) stock excess returns using the OLS market model were calculated. In accordance with the tests concerning the significance of the stock excess returns of the acquiring companies, several t-tests were performed on these target returns also. The number of target companies that were taken into account in this significance research, amounts to 315. This corresponds to the number of selected observations in the time period 2002-2005 (see Table 4-1, 389), which provides the required CRSP information on target companies.

Results t-tests mean stock excess returns targets at t=0

Table A4-4 shows the outcomes of the t-tests on the average stock excess returns of the target companies at the announcement date (t=0). The standard t-tests [based on equation (6) in this appendix] show that the targets' stock excess returns at t=0 are statistically highly different from zero for the three different estimates of stock excess returns, and both value weighted and equally weighted. It can be concluded that even when controlled for heterogeneity, all targets' stock excess returns at t=0 are statistically highly different from zero.

Table A4-4: Results *t*-tests mean stock excess returns targets at $t=0$ ($n=315$)

Variable	Mean	t-statistic	t-statistic correcting for heterogeneity
Mean adjusted stock excess return (eq. (1) and (2))	0.050	17.46***	21.57***
Market adjusted stock excess return value weighted (eq. (3))	0.051	17.80***	22.03***
Market adjusted stock excess return equally weighted (eq. (3))	0.050	17.92***	21.85***
Stock excess return OLS market model value weighted (eq. (5))	0.051	17.90***	22.39***
Stock excess return OLS market model equally weighted (eq. (5))	0.051	17.74***	22.30***

The sample comprises 389 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 315 cases provided information about target stock returns.

Target stock excess returns are measured using three different models: (i) the mean adjusted stock excess return method (equations 1 and 2), (ii) the market adjusted stock excess return method (equation 3), and (iii) the ordinary least squares (OLS) market model (equation 5, parameters estimated over $(-205, -6)$ interval). In models ii and iii, both value weighted market index returns and equally weighted market index returns are used. The event window used to calculate the target stock excess returns is one day (0).

The table reports *t*-statistic (based on equation 6 in this appendix), and *t*-statistic correcting for heterogeneity (based on equation 10 in this appendix). The tests are two-tailed. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum. Information on target stock returns is provided by CRSP.

Results *t*-tests mean cumulative stock excess returns targets over multi-day intervals

Table A4-5 shows the significances of the average cumulative target stock excess returns for the three different estimates of stock excess returns, the different event windows, and using the value weighted and the equally weighted index. Also in this case all targets' cumulative stock excess returns turn out to be statistically significantly different from zero.

Table A4-5: Results *t*-tests mean cumulative stock excess returns targets over multi-day intervals ($n=315$)

Variable	t-statistic
Mean adjusted cumulative stock excess return	
- eleven-day event window (-5, +5)	27.54***
- seven-day event window (-3, +3)	33.74***
- five-day event window (-2, +2)	35.08***
- three-day event window (-1, +1)	34.06***
- one-day event window ($t=0$)	17.46***
Market adjusted cumulative stock excess return value weighted	
- eleven-day event window (-5, +5)	28.60***
- seven-day event window (-3, +3)	34.31***

Variable	t-statistic
- five-day event window (-2, +2)	35.70***
- three-day event window (-1, +1)	34.75***
- one-day event window (t=0)	17.81***
Market adjusted cumulative stock excess return equally weighted	
- eleven-day event window (-5, +5)	28.06***
- seven-day event window (-3, +3)	34.06***
- five-day event window (-2, +2)	35.45***
- three-day event window (-1, +1)	34.47***
- one-day event window (t=0)	17.59***
OLS market model value weighted	
- eleven-day event window (-5, +5)	27.84***
- seven-day event window (-3, +3)	33.92***
- five-day event window (-2, +2)	35.39***
- three-day event window (-1, +1)	34.62***
- one-day event window (t=0)	17.90***
OLS market model equally weighted	
- eleven-day event window (-5, +5)	27.94***
- seven-day event window (-3, +3)	33.98***
- five-day event window (-2, +2)	35.38***
- three-day event window (-1, +1)	34.55***
- one-day event window (t=0)	17.74***

The sample comprises 389 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 315 cases provided information about target stock returns.

Target stock excess returns are measured using three different models: (i) the mean adjusted stock excess return method (equations 1 and 2), (ii) the market adjusted stock excess return method (equation 3), and (iii) the ordinary least squares (OLS) market model (equation 5, parameters estimated over (-205, -6) interval). In models ii and iii, both value weighted market index returns and equally weighted market index returns are used. The event windows used to calculate the cumulative target stock excess returns are 11 days (-5, +5), seven days (-3, +3), five days (-2, +2), three days (-1, +1), and one day (0).

The table reports t-statistic, based on equation 14 in this appendix. The tests are two-tailed. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum. Information on target stock returns is provided by CRSP.

Results t-tests mean cumulative stock excess return individual targets over multi-day intervals

In accordance with the significance tests of the acquiring companies, additional t-tests are performed regarding the outcomes of the OLS market model. Table A4-6 shows the significances of the mean cumulative stock excess returns of the individual target companies over multi-day intervals. Also in this case the targets cumulative stock excess returns are statistically significantly different from zero.

Table A4-6 Results t-tests mean cumulative stock excess return individual targets over multi-day intervals (n=315)

Variable	t-statistic
OLS market model value weighted	
- eleven-day event window (-5, +5)	13.05***
- seven-day event window (-3, +3)	13.16***
- five-day event window (-2, +2)	12.78***
- three-day event window (-1, +1)	11.14***
- one-day event window (t=0)	5.93***
OLS market model equally weighted	
- eleven-day event window (-5, +5)	13.19***
- seven-day event window (-3, +3)	13.27***
- five-day event window (-2, +2)	12.84***
- three-day event window (-1, +1)	11.19***
- one-day event window (t=0)	5.88***

The sample comprises 389 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 315 cases provided information about target stock returns.

Target stock excess returns are measured using the ordinary least squares (OLS) market model (equation 5, parameters estimated over (-205, -6) interval). Both value weighted market index returns and equally weighted market index returns are used. The event windows used to calculate the cumulative excess returns are 11 days (-5, +5), seven days (-3, +3), five days (-2, +2), three days (-1, +1), and one day (0).

*The table reports t-statistics based on regressing cumulative target stock excess returns on a constant term. The tests are two-tailed. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.*

Source: Information on mergers and acquisitions is derived from SDC-Platinum. Information on target stock returns is provided by CRSP.

A4-5 CONCLUSIONS

In this appendix, following Brown and Warner (1985), (i) mean adjusted returns, (ii) market adjusted returns, as well as (iii) OLS market model-excess returns of both the acquiring company and the target company were calculated. They were calculated for different time intervals (event periods) and with different weights of stock market returns (value weighted and equally weighted). This resulted in a wide variety of acquirer and target stock excess returns. To measure adequately the significances of these different acquirer and target stock excess returns, three different t-tests were explained and performed. The results of these t-tests show that almost all stock excess returns are significantly different from zero, irrespective of the stock excess return measure, event periods, or stock market weights used. Only regarding the acquirer stock excess returns are some minor exceptions showing no significance available. The main conclusion that can be drawn

from the research on stock excess returns in this appendix is that the t-tests overall show that the stock excess returns are statistically significantly different from zero, and therefore are reliable measures. In the continuation of this research, equally weighted OLS market model-excess returns of both acquiring companies and target companies are used. Thereby all event periods are taken into account. Regarding the equally weighted OLS market model-excess returns, all t-tests show that the stock excess returns are statistically significantly different from zero. Moreover, for the continuation of this research, equally weighted stock excess returns are selected instead of value weighted stock excess returns, as large publicly traded funds have less impact on the stock market return then. The large diversity of sizes of both acquiring and target companies justifies this choice.

5 Research into goodwill and economic consequences of changes in accounting – are accounting goodwill and economic goodwill converging?

5.1 INTRODUCTION

Regarding the US financial accounting standards (US GAAP 2001), a number of important changes took place some years ago. At that time, new US GAAP on business combinations (SFAS 141) and intangibles (SFAS 142) came into force and replaced APB Opinion No. 16 and APB Opinion No. 17. The new rules require that in all mergers and acquisitions, one of the combining/merging firms is marked as the acquiring firm, and that purchased goodwill is entered as an intangible asset on the balance sheet of the acquiring firm. Purchased goodwill should represent the purchase price of the acquired firm minus the fair value of its net assets. Furthermore, amortizations on goodwill are no longer allowed. They are replaced by an impairment test that must be carried out on a yearly basis, followed by an impairment when it turns out that carrying value amounts exceed fair value amounts. Besides, new regulation concerning the recognizing of intangible assets has become tighter, which in turn has an effect on the amount of reported goodwill. These new regulations probably result in larger availability of data on purchased goodwill and in further subdivision of the purchase price into other assets acquired and debt assumed in the annual reports of the acquirer. Furthermore, due to more stringent regulation, the information content of purchased goodwill may have increased: it may have become a more concise term that may provide more relevant information about expected value creation of the acquisition.

In this chapter, the impact of the new regime on accounting for purchased goodwill is empirically investigated. Information regarding purchased goodwill as supplied by the financial statements of publicly quoted US companies before and after new regulation coming into force is compared. It is examined whether the new accounting standards have resulted in changes of supply of information concerning purchased goodwill. The research of this chapter addresses the *first research question* in 1.2:

- (I) What is the effect of the new regulation standards on the amount of purchased goodwill in relation to the total purchase price for the acquisition?

The corresponding hypotheses to be tested in this chapter are derived from section 2.6.2:¹⁵⁰

- Hypothesis 2: New regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition.
- Hypothesis 3: New regulation leads to more frequent reporting on separately acquired intangibles.
- Hypothesis 4: Reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill.

First, the impact of the new regime on accounting for purchased goodwill is empirically investigated. New and old regimes are compared regarding the relative amounts of purchased goodwill. As it is expected that the relative amount of purchased goodwill is partly determined by the industry the target company is in (e.g. services, technology), the study controls for the effect of industry on purchased goodwill.

Further, it is tested whether the availability of information on intangible assets apart from purchased goodwill (as intended by the new regulation) contributes to a lower relative amount of purchased goodwill. Another question here is whether under the new regime more frequent reporting on separately acquired intangibles is found.

This is *followed* by an in-depth analysis of intangible assets, where the contents of information about intangible assets as well as relative amounts accounted for are compared in the two time periods.

Then, regressions of relative amounts of purchased goodwill are performed to test for the combined effects of new regulation, the availability of separately reported intangible assets, and the industry the target company is in.

The structure of this chapter is as follows: Section 5.2 contains the explanation of the model. Section 5.3 contains a discussion of the results of the research. The chapter closes with the conclusions in section 5.4.

5.2 MODEL

The comparative research is set up in the following order.

First it is examined whether the relative amount of goodwill (i.e. goodwill as a percentage of the money involved in the acquisition) of acquisitions that

150 These hypotheses are research hypotheses (or experimental hypotheses) which display the predicted effect (H1). Each of these hypotheses has corresponding null hypotheses (H0) about the reverse possibilities. The axioms of the statistical research in chapter 5 are the reverse null hypotheses. In the research it is tested whether or not the null hypotheses are rejected and thereafter whether or not the corresponding research hypotheses are supported (Field, 2005, 23, and Aron et al., 2008, 148-149).

took place in the time period 2002-2005 differs significantly from the relative amount of goodwill of acquisitions that took place during the time period 1997-2000. This is done by making use of group mean comparison t-tests.

If the division among industries in which the acquisitions took place differs greatly between the two time periods, this may be attributed to different relative amounts of purchased goodwill between these time periods, and result in a blurred view of the effect of new regulation on these relative amounts. Purchased goodwill diverges between the industries of the target companies. In this context, a distinction between old economy industries and new economy industries plays a role. Whereas old economy industries mainly contain (old) industrial companies, new economy industries consist mainly of high-technology companies and of companies from the services industry. The amount of purchased goodwill is expected to be higher in the case of acquisitions of companies in new economy industries, as from an accounting perspective companies in these industries contain a relatively high component of valuable properties that cannot be entered as separate assets, such as know-how and well-qualified staff. Taking into account the differences between old economy and new economy industries with regard to expected relative goodwill amounts, the acquisitions are therefore classified into two different groups of industries:

- (1) a classification into services and other industries, and
- (2) a classification into technology and other industries.

To control for different distribution due to different divisions among industries during the time periods, the same group mean comparison t-tests are performed, but after having classified the acquisitions into services and technology respectively.

The classification into industries takes place according to the specific area of the target company. As mentioned, the relative amount of goodwill is expected to be higher when the target company is from the services or technology industry (in both cases when compared to the other industries).

The tests of the effect of new regulation on purchased goodwill are one-tailed, as it is expected that in the time period 2002-2005 (that is, after new regulation coming into force) purchased goodwill forms a smaller component of the purchase price when compared to the time period 1997-2000 (that is, before new regulation coming into force).

This part of the model tests for *hypothesis 2*, according to which new regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition.

Second, the effect of the availability of information on intangible assets apart from purchased goodwill on the recorded amounts of purchased goodwill is examined. It is expected that separate disclosures of intangible assets apart from goodwill contribute to lower amounts of purchased goodwill. Besides, it is presumed that the more elaborate rules regarding the separate disclosure

of intangible assets attribute to a lower going-concern component of goodwill, and therefore a lower amount of purchased goodwill under the new regime when compared to the old regime. Both effects are tested for making use of mean comparison t-tests.

Here *hypothesis 3*, stating that new accounting regulation leads to more frequent reporting on separately acquired intangibles, and *hypothesis 4*, which states that reporting on separately acquired intangibles reduces purchased goodwill, are tested.

Third, separate reporting on intangibles by the acquiring companies is analyzed in more detail. It is tested whether the new regulation regarding reporting on intangible assets results in changes in reporting on acquired intangibles with respect to content and relative amounts. Two-tailed mean comparison tests are performed to examine the differences in amounts of intangible assets between the two time periods, taking into account the industries the acquisitions are in. Although no separate hypothesis is formulated for this part of the research, a possible hypothesis to be tested here is that new regulation on intangible assets brings less ambiguity in reporting on intangible assets.

Fourth, after having performed these different mean comparison t-tests, the combined effect of (a) the time period (regime) in which the acquisition took place, (b) the industry the target is in, and (c) reporting on intangible assets apart from goodwill on the relative amount of goodwill are all tested on the full sample. For this, regressions of the relative amount of goodwill are performed on these characteristics. First, a regression is performed without taking into consideration that interaction between the characteristics may occur.

The corresponding model (I) is as follows:

$$(I) \text{ relative goodwill} = a + b1 * D_{\text{timeperiod}} + b2 * D_{\text{services}} + b3 * D_{\text{technology}} + b4 * D_{\text{intangible assets}} + \varepsilon$$

relative goodwill = goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;

$D_{\text{timeperiod}}$ = dummy variable set to one if the acquisition is announced and effective in time period 2002-2005;

D_{services} = dummy variable set to one if the target company is in the services industry;

$D_{\text{technology}}$ = dummy variable set to one if the target company is in the technology industry;

$D_{\text{intangible assets}}$ = dummy variable set to one if the acquiring company reports on acquired intangible assets.

In this model, all characteristics are represented by dummies, which count 1 when the time period is 2002-2005, the target is from the services industry, the target is from the technology industry, and the acquiring company is reporting intangible assets apart from purchased goodwill, respectively.

In model (I), in the first instance the possibility of interaction between the characteristics is ignored. However, the characteristics 'services' and 'technology' may overlap when explaining the relative amount of goodwill. The same applies for the time period when the acquisition took place in combination with reporting on intangible assets apart from goodwill, as from chapter 4 it results that after the introduction of new regulation, a higher percentage of acquiring companies report intangible assets apart from goodwill.

In order to correct for this and to gain an insight into the interaction between the characteristics, two interaction variables are included in the analysis:

The first variable concerns the interaction between the classification into industries and is derived by multiplying the dummies of these classifications by each other:

$$D_{\text{services}} * D_{\text{technology}}$$

The second variable concerns the interaction between the time period and reporting on intangible assets apart from goodwill, and is derived in the following order:

$$D_{\text{timeperiod}} * D_{\text{intangible assets}}$$

A second regression controlling for these interactions is performed, thereby making use of the following model (II):

$$(II) \text{ relative goodwill} = a + b1 * D_{\text{timeperiod}} + b2 * D_{\text{services}} + b3 * D_{\text{technology}} + b4 * D_{\text{services}} * D_{\text{technology}} + b5 * D_{\text{intangible assets}} + b6 * D_{\text{timeperiod}} * D_{\text{intangible assets}} + \varepsilon$$

relative goodwill = goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;

$D_{\text{timeperiod}}$ = dummy variable set to one if the acquisition is announced and effective in time period 2002-2005;

D_{services} = dummy variable set to one if the target company is in the services industry;

$D_{\text{technology}}$ = dummy variable set to one if the target company is in the technology industry;

$D_{\text{intangible assets}}$ = dummy variable set to one if the acquiring company reports on acquired intangible assets;

- $D_{\text{services}} * D_{\text{technology}}$ = interaction variable set to one if target is in the services industry and in the technology industry;
- $D_{\text{timeperiod}} * D_{\text{intangible assets}}$ = interaction variable set to one if the acquisition is announced and effective in time period 2002-2005 and if the acquiring company reports on acquired intangible assets.

The regression analyses test whether hypothesis 2 and hypothesis 4 stand if a combination of factors is taken into account.

Data and descriptives have been expounded in chapter 4. For both t-tests and regressions, this research uses information from the entire sample of 488 acquisitions. For the t-tests, it compares acquisitions realized in the period before new regulation (time period 1997-2000, 222 observations) to acquisitions that took place in the time period after new regulation came into force (time period 2002-2005, 266 observations). More information about data and descriptives can be found in section 4.3.1 and in Table 4-4 of chapter 4.

When performing the mean comparison t-tests and the regressions of relative goodwill, two definitions of relative goodwill are used:

- goodwill divided by purchase price: relative goodwill 1;
- goodwill divided by transaction value: relative goodwill 2.

So each test in this chapter is done twice: one time on relative goodwill 1, and the other time on relative goodwill 2. The same applies for the regressions of relative goodwill in this chapter, as shown by models (I) and (II). Regressions of relative goodwill 1 as well as of relative goodwill 2 are performed. When comparing relative intangible amounts, a similar approach is used.

By using these two different measures (purchase price and value of transaction) to calculate the relative amounts, the price paid for the acquisition is considered from two different points of view: from the *financial accounting perspective* (purchase price) and from the *finance perspective* (value of transaction). This is further clarified in section 4.3.1.1. Results of the analyses are shown in section 5.3.

5.3 RESULTS

In this section, the results of the t-tests and the regression analyses are discussed. In section 5.3.1, relative amounts of goodwill in the time periods 1997-2000 and 2002-2005 are compared. In section 5.3.2 the same tests are conducted, but now after having classified the acquisitions into different

industries. In section 5.3.3 relative goodwill amounts are compared when classified into the presence of intangibles. This is followed by an in-depth analysis of separate reporting on intangibles in section 5.3.4. Figure 5-I and Figure 5-II further clarify how the research regarding the mean comparison tests on goodwill and intangibles is structured. Finally, by performing regression analyses, the combined effect of the characteristics on goodwill is examined in section 5.3.5.

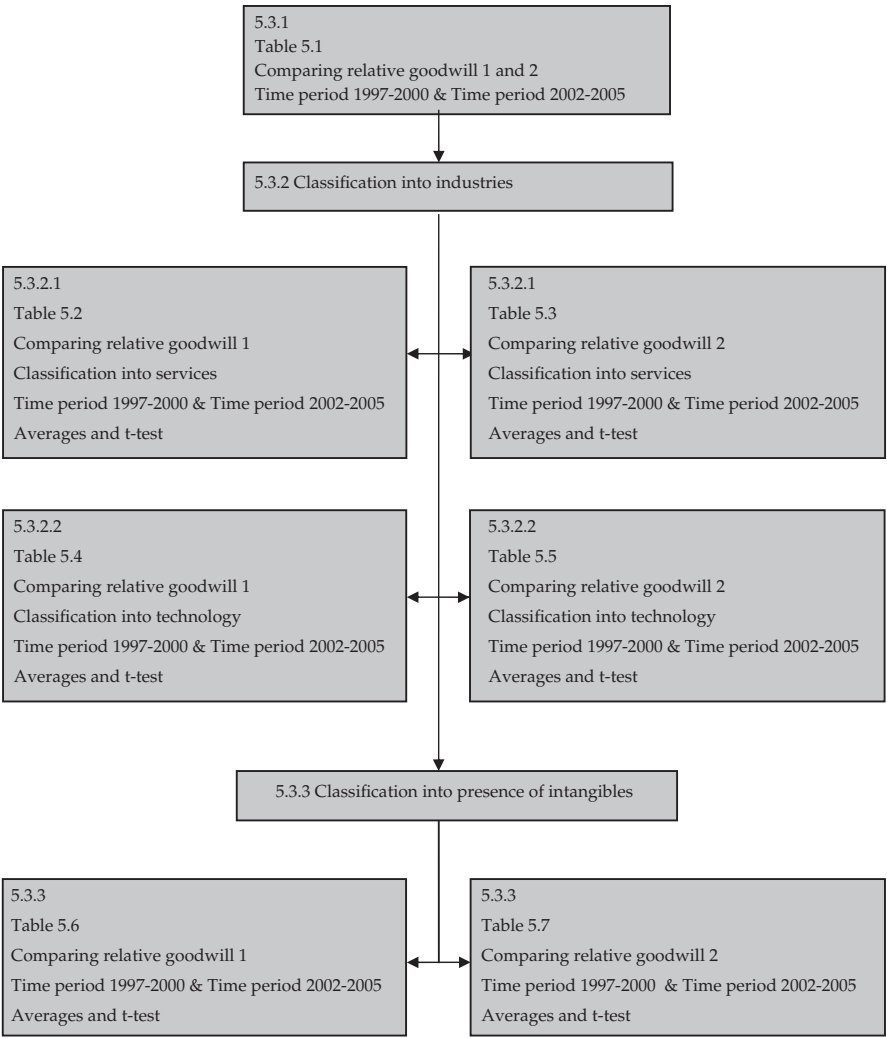


Figure 5-I: Comparing goodwill amounts: structure of the t-test research

5.3.1 Comparing goodwill

In this section, relative amounts of goodwill in the time periods 1997-2000 and 2002-2005 are compared. Table 5-1 shows that relative goodwill 1 (defined as purchased goodwill divided by the purchase price) in the time period 2002-2005 is statistically significant lower when compared to relative goodwill in the time period 1997-2000. Whereas in the time period 1997-2000, relative goodwill 1 on average accounted for 65 percent of the purchase price, in 2002-2005 this percentage averaged about 59 percent.

A comparison of relative goodwill 2 (defined as purchased goodwill divided by the value of transaction of the acquisition) shows similar results. In the time period 1997-2000, average amounts of purchased goodwill accounted for 68 percent of the value of transaction. In the time period 2002-2005 this percentage declined to an average of 60 percent. The differences are significant at 5 percent and 1 percent levels respectively ($p=0.015$ when comparing relative goodwill 1, and $p=0.009$ when comparing relative goodwill 2).

Table 5-1: Comparing relative goodwill amounts in the different time periods: averages and t-test

	I time period 1997-2000	II time period 2002-2005	Difference average value I – II (H_a : diff > 0)
Relative goodwill 1	0.652 (0.022) 222	0.592 (0.017) 266	$t=2.173^{**}$ $p=0.015$
Relative goodwill 2	0.676 (0.027) 222	0.598 (0.020) 266	$t=2.385^{***}$ $p=0.009$

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. In this table, the differences between the relative amounts of goodwill in the two time periods are tested. Two different measures of relative amounts of goodwill are used: relative goodwill 1, representing goodwill divided by the purchase price of the acquisition, and relative goodwill 2, defined as goodwill divided by the transaction value of the acquisition. The table reports on relative goodwill amounts in the different time periods, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative goodwill amounts. Difference tests are based on one-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

The test results *support hypothesis 2*: new regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition. In 5.3.2 it is tested whether hypothesis 2 also stands when corrections are made for the industry the target company is in.

5.3.2 Comparing goodwill when classified into industries

To control for different distribution that may arise when the division among industries in which the acquisitions took place differs greatly between the time periods, the same group mean comparison t-tests are performed, but after having classified the acquisitions into different industries.

5.3.2.1 Classification into services

Table 5-2 compares relative goodwill 1 in the different time periods, when the industries of the acquisition targets are classified into services and no services. The results show that even after this correction, relative goodwill in the time period 2002-2005 remains significantly lower when compared to relative goodwill in the time period 1997-2000. Relative goodwill decreased significantly in the services industries ($p=0.030$) as well as in the no-services industries ($p=0.023$). As expected, it further emerges that purchased goodwill in the services industries is relatively high in relation to purchased goodwill in other industries. This difference is statistically significant in the time period 1997-2000 ($p=0.003$) as well as that of 2002-2005 ($p=0.000$).

Table 5-2: Comparing relative goodwill 1 in the different time periods when classified into (a) no services and (b) services: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (H_a : diff > 0)
Relative goodwill 1			
(a) no services	0.611 (0.026) <i>155</i>	0.542 (0.023) <i>154</i>	$t = 2.012^{**}$ $p = 0.023$
(b) services	0.746 (0.039) <i>67</i>	0.661 (0.026) <i>112</i>	$t = 1.895^{**}$ $p = 0.030$
Difference average value (a) – (b) H_a: diff < 0	$t = -2.837^{***}$ $p = 0.003$	$t = -3.425^{***}$ $p = 0.000$	

*The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. In this table, the differences between relative goodwill 1 amounts in the two time periods are tested, when classified into services and other industries. Relative goodwill 1 represents goodwill divided by the purchase price of the acquisition. The table reports on relative goodwill 1 amounts in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative goodwill amounts. Difference tests are based on one-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.*

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Similar results are shown in Table 5-3, in which relative goodwill 2 amounts are compared. Although the decline of relative goodwill 2 in the no-services industries in the time period 2002-2005 compared to 1997-2000 is only significantly different from zero at 10 percent ($p=0.055$), it almost reaches the 5 percent significance level. In the services sector the decrease of relative goodwill is significantly different from zero ($p=0.002$).

Also in this case, both time periods show a significantly higher relative goodwill amount in the services industries when compared to the no-services industry ($p=0.000$ and $p=0.001$ for the time periods 1997-2000 and 2002-2005 respectively).

Table 5-3: Comparing relative goodwill 2 in the different time periods when classified into (a) no services and (b) services: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (H_a : diff > 0)
Relative goodwill 2			
(a) no services	0.613 (0.031) <i>155</i>	0.547 (0.027) <i>154</i>	$t = 1.608^*$ $p = 0.055$
(b) services	0.824 (0.049) <i>67</i>	0.669 (0.028) <i>112</i>	$t = 2.949^{***}$ $p = 0.002$
Difference average value (a) – (b) H_a: diff < 0	$t = -3.740^{***}$ $p = 0.000$	$t = -3.063^{***}$ $p = 0.001$	

*The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. In this table, the differences between relative goodwill 2 amounts in the two time periods are tested, when classified into services and other industries. Relative goodwill 2 is defined as goodwill divided by the transaction value of the acquisition. The table reports on relative goodwill 2 amounts in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative goodwill amounts. Difference tests are based on one-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.*

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

5.3.2.2 Classification into technology

Table 5-4 and Table 5-5 show the outcomes of comparable analyses on relative goodwill amounts, with a classification of the industries of the targets into technology instead of into services. From Table 5-4, in which relative goodwill 1 amounts are compared, it turns out that after this correction, relative goodwill in the time period 2002-2005 remains lower in both groups of industries. For acquisitions of targets in the technology

industries, this lower amount is statistically significant at the 5 percent level ($p=0.033$). For acquisitions of targets from other industries the significance of this difference is weaker; the level of significance then is 10 percent ($p=0.070$).

Table 5-4 further shows that, as expected, relative goodwill amounts are higher in technology industries when compared to other, no-technology industries. However, the significance of the differences in amounts between the two groups of industries is weak: the differences are significant at a 10 percent level in the time period 1997-2000 ($p=0.093$) and not significant – although almost at a 10 percent level ($p=0.106$) – in 2002-2005.

Table 5-4: Comparing relative goodwill 1 in the different time periods when classified into (a) no technology and (b) technology: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0)
Relative goodwill 1			
(a) no technology	0.628 (0.030) <i>131</i>	0.570 (0.025) <i>134</i>	$t = 1.484^*$ $p = 0.070$
(b) technology	0.687 (0.033) <i>91</i>	0.614 (0.024) <i>132</i>	$t = 1.849^{**}$ $p = 0.033$
Difference average value (a) – (b) Ha: diff < 0	$t = -1.326^*$ $p = 0.093$	$t = -1.251$ $p = 0.106$	

*The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. In this table, the differences between relative goodwill amounts 1 in the two time periods are tested, when classified into technology and other industries. Relative goodwill 1 represents goodwill divided by the purchase price of the acquisition. The table reports on relative goodwill amounts 1 in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative goodwill amounts. Difference tests are based on one-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.*

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Table 5-5 demonstrates the results when relative goodwill 2 is used instead of relative goodwill 1. In line with the outcomes of goodwill 1, it shows that although for both groups of industries in the time period 2002-2005 relative goodwill 2 is a lower number, this difference is only highly significant for acquisitions of targets in the technology industries ($p=0.009$). Acquisitions of targets in other industries show a difference with a lower significance of 10 percent ($p=0.082$). Further, in line with expectations, it appears that in both time periods relative goodwill 2 is significantly higher for acquisitions of

targets in the technology industries ($p=0.014$ for time period 1997-2000 and $p=0.048$ for time period 2002-2005).

Table 5-5: Comparing relative goodwill 2 in the different time periods when classified into (a) no technology and (b) technology: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0)
Relative goodwill 2			
(a) no technology	0.628 (0.034) <i>131</i>	0.565 (0.029) <i>134</i>	$t = 1.397^*$ $p = 0.082$
(b) technology	0.747 (0.042) <i>91</i>	0.632 (0.028) <i>132</i>	$t = 2.393^{***}$ $p = 0.009$
Difference average value (a) – (b) Ha: diff < 0	$t = -2.211^{**}$ $p = 0.014$	$t = -1.668^{**}$ $p = 0.048$	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. In this table, the differences between relative goodwill 2 amounts in the two time periods are tested, when classified into technology and other industries. Relative goodwill 2 is defined as goodwill divided by the transaction value of the acquisition. The table reports on relative goodwill 2 amounts in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative goodwill amounts. Difference tests are based on one-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

To conclude, after also controlling for the target's industries, *hypothesis 2 is supported*. Both classifications into services and other and into technology and other show lower goodwill numbers for the time period 2002-2005 when compared to that of 1997-2000, although in the no-technology industry these differences are only significant at the 10 percent level.

5.3.3 Comparing goodwill when classified into reporting on intangibles

In this section, it is examined whether separate reporting on other intangible assets influences the relative amount of goodwill as accounted for by the acquiring company. It is expected that acquiring companies that disclose acquired intangible assets apart from goodwill report lower relative amounts of purchased goodwill: goodwill then is much less a residual, containing other intangibles. Besides, it is presumed that the more elaborate rules regarding the separate disclosure of intangible assets contribute to a lower

going concern component of goodwill, resulting in a lower amount of purchased goodwill under the new regime when compared to the old regime. Both effects are tested for making use of mean comparison t-tests. Further, it is tested whether regulation leads to more frequent reporting on separately acquired intangibles.

Table 5-6 and Table 5-7 show relative goodwill amounts in the time periods 1997-2000 and 2002-2005, when goodwill data are classified into (a) no reporting and (b) reporting on intangible assets. Both tables show that in the time period 2002-2005, the reporting rate¹⁵¹ on intangibles increased when compared to time period 1997-2000. Whereas in 2002-2005, 87 percent¹⁵² of the acquiring companies reported on acquired intangible assets, in 1997-2000 only 54 percent¹⁵³ of the acquiring companies mentioned these assets. As expected, Table 5-6 shows that in 1997-2000, when compared to acquiring companies that do not make any mention of acquired intangibles, relative goodwill 1 is strongly significantly lower when companies do mention other intangibles ($p=0.006$). However, regarding relative goodwill amounts in the time period 2002-2005, no significant difference can be found between the two groups ($p=0.311$). A possible explanation for these different outcomes may be that the stricter regulations regarding disclosure of purchased intangible assets in the time period 2002-2005 led to the listing of purchased intangible assets when they were actually present. The large number of acquiring companies reporting on intangible assets in addition to goodwill (232 or 87 percent) show a similar pattern. When no separate intangible assets were specified in the justification of the purchase price in the notes to the financial statements of the acquiring company, they were probably not there. Thus, the fact that there is no disclosure of intangible assets has no effect on the relative size of purchased goodwill. These results indicate that under new regulation, the component of intangible assets included in goodwill has decreased. In other words, there is less noise in goodwill from other intangibles. Conversely, regarding the time period 1997-2000, the omission of separate reporting on intangible assets might have resulted in higher purchased goodwill amounts. This also explains the difference ($p=0.066$) between relative amounts of goodwill in the different time periods when no purchased intangible assets are referred to: the relatively lower amount of goodwill in 2002-2005 can be explained by the actual absence of purchased intangible assets, while in 1997-2000 such intangible assets are possibly classified as purchased goodwill. In the case of separate reporting on intangible assets, no evidence can be found for the expectation that more elaborate rules regarding the separate disclosure of

151 The reporting rate on intangibles concerns the percentage of acquiring companies mentioning acquired intangible assets apart from purchased goodwill.

152 232 out of 266 observations.

153 119 out of 222 observations.

intangible assets lead to a lower amount of relative goodwill in the time period 2002-2005 when compared to that of 1997-2000 ($p=0.360$).

Table 5-6: Comparing relative goodwill 1 in the different time periods when classified into (a) no reporting on intangible assets and (b) reporting on intangible assets

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0)
Relative goodwill 1			
(a) no reporting on intangible assets	0.712 (0.032) <i>103 (46%)</i>	0.614 (0.057) <i>34 (13%)</i>	$t = 1.512^*$ $p = 0.066$
(b) reporting on intangible assets	0.601 (0.030) <i>119 (54%)</i>	0.589 (0.018) <i>232 (87%)</i>	$t = 0.358$ $p = 0.360$
Difference average value (a) – (b) Ha: diff > 0	$t = 2.552^{***}$ $p = 0.006$	$t = 0.493$ $p = 0.311$	

*The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. In this table, the differences between relative goodwill 1 in the two time periods are tested, when classified into reporting on intangible assets. Relative goodwill 1 represents goodwill divided by the purchase price of the acquisition. The table reports on relative goodwill 1 classified in the different time periods and in reporting on intangible assets, in parentheses the standard errors, in italics the number of observations, and, in parentheses and between brackets, the percentages of the observations. It shows the t-statistics and the p-values of the differences between the relative goodwill amounts. Difference tests are based on one-tailed mean comparison t-tests. * ** *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively. Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).*

The results of Table 5-7 are broadly consistent with the results of Table 5-6. The strong significance of lower relative goodwill 2 amounts in the time period 1997-2000, when intangible assets are separately reported ($p=0.022$), again emphasizes the pressure of separate disclosure of intangible assets on relative amounts of goodwill. Regarding the time period 2002-2005, the average relative goodwill amounts are surprising: the average amount of relative goodwill 2 turns out to be higher (significant at 10 percent level, $p=0.066$) in the case of separate reporting on intangible assets when compared to no mention of intangible assets. These results again are in line with the assumption that the clearer and stricter the regulations regarding entering intangibles as assets, the more this will result in actual reporting on intangible assets when they are there. Therefore, under new regulation, the absence of intangibles no longer seems to result in higher goodwill. On the contrary, in 2002-2005 the group of acquiring companies that separately report intangible assets show on average higher relative goodwill 2 amounts when compared to the group that does not give any notice of intangibles.

This weakly significant outcome indicates that companies with intangible assets are valuable acquisition targets.

When compared to relative goodwill 1, relative goodwill 2 shows even more clearly the difference in relative amounts of purchased goodwill between the time periods, when no other intangible assets were reported: when compared to the time period 2002-2005, in 1997-2000 relative goodwill 2 is significantly higher ($p=0.002$). As explained before, this points towards noise in the purchased goodwill term, caused by intangibles that were accounted for as goodwill in 1997-2000. The absence of a significant difference in relative amounts of purchased goodwill between the two time periods in the case of separately reported intangible assets ($p=0.410$) confirms this assumption.

Table 5-7: Comparing relative goodwill 2 in the different time periods when classified into (a) no reporting on intangible assets and (b) reporting on intangible assets

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0)
Relative goodwill 2			
(a) no reporting on intangible assets	0.734 (0.037) <i>103 (46%)</i>	0.520 (0.053) <i>34 (13%)</i>	$t = 2.987^{***}$ $p = 0.002$
(b) reporting on intangible assets	0.626 (0.037) <i>119 (54%)</i>	0.610 (0.021) <i>232 (87%)</i>	$t = 0.410$ $p = 0.411$
Difference average value (a) – (b) Ha: diff > 0	$t = 2.030^{**}$ $p = 0.022$	$t = -1.512^*$ $p = 0.934$	

*The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. In this table, the differences between relative goodwill 2 in the two time periods are tested, when classified into reporting on intangible assets. Relative goodwill 2 is defined as goodwill divided by the transaction value of the acquisition. The table reports on relative goodwill 2 classified in the different time periods and in reporting on intangible assets, in parentheses the standard errors, in italics the number of observations, and, in parentheses and between brackets, the percentages of the observations. It shows the t-statistics and the p-values of the differences between the relative goodwill amounts. Difference tests are based on one-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively. Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).*

Summarizing, overall the comparison of relative goodwill amounts between the time periods when classified into reporting on intangible assets *provides evidence for hypothesis 3*: a growth of the reporting rate on intangible assets from 54 percent in the time period 1997-2000 to 87 percent in the time period 2002-2005 indicates that new regulation leads to more frequent reporting on

separately acquired intangibles. This finding is further supported by the outcomes of a Pearson χ^2 test on the differences in reporting frequency on goodwill between the two time periods ($\chi^2=67.71$, p-value = 0.000).

Hypothesis 4, which states that reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill, is supported by the outcomes of time period 1997-2000, where relative goodwill amounts when companies do report on intangible assets are compared with

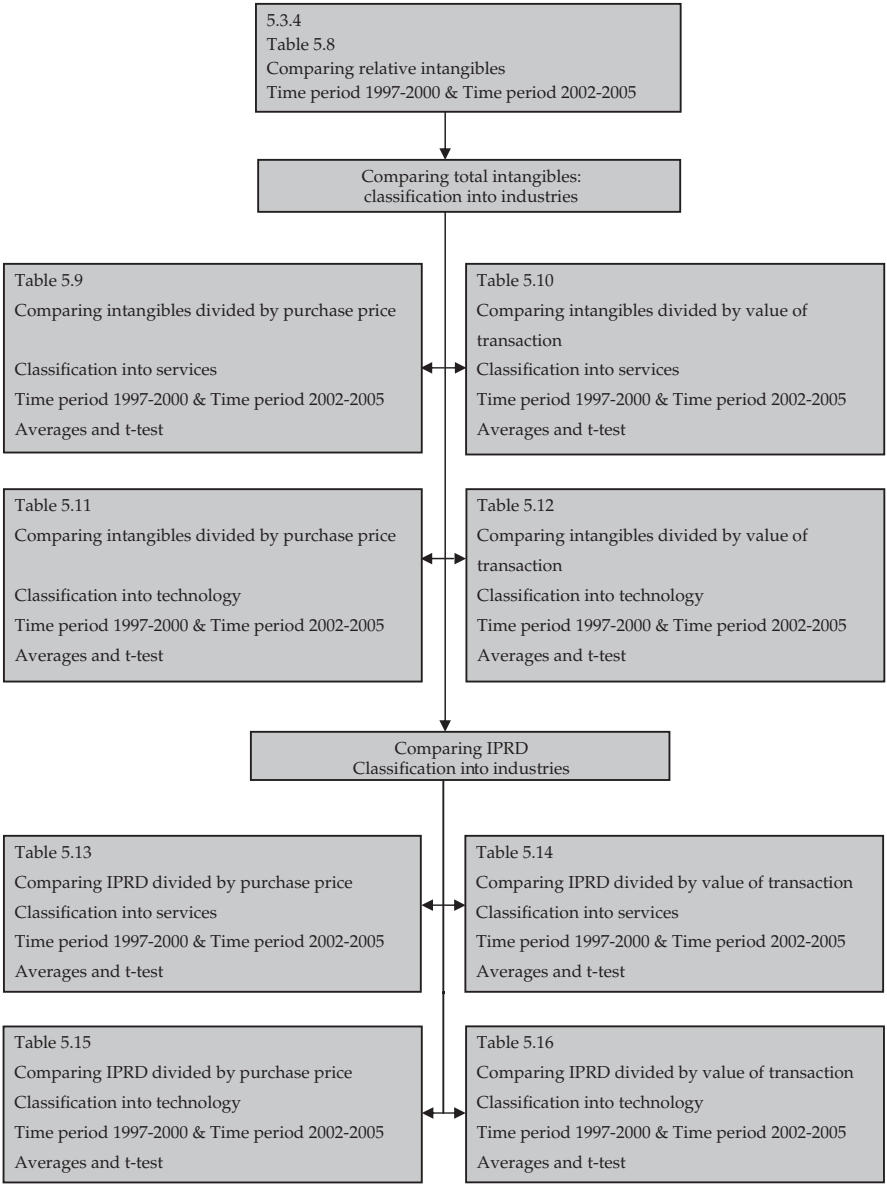


Figure 5-II : Comparing intangibles: structure of the t-test research

the relative goodwill amounts when companies do not do so. *No support* for this hypothesis can be found on the basis of the outcomes of the *time period* 2002-2005. However, this may indicate that the clearer and stricter regulations regarding entering intangibles as assets result in actual reporting on intangible assets when they are there. This implies that under new regulation, the absence of intangibles no longer seems to result in higher goodwill.

5.3.4 In-depth analysis of separate reporting on intangibles

From section 5.3.3 it emerges that new regulation on intangible assets has led to more frequent reporting on separate intangibles. However, the contents of the intangible assets reported as well as their relative amounts between the two time periods have not been compared yet. This section focuses on separate reporting on intangibles by the acquiring companies in more detail. It is tested whether the new regulation regarding reporting on intangible assets results in substantive changes in reporting for acquired intangibles apart from the reporting rate. Do the more elaborate rules regarding reporting on intangible assets lead to an increase of relative amounts of intangibles accounted for in the time period 2002-2005 when compared to 1997-2000? Or do they result in more stringent reporting on acquired intangibles and consequently lower relative amounts? Several two-tailed t-tests are performed to examine the differences in amounts of intangible assets, taking into account the industries the acquisitions are in. Further, special attention is drawn to some differences regarding the contents of the intangibles in the two time periods. The structure of the t-test research into intangibles can be found in Figure 5-II.

Table 5-8 presents information on relative amounts of the total of reported intangible assets. It appears that in the time period 1997-2000, of the 222 acquirers¹⁵⁴ reporting purchased goodwill only 117 separately reported acquired intangible assets, but that the relative amounts of the totals of acquired intangible assets are much higher when compared to those in time period 2002-2005. In 1997-2000 the relative amounts of reported intangibles added to 33 percent of the purchase price and also 33 percent of the transaction value. In the time period 2002-2005, 232 of the 266 acquirers mentioning purchased goodwill also reported other intangibles. The relative amounts of these intangible assets were about 26 percent of the purchase price and 27 percent of the transaction value, which is significantly lower when compared to 1997-2000 ($p=0.017$, and $p=0.042$, respectively). Two items that stood out and therefore are highlighted in this research are the items acquired workforce and IPRD. A remarkable finding is that in the time

154 See Table 4-2.

period 1997-2000, 30 percent¹⁵⁵ of the companies reporting acquired intangible assets inform of acquired workforce, while this is never mentioned in 2002-2005 and not allowed under new regulation either. Furthermore, in the time period 1997-2000, the item IPRD is more frequently referred to as an acquired intangible asset: 64 percent (75) of the 117 companies separately reporting acquired intangible assets note this asset, whereas in 2002-2005 in only 32 percent (74) of the 232 cases mentioning intangible assets is IPRD specifically noted. Moreover, larger amounts are involved. In the time period 1997-2000, IPRD on average amounted to 19 percent of the purchase price and of the transaction value, while in 2002-2005 this relative amount, when reported, on average amounted to about 9 percent. The relatively lower percentage of reported IPRD and, when reported, the lower relative amounts in time period 2002-2005 (significant at the 1 percent level) may be due to more unified rules regarding reporting on IPRD, stating that IPRD is only to be entered as an asset when it has reached its development phase

Table 5-9 to Table 5-12 show that the conclusion on relatively fewer but higher amounts of relative total intangibles reported in time period 1997-2000 remains after controlling for the industries the acquisitions are in. The differences in relative amounts hold when classifying the acquisitions into services and technology, although the differences turn out to be significant only for the no-services industries and for the no-technology industries.

Both Table 5-9 and Table 5-10 compare relative intangibles amounts in the two time periods when classified into services. In Table 5-9 relative amounts are derived by dividing the intangibles by the purchase price of the acquisition. Table 5-10 is about the intangibles divided by the value of transaction. Regarding the no-services industries, the results show significantly lower relative intangibles amounts in time period 2002-2005 when compared to time period 1997-2000. The corresponding p-values are 0.013 and 0.064. The results further show that in the time period 1997-2000, intangibles divided by the purchase price are significantly higher for acquisitions in the no-services industry when compared to acquisitions in the services industry ($p=0.017$). This trend of higher relative amounts of intangibles in the no-services industry is also evident for time period 2002-2005, and also occurs in both time periods when the intangibles are divided by the transaction value, although in these cases the differences are not statistically significant.

155 35 out of 117 companies.

Table 5-8: Comparing relative intangibles amounts in the different time periods: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
Total intangibles			
Total intangibles divided by purchase price	0.329 (0.026) <i>117</i>	0.264 (0.014) <i>232</i>	t=2.408** ρ=0.017
Total intangibles divided by transaction value	0.325 (0.025) <i>117</i>	0.269 (0.015) <i>232</i>	t= 2.044** ρ= 0.042
Workforce			
Workforce divided by purchase price	0.024 (0.024) <i>35</i>	--	--
Workforce divided by transaction value	0.024 (0.028) <i>35</i>	--	--
IPRD			
IPRD divided by purchase price	0.186 (0.026) <i>75</i>	0.096 (0.020) <i>74</i>	t=2.788*** ρ=0.003
IPRD divided by transaction value	0.193 (0.028) <i>75</i>	0.095 (0.020) <i>74</i>	t=2.814*** ρ=0.003

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 349 of these observations reported on intangible assets. In 117 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased intangible assets. Of these 117 acquisitions, in 35 cases information was provided on purchased workforce, and in 75 cases on purchased IPRD. In the time period 2002-2005, in 232 of the 266 acquisitions information was provided on purchased intangible assets. 74 of them reported on purchased IPRD. In this table, the differences between relative intangible assets amounts and relative IPRD amounts in the two time periods are tested. Relative amounts are derived by dividing the amounts of total intangibles, workforce and IPRD by (1) the purchase price, and (2) the value of transaction of the acquisition. The table reports on relative amounts of total intangibles, workforce and IPRD, classified in the different time periods, in parentheses the standard errors (in case of workforce the standard deviation), and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of total intangibles and the relative amounts of IPRD between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased intangible assets, IPRD, workforce and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Table 5-9: Comparing intangibles divided by purchase price in the different time periods when classified into (a) no services and (b) services: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
Intangibles divided by purchase price			
(a) no services	0.375 (0.032) <i>75</i>	0.284 (0.021) <i>128</i>	t = 2.494** ρ = 0.013
(b) services	0.246 (0.043) <i>42</i>	0.239 (0.017) <i>104</i>	t = 0.173 ρ = 0.863
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	t = 2.426** ρ = 0.017	t = 1.612 ρ = 0.108	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 349 of these observations reported on intangible assets. In 117 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased intangible assets. In the time period 2002-2005, in 232 of the 266 acquisitions information was provided on purchased intangible assets.

In this table, the differences between relative intangible assets amounts are tested when classified into services. Relative amounts are derived by dividing the amounts of intangibles by the purchase price. The table reports on relative amounts of total intangibles classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased intangible assets and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Table 5-10: Comparing intangibles divided by transaction value in the different time periods when classified into (a) no services and (b) services: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
Intangibles divided by transaction value			
(a) no services	0.356 0.031 75	0.287 (0.022) 128	t = 1.861* ρ = 0.064
(b) services	0.269 0.042 42	0.247 (0.019) 104	t = 0.569 ρ = 0.570
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	t = 1.656 ρ = 0.101	t = 1.390 ρ = 0.166	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 349 of these observations reported on intangible assets. In 117 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased intangible assets. In the time period 2002-2005, in 232 of the 266 acquisitions information was provided on purchased intangible assets.

In this table, the differences between relative intangible assets amounts are tested when classified into services. Relative amounts are derived by dividing the amounts of intangibles by the value of transaction. The table reports on relative amounts of total intangibles classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased intangible assets and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Table 5-11 and Table 5-12 show the outcomes of a comparable test, but with a classification into technology. With regard to the no-technology industries, the results show significantly lower relative amounts of intangible assets in the time period 2002-2005 when compared to 1997-2000: $p=0.000$ and $p=0.001$ respectively. Regarding the acquisitions of targets in the technology industries, no significant differences between the time periods can be found. Moreover, Table 5-11 and Table 5-12 show that in time period 1997-2000 both measures of relative intangibles are significantly higher for acquisitions in the no-technology industry compared to acquisitions in the technology industry (both p -values are 0.000). The same pattern is observed for time period 2002-2005, although then the differences are much smaller and not significant.¹⁵⁶

Table 5-11: Comparing intangibles divided by purchase price in the different time periods when classified into (a) no technology and (b) technology: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
Intangibles divided by purchase price			
(a) no technology	0.478 (0.049) <i>47</i>	0.271 (0.024) <i>104</i>	$t = 4.286^{***}$ $p = 0.000$
(b) technology	0.228 (0.022) <i>70</i>	0.258 (0.016) <i>128</i>	$t = -1.117$ $p = 0.266$
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	$t = 5.215^{***}$ $p = 0.000$	$t = 0.468$ $p = 0.640$	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 349 of these observations reported on intangible assets. In 117 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased intangible assets. In the time period 2002-2005, in 232 of the 266 acquisitions information was provided on purchased intangible assets.

*In this table, the differences between relative intangible assets amounts are tested when classified into technology. Relative amounts are derived by dividing the amounts of intangibles by the purchase price. The table reports on relative amounts of total intangibles classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.*

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased intangible assets and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

¹⁵⁶ Although in the first instance it might be expected that acquisitions in technology industries show the highest relative amounts of purchased intangibles, this also might hold true for acquisitions in no-technology industries. Examples of no-technology industries are pharmaceutical companies and chemical companies. Those companies might show relatively high IPRD amounts or amounts of patents and licenses. Therefore, the results are not remarkable. A more refined industry classification may provide relevant information on this issue.

As discussed before, Table 5-8 shows that when compared to time period 2002-2005 in time period 1997-2000 IPRD is more frequently referred to as an acquired intangible asset and that larger relative IPRD amounts are involved. Table 5-13, Table 5-14, Table 5-15, and Table 516 demonstrate that these differences in numbers and amounts also hold after controlling for the industries the acquisitions are in.

Table 5-12: Comparing intangibles divided by transaction value in the different time periods when classified into (a) no technology and (b) technology: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
Intangibles divided by transaction value			
(a) no technology	0.436 (0.047) <i>47</i>	0.276 (0.025) <i>104</i>	t = 3.279*** ρ = 0.001
(b) technology	0.250 (0.025) <i>70</i>	0.263 (0.017) <i>128</i>	t = -0.467 ρ = 0.641
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	t = 3.836*** ρ = 0.000	t = 0.438 ρ = 0.662	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 349 of these observations reported on intangible assets. In 117 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased intangible assets. In the time period 2002-2005, in 232 of the 266 acquisitions information was provided on purchased intangible assets.

In this table, the differences between relative intangible assets amounts are tested when classified into technology. Relative amounts are derived by dividing the amounts of intangibles by the value of transaction. The table reports on relative amounts of total intangibles classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods.

Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased intangible assets and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

In Table 5-13 and Table 5-14, relative amounts of IPRD in the different time periods are compared when classified into no services and services. Whereas in Table 5-13 relative amounts of IPRD are derived by dividing IPRD by the purchase price of the acquisition, in Table 5-14 relative IPRD amounts are calculated as IPRD divided by the value of the transaction. Both tables show that for the services industries, these relative IPRD amounts were significantly higher in time period 1997-2000 when compared to 2002-2005: p=0.028 and p=0.017 respectively. Similar results are observed for the no-services industries, although here the differences in relative IPRD amounts between the time periods were only significant at the 10 percent

level: $p=0.057$ and $p=0.071$ respectively. For both time periods it also appears that relative IPRD amounts in the no-services industries are significantly higher than relative IPRD amounts in the services industries.

Table 5-13: Comparing IPRD divided by purchase price in the different time periods when classified into (a) no services and (b) services: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
IPRD divided by purchase price			
(a) no services	0.241 (0.036) 43	0.146 (0.034) 40	$t = 1.931^*$ $p = 0.057$
(b) services	0.113 (0.034) 32	0.036 (0.009) 34	$t = 2.255^{**}$ $p = 0.028$
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	$t = 2.527^{**}$ $p = 0.014$	$t = 2.942^{***}$ $p = 0.004$	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 149 of these observations reported on purchased IPRD. In 75 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased IPRD. In the time period 2002-2005, in 74 of the 266 acquisitions information was provided on purchased IPRD.

In this table, the differences between relative IPRD amounts are tested when classified into services. Relative amounts are derived by dividing the amounts of IPRD by the purchase price. The table reports on relative amounts of IPRD classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively. Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased IPRD and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Table 5-15 and Table 5-16 compare relative amounts of IPRD in the different time periods when classified into no technology and technology. Relative amounts are derived by dividing IPRD by the purchase price for the acquisition (Table 5-15) and the transaction value (Table 5-16) respectively. The outcomes show that regarding acquisitions of targets from technology industries, the outcomes remain unchanged: both tables show significantly higher relative IPRD amounts for the time period 1997-2000 when compared to 2002-2005: the corresponding p-values are both 0.001. In the no-technology industries, the differences of relative IPRD amounts between the time periods are not significant.

Table 5-14: Comparing IPRD divided by transaction value in the different time periods when classified into (a) no services and (b) services: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
IPRD divided by transaction value			
(a) no services	0.240 (0.039) 43	0.142 (0.035) 40	t = 1.831* ρ = 0.071
(b) services	0.130 (0.036) 32	0.040 (0.010) 34	t = 2.451** ρ = 0.017
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	t = 1.978* ρ = 0.052	t = 2.597** ρ = 0.011	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 149 of these observations reported on purchased IPRD. In 75 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased IPRD. In the time period 2002-2005, in 74 of the 266 acquisitions information was provided on purchased IPRD.

In this table, the differences between relative IPRD amounts are tested when classified into services. Relative amounts are derived by dividing the amounts of IPRD by the value of transaction. The table reports on relative amounts of IPRD classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased IPRD and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

The outcomes of Table 5-15 and Table 5-16 further indicate that regarding acquisitions of no-technology industries, IPRD represents a relatively larger part of the total money involved in the acquisition when compared to acquisitions of technology industries (all four t-tests are significant at a 1 percent level, $p=0.000$). This is not surprising as, among others, pharmaceutical businesses and (petro)chemical industries also belong to the no-technology industries. A more refined industry classification may provide relevant information on this issue.

Table 5-15: Comparing IPRD divided by purchase price in the different time periods when classified into (a) no technology and (b) technology: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
IPRD divided by purchase price			
(a) no technology	0.322 (0.056) 26	0.251 (0.060) 19	t = 0.851 ρ = 0.400
(b) technology	0.115 (0.020) 49	0.042 (0.009) 55	t = 3.447*** ρ = 0.001
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	t = 4.195*** ρ = 0.000	t = 5.513*** ρ = 0.000	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 149 of these observations reported on purchased IPRD. In 75 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased IPRD. In the time period 2002-2005, in 74 of the 266 acquisitions information was provided on purchased IPRD.

In this table, the differences between relative IPRD amounts are tested when classified into technology. Relative amounts are derived by dividing the amounts of IPRD by the purchase price. The table reports on relative amounts of IPRD classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively. Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased IPRD and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

In summary, as compared to acquiring companies in the time period 2002-2005, in 1997-2000 only a limited number of acquiring companies recognize intangible assets other than purchased goodwill. However, as soon as intangible assets are reported, relative amounts are higher when compared to 2002-2005. Furthermore, some of the recorded items in the time period 1997-2000 are not allowed (workforce) or are restrained by the new regulation (IPRD). Results indicate that regulation seems to have brought more consistency in separate reporting on intangible assets. Further, it seems that regulation has brought more consistency in separate reporting on intangible assets.

Table 5-16: Comparing IPRD divided by transaction value in the different time periods when classified into (a) no technology and (b) technology: averages and t-test

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I – II (Ha: diff > 0 or diff < 0)
IPRD divided by transaction value			
(a) no technology	0.328 (0.063) 26	0.243 (0.066) 19	t = 0.919 ρ = 0.363
(b) technology	0.121 (0.021) 49	0.044 (0.009) 55	t = 3.562*** ρ = 0.001
Difference average value (a) – (b) (Ha: diff > 0 or diff < 0)	t = 3.843*** ρ = 0.000	t = 4.872*** ρ = 0.000	

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001). 149 of these observations reported on purchased IPRD. In 75 of the 222 acquisitions that were announced and became effective in the time period 1997-2000, information was provided on purchased IPRD. In the time period 2002-2005, in 74 of the 266 acquisitions information was provided on purchased IPRD.

In this table, the differences between relative IPRD amounts are tested when classified into technology. Relative amounts are derived by dividing the amounts of IPRD by the value of transaction. The table reports on relative amounts of IPRD classified in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations. It shows the t-statistics and the p-values of the differences between the relative amounts of intangibles between the two time periods. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on purchased IPRD and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

5.3.5 Combined effect of characteristic on goodwill

In order to further assess the effect of new regulation on the relative amounts of purchased goodwill, also the combined effects of regulation and separate reporting on intangible assets and industries on purchased goodwill are to be tested. Therefore, regressions of the relative amounts of goodwill are performed on these characteristics. Regression analyses 1 and 3 of Table 5-17 show the results of the regressions of relative goodwill 1 and 2 on regulation, reporting on other intangible assets and, as control variables, classification into services and technology. Relative goodwill 1 then turns out to be significantly negative determined by the presence of intangible assets and significantly positive by the classification of the industries into services. In addition to these characteristics, relative goodwill 2 is also positively influenced by the classification of the industries into technology and negatively by the dummy for regulation. In the regression of relative

goodwill 1, the significant effect of the time period (and thus regulation) on the relative size of goodwill fades away, and the positive effect of the classification of the industries into technology is only significant at the 10 percent level.

However, it is likely that interactions between certain characteristics exist. For example, an interaction between the time period of the acquisitions and separate reporting on intangibles is plausible, since the new regulation is accompanied by stringent guidelines with regard to intangible assets. Further, interaction between the classifications of industries into technology and services is plausible.

Regression analyses 2 and 4 of Table 5-17 represent the results of the regressions of relative goodwill 1 and 2 on the characteristics, when two interaction variables are taken into consideration: one for interaction between industry classifications and the other for interaction between the time period and reporting on intangible assets apart from goodwill. After controlling for this interaction between variables, the impact of regulation (as represented by a time period dummy) becomes significant and negative. From regression analysis 2, it turns out that relative goodwill 1 is positively affected by a classification into services, positively by a classification into technology and negatively by reporting on other intangible assets. This is in line with expectations, although surprisingly the time period dummy does not become significant here. In regression analysis 4, where the same regression is performed but now using relative goodwill 2, alongside the other characteristics regulation again turns out to have a negative impact on the relative amount of goodwill. All significances have increased.

In all four regressions, adjusted R^2 is low (<0.08) although not exceptionally so. However, this implies that more factors need to be taken into account when explaining goodwill.

Table 5-17: Regressions of goodwill on explanatory variables

	(1)	(2)	(3)	(4)
REGRESSION COEFFICIENT	Relative goodwill 1	Relative goodwill 1	Relative goodwill 2	Relative goodwill 2
D_{timeperiod}	-0.038	-0.093	-0.070**	-0.209***
	(-1.30)	(-1.60)	(-2.04)	(-3.03)
D_{services}	0.125***	0.163***	0.149***	0.190***
	(4.30)	(3.86)	(4.34)	(3.81)
D_{technology}	0.057*	0.085**	0.082**	0.113***
	(1.93)	(2.31)	(2.33)	(2.60)

	(1)	(2)	(3)	(4)
REGRESSION COEFFICIENT	Relative goodwill 1	Relative goodwill 1	Relative goodwill 2	Relative goodwill 2
$D_{\text{services}} * D_{\text{technology}}$		-0.074		-0.082
		(-1.28)		(-1.20)
$D_{\text{intangible assets}}$	-0.125***	-0.155***	-0.097**	-0.165***
	(-3.64)	(-3.71)	(-2.38)	(-3.36)
$D_{\text{timeperiod}} * D_{\text{intangible assets}}$		0.076		0.186**
		(1.13)		(2.34)
Constant	0.658***	0.664***	0.650***	0.676***
	(24.16)	(1.13)	(20.12)	(18.56)
Number of observations	488	488	488	488
F-statistic	9.70	21.53	9.37	7.45
p-value	0.000	0.000	0.000	0.000
Adjusted R ²	0.0667	0.0683	0.0643	0.0736

The sample comprises 488 observations of acquisitions that were announced and became effective in the time period 1997-2005 (except for the year 2001): 222 acquisitions were announced and became effective in the time period 1997-2000, and 266 acquisitions were announced and became effective in the time period 2002-2005. All acquisitions report on purchased goodwill, value of transaction, and purchase price. Two different dependent variables are used: relative goodwill 1, representing goodwill divided by the purchase price of the acquisition, and relative goodwill 2, defined as goodwill divided by the transaction value of the acquisition. $D_{\text{timeperiod}}$ represents a dummy variable set to one if the acquisition is announced and effective in the time period 2002-2005. D_{services} is a dummy variable set to one if the target company is in the services industry. $D_{\text{technology}}$ refers to a dummy variable set to one if the target company is in the technology industry. $D_{\text{intangible assets}}$ is a dummy variable set to one if the acquiring company reports on acquired intangible assets. $D_{\text{services}} * D_{\text{technology}}$ is an interaction variable set to one if target is in the services industry and in the technology industry. $D_{\text{timeperiod}} * D_{\text{intangible assets}}$ is an interaction variable set to one if the acquisition is announced and effective in the time period 2002-2005 and if the acquiring company reports on acquired intangible assets. The table reports OLS regression coefficient estimates and, in parentheses, t-statistics. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively. Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill, intangible assets and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

In conclusion, when considering the combined effect of the characteristics on goodwill, *hypothesis 4*, stating that “reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill” is supported by all regressions. The outcomes of the regressions of relative goodwill 2 provide evidence for *hypothesis 2*, stating that “new regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition”. However, *hypothesis 2* is not supported by regressions of relative goodwill 1.

Sensitivity analyses

To check the robustness of the analyses, some extra regression analyses were carried out, using the logarithm of relative goodwill as a different specification for the dependent variable relative goodwill. A log-specification does have the advantage of correcting (part of) possible heteroscedasticity. Regressions of the logarithm of relative goodwill on the explanatory variables provide similar results, indicating that there is no improvement or deterioration in the effect of the explanatory characteristics on relative goodwill then. In other words, a linear specification seems to be as reliable as a non-linear specification in explaining relative goodwill. The adjusted R^2 with these logistic regressions are slightly lower. The outcomes of the regressions of the logarithm of goodwill are available from the author on request.

5.4 CONCLUSIONS

This study examines whether changes in the reporting on mergers and acquisitions in the US due to new regulation have led to more and more precise information about goodwill in the financial statements of the acquirers, and if the informative value of goodwill is thereby improved. If the new measures have had the desired effect, goodwill should have become a more concise concept. As a result, the percentage of goodwill included in the purchase price or transaction value should become less. In this study, acquisitions between the US stock exchange listed companies were studied. Of these acquisitions, purchased goodwill in the period after the introduction of the new rules (2002-2005) was compared with purchased goodwill in the previous period (1997-2000).

The results show, in line with the expectations, that in the period after the introduction of new regulation the relative amount of goodwill is lower when compared to relative goodwill in the period before. Even if corrections were made for target industries by classifying them into services and into technology,¹⁵⁷ these findings remained the same. These research results support hypothesis 2.

Moreover, the outcomes from the time period 1997-2000, where relative goodwill amounts of companies that do report on intangible assets are compared with relative goodwill amounts of companies that do not, indicate that separate disclosure of intangible assets negatively affected the amount of goodwill, which provides evidence for hypothesis 4. No support for this

157 In line with distinguishing “old economy” industries from “new economy” industries. Whereas old economy industries mainly contain (old) industrial companies, new economy industries consist of high technology companies and of companies from the services industry. The amount of purchased goodwill is expected to be higher in the case of acquisitions of companies in new economy industries. See also section 5.2.

hypothesis can be found on the basis of the outcomes from the time period 2002-2005. However, this may indicate that the clearer and stricter the regulations regarding entering intangibles as assets, the more likely this will result in actual reporting on intangible assets when they are there. This implies that under new regulation, the absence of intangibles no longer seems to result in higher goodwill.

Compared to acquiring companies in time period 2002-2005, in 1997-2000 only a limited number of acquiring companies recognize intangible assets other than purchased goodwill. This finding *provides evidence for hypothesis 3*. However, as soon as intangible assets are reported, relative amounts of these intangible assets are higher in the time period 1997-2000 when compared to 2002-2005. Results further show that some of the recorded items in the time period 1997-2000 are not allowed (workforce) or are restrained by the new regulation (IPRD). Results indicate that regulation seems to have brought more consistency in separate reporting on intangible assets.

The analysis of the impact of the combined effect of the time period, the presence of intangible assets and, as control variables, industry classifications into services and technology on goodwill shows that when performing regressions of relative goodwill 2, both without and with corrections made for interaction variables, the new regulations and the related reporting on other intangible assets negatively influence goodwill. When performing the regressions of relative goodwill 1, the impact of new regulations on goodwill fades away.

These outcomes *provide evidence for hypothesis 4*. In addition, relative goodwill 2 outcomes *support hypothesis 2*.

The above-mentioned results indicate that the changes in regulation had a powerful influence on the reporting of purchased goodwill. Goodwill has become a more concise concept.

The results may indicate that the new regulation has brought accounting goodwill and economic goodwill closer together. Further research on goodwill in the period after the introduction of the new regulation is necessary: Can this goodwill be used as a new measure of value creation of acquisitions, alongside more conventional measures such as stock excess returns on equity and return on equity? This will be examined in chapter 6.



6 Goodwill measuring value creation of acquisitions: an empirical research

6.1 INTRODUCTION

In chapter 5, “old” goodwill under Opinion no. 16 and 17 was compared to “new” goodwill under SFAS 141 and 142. The results show relatively lower goodwill numbers under the new accounting regime, which indicates that under the new regulation goodwill may have become a more concise term. Therefore, the research in chapter 6 further concentrates on goodwill under the new accounting regulation. The focus of this research is on goodwill as a measure of value creation: hypotheses about creation of value by mergers are tested on purchased goodwill.

Accordingly, this chapter addresses the *second research question* (see also sections 1.2 and 3.5.2):

- (II) Does goodwill under the new accounting regime provide information on expected value creation of the acquisition?

The underlying theory to be tested is the *efficiency theory*, claiming that merger bids are initiated by managers attempting to create value. The efficiency theory states that the new combination is more productive than the sum of its parts, due to operating and financial synergy gains and to improved managerial effectiveness of the target company. Goodwill may represent these expected synergies and management improvement, as acquiring companies are prepared to pay for the expected value creation caused by them. Earlier research testing the efficiency theory on target returns and bid premiums serves as a basis for this study, as it is assumed that goodwill moves in line with them.

This is where *sub-question (II) a* is answered (see also sections 1.2 and 3.5.2):

- (II) a What is the effect of the characteristics of the efficiency theory on purchased goodwill under the new accounting regime?

In accordance with the efficiency theory, in this chapter it is tested whether purchased goodwill flows from operating and financial synergies and from improved management. Mergers and acquisitions involved in this research became effective in the time period 2002-2005, thus after new US regulation affecting reporting on purchased goodwill came into force.

As earlier mentioned in section 3.5.2, the corresponding hypotheses¹⁵⁸ to be tested in this chapter are:

- Hypothesis 5: The more operating synergy that emerges from the acquisition, the higher the amount of purchased goodwill will be.
- Hypothesis 6: Financial synergy resulting from an acquisition positively influences the amount of purchased goodwill.
- Hypothesis 7: If target's management improves by the acquisition, a higher amount of purchased goodwill is paid.

When explaining goodwill from value creation, other explanations for purchased goodwill also have to be taken into account. The *empire-building theory* states that acquisitions are planned and executed by the managers of the buyer's company, in order to maximize their own utility instead of shareholder value. Due to empire-building, acquiring companies are prepared to overpay for the acquisition, and purchased goodwill may represent this overpayment. Other determinants that may influence the amount of purchased goodwill consider the *bargaining position* of the acquiring company and the target. When explaining goodwill from value creation, these other explanations are taken into account.¹⁵⁹ It is tested whether hypotheses 5 to 7 hold after controlling for characteristics of these other explanations for purchased goodwill.

This chapter is ordered as follows. Section 6.2 contains an explanation of the model. Section 6.3 shows the results of the research. Finally, conclusions are drawn in section 6.4.

6.2 MODEL

The research into goodwill measuring value creation of acquisitions after new regulation affecting reporting on purchased goodwill¹⁶⁰ came into force is carried out in three steps. *First*, correlations of purchased goodwill with

158 These hypotheses are research hypotheses (experimental hypotheses), which display the predicted effect (H1). All of these hypotheses have corresponding null hypotheses (H0) concerning the reverse possibilities. The axioms of the statistical research in chapter 6 are the reverse null hypotheses. In the research it is tested whether or not the null hypotheses are rejected and thereafter whether or not corresponding research hypotheses are supported (Field, 2005, 23, and Aron et al., 2008, 148-149).

159 Earlier research that tested the empire-building theory and the effect of the bargaining position on target returns and bid premiums serves as a basis for this control study.

160 The results show relatively lower goodwill numbers under the new accounting regime, indicating that under new regulation, goodwill has become a more concise term. This is why the research on goodwill as a measure of value creation further concentrates on goodwill under the new accounting regulation regarding business combinations and intangible assets.

stock excess returns are performed. *Second*, bivariate analyses regarding correlations between purchased goodwill and characteristics of value-creating acquisitions as well as other characteristics affecting goodwill are carried out. *Third*, multivariate regressions of purchased goodwill are performed on these characteristics.

The focus of the research in this chapter is on observations in the time period 2002-2005, thus after new regulation came into force. Information on data and descriptives for this research is found in chapter 4: Table 4-2 summarizes the composition of the sample of mergers and acquisitions used for this research. Table 4-3 explains the number of observations available for this sample from CRSP and Compustat. Table 4-4, Table 4-5, and Table 4-6 further clarify the descriptives used in this research. Calculations of stock excess returns are expounded in the appendix to chapter 4.

6.2.1 Correlations between goodwill and stock excess return amounts

First, the relationship between goodwill and value creation of acquisitions is examined by correlating purchased goodwill to stock excess returns surrounding the acquisition announcement. In literature, stock excess returns are widely used as a criterion of value creation of the company.¹⁶¹ In section 6.3.1 of this research it is measured how purchased goodwill amounts are associated with targets' excess return amounts, acquirers' excess return amounts, and combined stock excess return amounts respectively.

The corresponding expression is as follows.

$$\rho(\text{goodwill}, \text{excess return amount}_x)$$

Here x stands for target, acquirer, or combination of target and acquirer.

In order to convince target shareholders to sell their shares to the acquiring company, share premiums need to be paid. Consequently, target stock excess return amounts are expected to be positive numbers. When acquiring companies aim at value-creating acquisitions and benefiting their own shareholders, the acquirers' excess return amounts surrounding the acquisition announcement are positive numbers, or at least add to zero, depending on the bargaining position of acquirer and target. The resulting combined stock excess return amounts are positive numbers. The moment the combined stock excess return amounts turn into negative numbers, business combinations are destructing value.

¹⁶¹ See section 3.4 and section 3.5 for more details about the state of the art of research into acquisition theories in which excess returns are used as a criterion of value creation of the acquisition.

It follows that correlation coefficients between purchased goodwill and target stock excess return amounts are expected to be positive. The signs of the correlation coefficients between purchased goodwill and acquirer stock excess return amounts and between purchased goodwill and combined stock excess return amounts are uncertain.

Positive signs or insignificant signs¹⁶² in the case of the correlation between goodwill and acquirer excess amounts are first indicators of relationships between goodwill and value creation of acquisitions. Regarding the correlation between purchased goodwill and acquirer or combined stock excess returns, negative signs point to relationships between goodwill and overpayment for acquisitions.

Correlations of goodwill and excess returns are performed for different event periods, varying from the day of the acquisition announcement ($t=0$) to an event period window of eleven days, starting from five days before the announcement and lasting until five days after ($t=-5, +5$).

Background information on the stock excess returns, as well as on their calculations and on their significances, can be found in Table 4-5, in section 4.3.2, and in the appendix to chapter 4.

6.2.2 Correlations between relative goodwill and explanatory variables

Second, bivariate analyses between relative goodwill, characteristics indicating value-creating acquisitions, and other characteristics affecting purchase price and goodwill are carried out. This analysis gives an impression of the extent of the explanatory variables when explaining goodwill.¹⁶³

The corresponding expression reads as follows.

$$\rho(\text{relative goodwill}, X_i)$$

Here X_i resembles the explanatory characteristics for goodwill.

For the sake of completeness with regard to characteristics represented by dummy variables, not only correlation analyses but also t-tests are performed.

Characteristics that are to be distinguished, and, between brackets, the sign of their expected correlations with relative goodwill amounts, are, regarding the efficiency theory:

162 Bargaining factors may turn the correlation coefficient between purchased goodwill and acquirer stock excess returns into insignificance.

163 However, they will not provide information on cause and effect. Furthermore, it cannot report on whether these connections also hold in combination with other characteristics.

- characteristics of operating synergies, represented by the relatedness of businesses of acquiring and target company (+), and by the relative size of the target company to the acquiring company (-);
- characteristics of financial synergies, represented by the difference between the debt-assets ratios of the target company and the acquiring company (+);
- characteristics of improved management, represented by acquiring company's Tobin's q (+), and target's company Tobin's q (-).

Other characteristics that are taken into account are:

- characteristics of empire-building, represented by the acquiring company's debt-assets ratio (-), and the percentage of shares owned by the executives of the acquiring company (-);
- characteristics of other factors, representing the source of financing (+ in case of cash financing), and the form of the acquisition (+ in case of tender offer).

These characteristics originate from the literature study in chapter 3 and are summarized in Table 3-4 (characteristics from the efficiency theory), and Table 3-5 (characteristics derived from other theories). More details on the explanatory characteristics are found in Table 4-6 and in section 4.3.2.

The results of the bivariate analyses are shown in section 6.3.2.

6.2.3 Multivariate analyses

Third, in section 6.3.3 multivariate analyses are carried out by performing multivariate regressions of purchased goodwill on characteristics indicating value-creating acquisitions, both with and without control variables for other characteristics. In the multivariate analyses three groups of regression models are used:

- (I) Models of goodwill as a measure of value creation explained from the efficiency theory (models 1 to 3);
- (II) Models of goodwill explained from the empire-building theory and bargaining (model 4 and model 5);
- (III) The final model of goodwill as a measure of value creation explained from the efficiency theory controlling for empire-building and bargaining, representing the general model 6.

To control for effects on goodwill by the industry the target is in, all models include an industry dummy, classifying the target companies into services industries ($D=1$) and other industries ($D=0$).¹⁶⁴

¹⁶⁴ See chapter 4, section 4.3.1.2, and chapter 5, section 5.2 for a further explanation of this classification.

The corresponding expression is as follows.

relative goodwill = *f* (*efficiency theory, empire-building theory, bargaining, industry*)

I. Goodwill explained from the efficiency theory

Regarding equations explaining goodwill as a measure of value creation without control effects, three models are available:

Model 1 explaining goodwill from operating synergies;

Model 2 explaining goodwill from financial synergies, and

Model 3 explaining goodwill from improved management.

The characteristics of operating synergies, financial synergies and improved management were derived from the literature study in chapter 3 and are summarized in Table 3-4. More details on these explanatory characteristics are mentioned in Table 4-6 and in section 4.3.2.

Model 1 contributes to answering hypothesis 5, which states that “The more operating synergy that emerges from the acquisition, the higher the amount of purchased goodwill will be.” Relatedness of business and relative size of the target to the acquirer are viewed as indicators of operating synergies: relatedness of business is expected to create value, whereas it is expected that relative size is negatively related to value creation.

MODEL 1: OPERATING SYNERGY

$$relative_goodwill = \beta_0 + \beta_1 * D_{same_sector} + \beta_2 * relative_size + \beta_3 * D_{target_services} + \varepsilon$$

relative_goodwill = goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;

D_{same sector} = dummy set to one if acquirer and target are in the same industry (first two digits of the four digits SIC code are the same);

relative_size = value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the fiscal year preceding the acquisition;

D_{target_services} = dummy variable set to one if the target company is in the services industry.

Model 2 responds to hypothesis 6, stating that “Financial synergy resulting from an acquisition positively influences the amount of purchased goodwill.”

The characteristic used to measure financial synergy is the difference in financial leverage between target and acquirer. This difference in financial leverage is expected to be positively related to value creation, as it is creating chances for financial synergies. Adding a quadratic term results in more flexibility to the effect of difference in financial leverage on goodwill – either an increasing or decreasing positive marginal effect. The model is as follows:

MODEL 2: FINANCIAL SYNERGY

$$\begin{aligned} \text{relative_goodwill} = & \beta_0 + \beta_1 * \text{dif_debt_assets} + \beta_2 * (\text{dif_debt_assets})^2 \\ & + \beta_3 * D_{\text{target_services}} + \varepsilon \end{aligned}$$

relative_goodwill = goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;

dif_debt_assets = the difference between the debt-assets ratios of target and acquirer;

D_{target_services} = dummy variable set to one if the target company is in the services industry.

Model 3 addresses hypothesis 7, stating that “If target’s management improves by the acquisition, a higher amount of purchased goodwill is paid.” It measures the effect of quality of acquirer’s and target’s management on relative goodwill. Quality of management is measured by Tobin’s q.¹⁶⁵ Acquisitions are classified into four groups, depending on the quality of acquirer’s and target’s management, three of which are included in the model: (a) low acquirer Tobin’s q and high target Tobin’s q, (b) high acquirer Tobin’s q and low target Tobin’s q, (c) high acquirer Tobin’s q and high target Tobin’s q, and (d) low acquirer Tobin’s q and low target Tobin’s q.¹⁶⁶ As discussed in chapter 3, it is expected that the combination of high quality acquirer’s management with low quality target’s management is most value-creating when compared to the combination of low quality target’s management with low quality acquirer’s management, the former therefore leading to the highest relative goodwill. As it is assumed that the combination

165 To check the robustness of the data, additionally some sensitivity analyses are carried out, in which alternative measures of quality of management are used. Among them are (i) the average income growth of the acquiring company, (ii) the difference of average income growth between the target company and the acquiring company, and (iii) Tobin’s q of the acquiring company and Tobin’s q of the target company (ratios instead of dummies representing combinations). More details on these additional analyses can be found in section 6.3.3.

166 One of the four groups is not included as a variable in the equation, namely the combination of low quality target’s management with low quality acquirer’s management, and therefore serves as reference point for the other three groups.

of low quality target's management with low quality acquirer's management is the least value-creating or even value-destructing, the other two combinations (low quality acquirer's management/high quality target's management and high quality acquirer's management/high quality target's management) are also expected to positively influence relative goodwill. Model 3 runs in the following order:

MODEL 3: MANAGEMENT IMPROVEMENT

$$\begin{aligned} \text{relative_goodwill} = & \beta_0 + \beta_1 * D_{\text{alow_thigh_tobin's_q}} + \beta_2 * D_{\text{ahigh_tlow_tobin's_q}} \\ & + \beta_3 * D_{\text{ahigh_thigh_tobin's_q}} + \beta_4 * D_{\text{target_services}} + \varepsilon \end{aligned}$$

relative_goodwill = goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;

$D_{\text{alow_thigh_Tobin's_q}}$ = dummy variable set to one for the combination acquirer low Tobin's q target high Tobin's q;

$D_{\text{ahigh_tlow_Tobin's_q}}$ = dummy variable set to one for the combination acquirer high Tobin's q target low Tobin's q;

$D_{\text{ahigh_thigh_Tobin's_q}}$ = dummy variable set to one for the combination acquirer high Tobin's q target high Tobin's q;

$D_{\text{target_services}}$ = dummy variable set to one if the target company is in the services industry.

II. Goodwill explained from the empire-building theory and bargaining

As found in literature, other variables might also influence the purchase price of an acquisition and therefore goodwill. Among them are agency behavior of acquirer's management and bargaining factors. The characteristics of agency behavior of acquirer's management and bargaining factors were derived from the literature study in chapter 3 and are summarized in Table 3-5. They are explained in more detail in Table 4-5 and in section 4.3.2.

Model 4 concerns the effect of acquirer's management agency behavior on relative goodwill. It measures whether management disciplining factors do limit management discretion, resulting in a lower purchase price and consequently in a lower goodwill amount. Variables involved are the debt-assets ratio of the acquirer, as debt may discipline management, and percentage of shares possessed by acquirer's management, as managerial share ownership may align managerial and shareholders' interests. The model is as follows:

MODEL 4: EMPIRE-BUILDING

$$\text{relative_goodwill} = \beta_0 + \beta_1 * \text{debt_assets_acquirer} + \beta_2 * \text{perc_shares_management_acquirer} + \beta_3 * D_{\text{target_services}} + \varepsilon$$

<i>relative_goodwill</i>	= goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;
<i>debt_assets_acquirer</i>	= debt-assets ratio acquirer end of fiscal year prior to the acquisition;
<i>perc_shares_management_acquirer</i>	= percentage of shares possessed by acquirer's management;
<i>D_{target_services}</i>	= dummy variable set to one if the target company is in the services industry.

Model 5 measures how bargaining factors might influence relative goodwill. As it is argued that the method of payment has an impact on the purchase price, two forms of payment are added to the model: percentage of cash and percentage of financing by other means than cash or stock. Stock payment serves as the reference category. It is expected that cash payments positively influence goodwill when compared to stock payments. Furthermore, it is assumed that when compared to a merger, a tender offer will have a positive impact on purchased goodwill, as all target shareholders will then receive a control premium. This results in the following model 5.

MODEL 5: BARGAINING

$$\text{relative_goodwill} = \beta_0 + \beta_1 * \text{perc_of_cash} + \beta_2 * \text{perc_of_other} + \beta_3 * D_{\text{tender_offer}} + \beta_4 * D_{\text{target_services}} + \varepsilon$$

<i>relative_goodwill</i>	= goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;
<i>perc_of_cash</i>	= percentage of cash payment for the acquisition;
<i>perc_of_other</i>	= percentage of payment for the acquisition other than cash or equity;
<i>D_{tender_offer}</i>	= dummy set to one if the acquisition is a tender offer;
<i>D_{target_services}</i>	= dummy variable set to one if the target company is in the services industry.

III. General model

All variables are gathered together in general model 6. General model 6 measures the effect of operating and financial synergies and of management improvement on relative goodwill, thereby controlling for agency and bargaining effects. General model 6 runs as follows:

GENERAL MODEL 6: GENERAL MODEL

$$\begin{aligned} \text{relative_goodwill} = & \beta_0 + \beta_1 * D_{\text{same_sector}} + \beta_2 * \text{relative_size} + \beta_3 * \text{dif_debt_assets} \\ & + \beta_4 * (\text{dif_debt_assets})^2 + \beta_5 * D_{\text{alow_thigh_tobin's_q}} + \beta_6 * D_{\text{ahigh_tlow_tobin's_q}} \\ & + \beta_7 * D_{\text{ahigh_thigh_tobin's_q}} + \beta_8 * \text{debt_assets_acquirer} \\ & + \beta_9 * \text{perc_shares_management_acquirer} + \beta_{10} * \text{perc_of_cash} \\ & + \beta_{11} * \text{perc_of_other} + \beta_{12} * D_{\text{tender_offer}} + \beta_{13} * D_{\text{target_services}} + \varepsilon \end{aligned}$$

relative_goodwill = goodwill related to (1) the purchase price or (2) the value of the transaction of the acquisition;

D_{same_sector} = dummy set to one if acquirer and target are in the same industry (first two digits of the four digits SIC code are the same);

relative_size = value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the fiscal year preceding the acquisition;

dif_debt_assets = the difference between the debt-assets ratios of target and acquirer;

D_{alow_thigh_Tobin's_q} = dummy variable set to one for the combination acquirer low Tobin's q target high Tobin's q;

D_{ahigh_tlow_Tobin's_q} = dummy variable set to one for the combination acquirer high Tobin's q target low Tobin's q;

D_{ahigh_thigh_Tobin's_q} = dummy variable set to one for the combination acquirer high Tobin's q target high Tobin's q;

debt_assets_acquirer = debt-assets ratio acquirer end of fiscal year prior to the acquisition;

perc_shares_management_acquirer = percentage of shares possessed by acquirer's management;

perc_of_cash = percentage of cash payment for the acquisition;

perc_of_other = percentage of payment for the acquisition other than cash or equity;

D_{tender_offer} = dummy set to one if the acquisition is a tender offer;

D_{target_services} = dummy variable set to one if the target company is in the services industry.

When performing the regressions of relative goodwill, two definitions of relative goodwill are used:

- goodwill divided by purchase price: relative goodwill 1;
- goodwill divided by transaction value: relative goodwill 2.

As mentioned earlier, by using these two different measures – purchase price and value of transaction, the price paid for the acquisition is considered from two different points of view: from the *financial accounting perspective* (purchase price) and from the *finance perspective* (value of transaction). This was further clarified in section 4.3.1.1.

As discussed in chapter 4, some of the variables for value creation and the control variables that flow from chapter 3 cannot be taken into consideration in this research due to a low number of relevant observations or a low frequency of certain events. Among them are the percentage of shares owned by all executives in the target company, the number of bidders for the target company, and target management's attitude to the offer.

As mentioned in chapter 4, although 239 out of 266 observations providing goodwill information¹⁶⁷ also obtain information from Compustat for both acquirer and target, Compustat information is not equally extensive for all observations. When restricting the research to observations providing information on all Compustat data necessary to compose the explanatory variables needed to perform the regressions, the number of observations is further cut down to a minimum of 108.¹⁶⁸

In this research, regressions are performed:

- (1) with the observations that provide information on the data (limited number of observations);
- (2) with all available observations, thereby correcting for missing data by means of dummy variables.¹⁶⁹

167 As discussed in footnote 148 with table 4-5, when considering the explanatory variables for this research on acquisitions in time period 2002-2005, one more observation was omitted due to inconsistent data in one of the variables. The observation showed up a percentage of shares owned by executives which was larger than 100 percent. This brings the number of the maximum number of available observations for the in-depth research to 265 instead of 266.

168 See also Table 4-3.

169 Regarding variables with missing observations, new variables are created, resembling the values of the available observations and valuing 0 when no observations are available. Each of the new variables is combined with a corresponding dummy variable reporting 1 when no observations are available and 0 elsewhere.

From the above, Table 6-1 summarizes the different regressions to be performed in this research. It shows that regressions are performed with models 1 to 6, making use of (I) two different measures of relative goodwill, (II) a limited number of observations due to missing data, and (III) the maximum number of observations, with corrections for missing data.

Table 6-1: Overview of regressions to be performed

Model	1 operating synergy	2 financial synergy	3 improved man.	4 empire building	5 bargai- ning	6 general
Relative goodwill 1						
With lower number of observations due to missing data	1a	2a	3a	4a	5a	6a
With correction for missing data	1b	2b	3b	4b	5b	6b
Relative goodwill 2						
With lower number of observations due to missing data	1c	2c	3c	4c	5c	6c
With correction for missing data	1d	2d	3d	4d	5d	6d

6.3 RESULTS

In this section, the results of the research into goodwill measuring value creation of acquisitions are discussed.

First, the outcomes of the correlations between purchased goodwill and stock excess returns surrounding the acquisition announcement are reviewed (section 6.3.1). *Subsequently*, the correlations between relative goodwill, characteristics indicating value-creating acquisitions, and other characteristics affecting purchase price and goodwill are examined (section 6.3.2). *Third*, the results of the multivariate regressions of purchased goodwill are discussed (section 6.3.3).

6.3.1 Results correlations goodwill and stock excess return amounts

Table 6-2 shows the correlation coefficients between goodwill and stock excess return amounts of the acquirer, the target, and the combination of acquirer and target.

Table 6-2: Correlation between goodwill and excess return amounts

Event period	Correlation goodwill and excess return amount target (p value)	Correlation goodwill and excess return amount acquirer (p value)	Correlation goodwill and excess return amount combination (p value)
event period (0) (one day)	0.056 (0.412)	-0.005 (0.942)	0.005 (0.945)
event period (-1, +1) (three days)	0.231*** (0.001)	-0.190*** (0.003)	-0.113 (0.105)
event period (-2, +2) (five days)	0.434*** (0.000)	-0.172*** (0.006)	-0.078 (0.263)
event period (-3, +3) (seven days)	0.682*** (0.000)	-0.409*** (0.000)	-0.298*** (0.000)
event period (-5, +5) (eleven days)	0.485*** (0.000)	-0.392*** (0.000)	-0.313*** (0.000)

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005. Of these acquisitions, 251 cases provided information about acquirer stock returns, 214 cases informed on target stock returns, and 207 cases reported on both acquirer and target stock returns.

Goodwill refers to the amount of purchased goodwill involved in the acquisition. Acquirer and target stock excess return amounts are derived by multiplying stock excess returns of the companies by their market capitalizations one day before the start of each event window. Combined stock excess return amounts are calculated by multiplying acquirer and target stock excess returns by their market capitalizations one day before the start of each event window time period. Acquirer and target stock excess returns are measured using the ordinary least squares (OLS) market model. Stock excess returns are calculated according OLS market model (parameters estimated over (-205, -6) interval, using equally weighted market index returns. The event windows used to calculate the cumulative excess returns are one-day (0), three-day (-1, +1), five-day (-2, +2), seven-day (-3, +3), and eleven-day (-5, +5) time periods, respectively. Combined stock excess returns were calculated by dividing the combined stock excess returns amount by the total market capitalization of acquirer and target one day before the start of each event window time period.

The table reports correlation coefficient estimates and, in parentheses, p-values. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively.

Source: Information on mergers and acquisitions is derived from SDC-Platinum, and information on goodwill is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Information on stock returns is provided by CRSP.

The results show that four out of five correlation coefficients of the target and acquirer stock excess return amounts with goodwill are highly significant (p -value <0.01). Only for the one-day event period are target and acquirer correlation coefficients not significant.

In the other four event periods, as expected the correlation coefficients of target stock excess return amounts with goodwill turn out to be positive. The correlation coefficients increase with the event period, until the highest correlation coefficient is reached in the seven-day event period.

The correlation coefficients of the acquirer stock excess return amounts with goodwill are negative. The coefficient is most negative in the seven-day event period. The negative coefficients may point at a relationship between goodwill and overpayment for acquisitions, although from these negative associations it cannot be concluded that acquirer shareholders' excess returns are negative when goodwill amounts are higher: they can also be less positive or zero, still indicating value creation for the business combination.

The correlation coefficients of the excess return amounts of the combination with goodwill provide relevant information. Although the coefficients are significant in only two out of five event periods¹⁷⁰, the negative coefficients of the significant correlations imply that acquisitions with high purchased goodwill amounts are less value-creating. This negative association between purchased goodwill and excess return amounts of the combination might indicate that other factors than value creation alone explain goodwill. This argues for the inclusion of characteristics on empire building and on bargaining in the regression analysis.

Regarding the correlations of goodwill with target's excess return amounts, acquirer's excess return amounts, as well as with combined stock excess return amounts, it emerges that their significance increases with the length of the event period. This finding may indicate that in the case of a longer event window, stock prices resemble more information regarding expectations of the value creation of the acquisition.

6.3.2 Results correlations relative goodwill and explanatory variables

Table 6-3 displays the correlation coefficients between relative goodwill amounts and explanatory variables, as well as their significance.

170 These are the event periods with the longest time horizons: seven days and eleven days.

Table 6-3: Correlation between relative goodwill and each of the explanatory variables

	Relative goodwill 1	Relative goodwill 2
Variables	Coefficients (p value)	
Operating synergy		
Dummy same sector (1=yes)	-0.058 (0.344)	-0.109* (0.077)
Relative size target to acquirer	-0.063 (0.322)	-0.157** (0.013)
Financial synergy		
Difference debt-assets ratio target and acquirer	0.227*** (0.002)	0.228*** (0.002)
Squared difference debt-assets ratio target and acquirer	0.088 (0.223)	0.037 (0.611)
Management improvement		
Acquirer Tobin's q	0.021 (0.747)	0.025 (0.689)
Target Tobin's q	0.121* (0.098)	0.114 (0.120)
Dummy acquirer Tobin's q	0.029 (0.643)	0.023 (0.724)
Dummy target Tobin's q	0.133* (0.070)	0.166** (0.023)
Acquirer – target Tobin's q		
• low – low	-0.142** (0.060)	-0.165** (0.028)
• low – high	0.168** (0.026)	0.200*** (0.008)
• high – low	-0.008 (0.921)	-0.016 (0.838)
• high – high	0.004 (0.961)	0.006 (0.941)
Empire-building		
Acquirer debt-assets ratio	0.107* (0.089)	0.0278 (0.660)
Percentage of shares owned by executives acquirer	-0.102 (0.209)	-0.0633 (0.434)
Bargaining		
Source of financing		
• percentage of cash	-0.045 (0.462)	-0.0329 (0.5936)

	Relative goodwill 1	Relative goodwill 2
Variables	Coefficients (p value)	
• percentage of stock	0.039 (0.524)	0.108* (0.080)
• percentage of other	0.018 (0.773)	-0.217*** (0.000)
Dummy tender offer (1=yes)	0.044 (0.477)	0.0447 (0.469)
Dummy merger (1=yes)	0.161*** (0.009)	0.1186* (0.054)
Other		
Dummy target services (1=yes)	0.206*** (0.001)	0.186*** (0.002)

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005 and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables ranges between 155 and 265 per variable.

Two different measures of relative goodwill amounts are used: relative goodwill 1, representing goodwill divided by the purchase price of the acquisition, and relative goodwill 2, defined as goodwill divided by the transaction value of the acquisition. The variables are categorized into operating synergy, financial synergy, management improvement, empire-building, bargaining, and other. Relative size of target to acquirer is calculated as the value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the previous fiscal year. The same sector dummy refers to the relatedness of businesses of acquirer and target and counts one if the first two digits of the four-digit SIC code of acquirer and target are the same. The difference between the debt-assets ratios of target and acquirer is derived by deducting acquirer's debt-assets ratio from target's debt-assets ratio. Acquirer and target debt-assets ratios were derived by dividing total liabilities by the total assets, using book ratios. Tobin's q is calculated as market value of the assets divided by their book value. Dummy Tobin's q is a dummy variable set to one if the firm's Tobin's q is above its median value. Tobin's q is defined to be high if Dummy Tobin's q counts one. Acquirer/target Tobin's q refers to the combination of Tobin's qs of acquirer and target. Low-low refers to an acquisition where acquirer's Tobin's q and target's Tobin's q both are low. The percentage of shares owned by the executives of the acquirer resembles the summary of percentages of shares possessed by the different executives. The tender offer dummy counts one if the acquisition technique is a tender offer. The dummy of the target services is set to one if the target company is in the services industry.

The table reports correlation coefficient estimates and, in parentheses, p-values. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively.

Source: Information on mergers and acquisitions, their value of transaction, source of financing, acquisition form, and acquisition technique is derived from SDC Platinum. Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Other balance sheet and income statement data of the acquiring and the target company in the year(s) preceding the acquisition are provided by Compustat North America.

With regard to the characteristics of management improvement, in addition to the four different combinations of acquirer and target Tobin's q can also be found Tobin's q of acquirer and target separately as well as their dummies.

Results show that both measures of relative goodwill are statistically significantly correlated to the difference of the debt-assets ratios of target and acquirer (positive), two out of four different combinations of acquirer's and target Tobin's q (low-low (negative) and low-high (positive)), and target's

industry dummy (positive). They further show a positive correlation with target's services dummy for both relative goodwill 1 and relative goodwill 2.

Target Tobin's q dummy is positively and statistically significantly correlated to relative goodwill 1 at the 10 percent level, and to relative goodwill 2 at the 5 percent level. The correlation with the merger's dummy is positive and statistically significant at the 1 percent level for relative goodwill 1, and significant at the 10 percent level for relative goodwill 2. The correlation of relative goodwill 1 with the acquirer's debt-assets ratio turns out to be statistically significant at the 10 percent level. The same applies for its correlation with target Tobin's q .

Moreover, relative goodwill 2 shows a statistically significant negative correlation with relative size and with the source of financing, when it is other than stock or cash. Further, relative goodwill 2 turns out to be significantly negatively correlated at the 10 percent level with the same sector dummy.

The results show that relative goodwill 2 is more often statistically significantly correlated with explanatory variables than relative goodwill 1. Many correlations are in line with the expectations. The negative relationship between relative size of target to acquirer and relative goodwill 2 supports the theory that operating synergies are higher when the target company is relatively small when compared to the acquiring company, as there are more opportunities for synergy effects. The positive correlation with the difference between the debt-assets ratio of target and acquirer for both relative goodwill 1 and relative goodwill 2 is as assumed and supports a positive relationship between financial synergies and goodwill.

Furthermore, the negative relationship with relative goodwill 1 and relative goodwill 2 when both acquirer's and target's management are of low quality (low-low, measured by Tobin's q) is in line with the assumption that when both acquirer's and target's managements perform worse, no value is created.

Unexpected, however, is the negative relationship between relative goodwill 2 and the same sector dummy. Perhaps the effect of managers diversifying for their personal benefits and thereby prepared to overpay for an acquisition, as raised by Morck et al. (1990)¹⁷¹, outweighs the effect of synergies created by acquisitions in the same industry.

Further, the positive relationship between acquisitions of high quality target's management by low quality acquirer's management (low-high Tobin's q) and relative goodwill 1 and 2 is other than expected. This correlation may indicate that improved management not only flows from acquirer to target, but can also flow from target to acquirer.

171 See 3.3.2.

In addition, the positive associations between target Tobin's q and relative goodwill 1 (significant at 10 percent level) and between target Tobin's q dummy and relative goodwill 1 and 2 (significant at 10 and 5 percent levels respectively) indicate that high quality management of target companies has its value.

The negative correlation between relative goodwill 2 and the source of financing, when it is other than stock or cash (significant at the 1 percent level) is not expected. Same applies for the positive correlation between relative goodwill 2 and the percentage of stock (significant at the 10 percent level). These outcomes indicate that other effects seem to prevail over the effect of personal taxes.

The positive relationship between the form of the acquisition being a merger and relative goodwill is not in line with the arguments of Bradley and Kim (1985) who assert that control premiums paid in tender offers are higher when compared to mergers, which would imply that the relative amount of goodwill would be lower in the case of mergers. The research of Jensen and Ruback (1983) and Huang and Walkling (1987) also show reverse outcomes. Perhaps the relatively high number of mergers in the sample (256, see Table 4-6) give a distorted view.

As expected, the positive correlation with target's industry dummy for both relative goodwill 1 and relative goodwill 2 indicates that higher amounts of goodwill are paid in the services sector.

Although correlations between continuous variables and categorical variables are widely used and correct, it sometimes is argued that a mean comparison test should be used instead. Therefore, additionally to the correlations between the dummy variables and relative goodwill amounts, also t-tests are performed. The t-tests assess whether the mean relative goodwill amount when the dummy variable equals zero is statistically different from its mean amount when the dummy variable counts as one. In order to test this difference, the mean of relative goodwill when the dummy is one is deducted from its mean when the dummy is zero. The tests are two-tailed and are performed on relative goodwill 1 as well as on relative goodwill 2. Table 6-4 shows the outcomes of these t-tests.

Table 6-4: *t*-tests of relative goodwill on dummy variables

	Relative goodwill 1	Relative goodwill 2
Variables	t-values (t) and p-values (p)	
Operating synergies		
Dummy same sector (1=yes)	t = 0.948 p = 0.344	t = 1.776* p = 0.077
Management improvement		
Dummy acquirer Tobin's q	t = -0.464 p = 0.643	t = -0.354 p = 0.724

	Relative goodwill 1	Relative goodwill 2
Variables	t-values (t) and p-values (p)	
Dummy target Tobin's q	t = -1.820* p = 0.070	t = -2.287** p = 0.023
Acquirer – target Tobin's q		
• low – low	t = 1.895* p = 0.060	t = 2.212** p = 0.028
• low – high	t = -2.250** p = 0.026	t = -2.691*** p = 0.008
• high – low	t = 0.100 p = 0.921	t = 0.205 p = 0.838
• high –high	t = -0.049 p = 0.961	t = -0.074 p = 0.941
Bargaining		
Dummy tender offer (1=yes)	t = -0.712 p = 0.477	t = -0.725 p = 0.469
Dummy merger (1=yes)	t = -2.642*** p = 0.009	t = -1.937* p = 0.054
Other		
Dummy target services (1=yes)	t = -3.410*** p = 0.001	t = -3.067*** p = 0.002

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005 and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables varies between 176 and 265 per variable. Two different measures of relative goodwill amounts are used: relative goodwill 1, representing goodwill divided by the purchase price of the acquisition, and relative goodwill 2, defined as goodwill divided by the transaction value of the acquisition. The variables are categorized into operating synergy, management improvement, bargaining, and other. The same sector dummy refers to the relatedness of businesses of acquirer and target and counts one if the first two digits of the four-digit SIC code of acquirer and target are the same. Dummy Tobin's q is a dummy variable set to one if the firm's Tobin's q is above its median value. Tobin's q is calculated as market value of the assets divided by their book value. Tobin's q is defined to be high if dummy Tobin's q counts one. Acquirer/target Tobin's q refers to the combination of Tobin's qs of acquirer and target. Low-low refers to an acquisition where acquirer's Tobin's q and target's Tobin's q both are low. The tender offer dummy counts one if the acquisition technique is a tender offer. The dummy of the target services is set to one if the target company is in the services industry. The table shows the t-statistics and the p-values of the differences between the relative amounts of goodwill when the dummy variables are zero and the relative amounts of goodwill when the dummy variables are one. Difference tests are based on two-tailed mean comparison t-tests. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively.

Source: Information on mergers and acquisitions, their value of transaction, acquisition form, and acquisition technique is derived from SDC Platinum. Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Other balance sheet and income statement data of the acquiring and the target company in the year(s) preceding the acquisition are provided by Compustat North America.

As expected, the outcomes of Table 6-4 are in line with the results of the correlation analyses. The results show higher relative goodwill 1 and 2 amounts when target Tobin's q dummy counts as one (significant at 10 and 5 percent levels respectively). In accordance with the outcomes of the correlation analyses, the combination 'acquirer low Tobin's q/target low Tobin's q' shows lower relative goodwill 1 and 2 amounts (significant at 10 and 5 percent levels respectively), and the combination 'acquirer low Tobin's q/target high Tobin's q' shows higher relative goodwill 1 and 2 amounts (significant at 5 and 1 percent levels respectively). In accordance with the correlation analyses, the outcomes of the t-tests also show higher relative goodwill 1 and 2 amounts when the targets are in the services industry.

The significances of these bivariate analyses (correlations as well as t-tests) provide information on associations between characteristics and goodwill, but they do not supply information on cause and effect. Multivariate analyses do consider this matter and test whether these connections also hold in combination with other characteristics. The next section provides the results of the multivariate analyses, where the variables are gathered together with control variables when explaining goodwill.

6.3.3 Results multivariate analyses

In this section, the results of the multivariate regressions of relative goodwill are discussed. As discussed in section 6.2 and shown in Table 6-1, models 1 to 6 are performed in four different settings.

Table 6-5 presents the outcomes of the regression analyses of relative goodwill 1 (purchased goodwill divided by the purchase price) with the observations that provide information on all data. This number of observations is limited and observations that do provide information on other variables are lost. Therefore, regressions are also performed with all observations, thereby correcting for missing data. Table 6-6 shows the results of the regressions of relative goodwill 1 with all observations, thereby correcting for missing data¹⁷². Correspondingly, Table 6-7 gives the results of the regression analyses of relative goodwill 2 (goodwill divided by the value of transaction) with the observations that provide information on all data, and Table 6-8 presents the outcomes of the regressions of relative goodwill 2 with all observations, thereby correcting for missing data (n=265). The outcomes are discussed below.

172 So including observations that do not provide information on the part of the data, as these are missing.

It turns out that in all regressions, the coefficient of the target services dummy is highly significant and positive, indicating that goodwill payments in the services industries are higher when compared to other industries.

Table 6-5: Results of regression analyses explaining relative goodwill 1 ($n=108-265$)

	1a	2a	3a	4a	5a	6a
Variables	Coefficients (t-values)					
Operating synergy						
Dummy same sector (1=yes)	-0.063*					-0.093*
	(-1.68)					(-1.71)
Relative size target to acquirer	-0.006					-0.025
	(-0.16)					(-0.32)
Financial synergy						
Difference debt-assets ratio target and acquirer		0.250***				0.357***
		(3.34)				(2.86)
Squared difference debt-assets ratio target and acquirer		-0.077				-0.127**
		(-1.61)				(-2.09)
Management improvement						
Low q acquirer– high q target			0.137**			0.078
			(2.41)			(1.09)
High q acquirer– high q target			0.038			-0.006
			(0.77)			(-0.08)
High q acquirer– low q target			0.039			0.051
			(0.62)			(0.59)
Empire-building						
Acquirer debt-assets ratio				0.013		0.184
				(0.13)		(1.26)
Percentage of shares owned by executives acquirer				-0.007		0.001
				(-1.50)		(0.10)
Bargaining						
Percentage of cash					-0.001	-0.000
					(-1.57)	(-0.30)
Percentage of other					0.000	-0.000
					(0.31)	(-0.06)
Dummy tender offer (1=yes)					0.044	0.002

	1a	2a	3a	4a	5a	6a
Variables	Coefficients (t-values)					
					(0.95)	(0.03)
Other						
Dummy target services (1=yes)	0.131***	0.103***	0.120***	0.127***	0.129***	0.147***
	(3.62)	(2.74)	(2.98)	(2.88)	(3.65)	(2.76)
Constant	0.581***	0.521***	0.485***	0.585***	0.561***	0.544***
	(16.38)	(21.09)	(12.90)	(10.60)	(18.26)	(4.98)
Observations	251	192	176	154	265	108
F-statistic	5.20	6.89	3.93	3.33	3.69	1.98
p-value	0.002	0.000	0.005	0.021	0.006	0.030
Adjusted R ²	0.048	0.085	0.063	0.044	0.039	0.107

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005 and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables varies between 155 and 265 per variable. Due to this availability of information on the variables, the number of observations differs from 108 to 265.

The dependent variable relative goodwill 1 represents goodwill divided by the purchase price of the acquisition. The variables are categorized into operating synergy, financial synergy, management improvement, empire-building, bargaining, and other. Relative size of target to acquirer is calculated as the value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the previous fiscal year. The same sector dummy refers to the relatedness of businesses of acquirer and target and counts one if the first two digits of the four-digit SIC code of acquirer and target are the same. The difference between the debt-assets ratios of target and acquirer is derived by deducting acquirer's debt-assets ratio from target's debt-assets ratio. Acquirer and target debt-assets ratios were derived by dividing total liabilities by the total assets, using book ratios.

Tobin's q is calculated as market value of the assets divided by their book value. Dummy Tobin's q is a dummy variable set to one if the firm's Tobin's q is above its median value. Tobin's q is defined to be high if Dummy Tobin's q counts one. Acquirer/target Tobin's q refers to the combination of Tobin's qs of acquirer and target.

Low-low refers to an acquisition where acquirer's Tobin's q and target's Tobin's q both are low. The percentage of shares owned by the executives of the acquirer resembles the summary of percentages of shares possessed by the different executives. The tender offer dummy counts one if the acquisition technique is a tender offer.

The dummy of the target services is set to one if the target company is in the services industry.

The table reports OLS regression coefficient estimates and, in parentheses, t-statistics. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively.

Source: Information on mergers and acquisitions, their value of transaction, source of financing, acquisition form, and acquisition technique is derived from SDC Platinum. Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Other balance sheet and income statement data of the acquiring and the target company in the year(s) preceding the acquisition are provided by Compustat North America.

Regression analyses of relative goodwill 1 with observations providing information on the data (limited number of observations)

Table 6-5 illustrates that regression 1a, testing *hypothesis 5* without control variables, shows *no effects* of operating synergies on relative goodwill: the coefficient of the relative size of the target to the acquirer is not significant. The coefficient of the same sector dummy is significant at the 10 percent level, but this coefficient is in another direction than expected. This gives weak support for the argument put forward by Morck et al. (1990)¹⁷³ that agency behavior of managers may result in diversifying acquisitions and may lead them to overpay for those acquisitions. This argument seems to overrule the supposition that an acquisition is creating value when target and acquirer are in the same industry and therefore increases relative goodwill.

However, regression 2a shows that financial synergies do matter: the difference of the debt-assets ratio between target and acquirer positively influences relative goodwill (jointly significant, $p\text{-value}=0.0025$). This effect *supports hypothesis 6*.

The results of regression 3a testing for *hypothesis 7* show a statistically significant positive coefficient of acquisitions of high Tobin's q targets by low Tobin's q acquirers, when compared to 'acquirer low Tobin's q /target low Tobin's q ' acquisitions. Strikingly, acquisitions of low Tobin's q targets by high Tobin's q acquirers do not generate the highest excess returns to acquirer and combination when compared to 'low Tobin's q acquirer/low Tobin's q target' acquisitions. The results *do not support hypothesis 7*, stating that if target's management improves by the acquisition, a higher amount of purchased goodwill is paid. However, they do not exclude improved management in the other direction: from target company to acquiring company. This effect can also be explained by the empire-building theory. Low quality acquirer's management can strive for its own prerequisites by acquiring well performing target companies of high management quality. It can be prepared to pay a high purchase price. From a separate F-test it turns out that Tobin's q combinations are not jointly significantly different from zero ($p=0.492$).

No statistically significant relationships can be derived from the results of regressions 4a and 5a, testing for agency and bargaining characteristics respectively.

The results of regression 6a show that even after controlling for agency and bargaining characteristics, the coefficient of the difference of the debt-assets ratio between target and acquirer remains statistically significantly positive, *providing evidence for the assumption of hypothesis 6* that financial synergies

¹⁷³ See 3.3.2.

positively influence purchased goodwill (jointly significant, 0.0186). As mentioned before, the negative coefficient of the squared difference of the debt-assets ratio between target and acquirer implies that the difference in debt has a decreasingly upward sloping effect on goodwill.

Also in this regression, unexpectedly the same sector dummy is significantly negative at the 10 percent level. This may indicate agency behavior of acquirer's management.

Regressions of relative goodwill 1 with all observations (corrections for missing data)
Table 6-6 shows the results of the six regressions, when corrections were made for missing data. Results of these regressions 1b to 6b are largely similar to the results of regressions 1a to 6a.

One main difference is the significantly positive coefficient of the acquirer's debt-assets ratio in regressions 4b and 6b. The sign of this coefficient is not in line with the expectations: a higher acquirer's debt-assets ratio was assumed to reduce acquirer management discretion, thereby limiting overpayment for the acquisition, and resulting in a lower goodwill. An alternative explanation for the negative coefficient might be that as financial leverage limits acquirer management's discretion, acquirer's management is focused on value-creating acquisitions, represented by higher goodwill amounts.

Another difference is that in regression 6b, the coefficient of the percentage of payment in cash becomes statistically significant and negative. Other than expected, its negative sign shows that when compared to stock payments, these payments negatively affect purchased goodwill. This indicates that other effects seem to prevail over the effect of personal taxes when using cash instead of stock to finance the acquisition.

Further, in regression 6b the significance of the same sector effect on purchased goodwill falls away.

The results indicate that goodwill is positively influenced by financial synergies, even after controlling for other characteristics influencing goodwill. These findings *support hypothesis 6*.

Although the positive effect of 'acquirer low Tobin's q/target high Tobin's q' on relative goodwill *does not support hypothesis 7*, stating that if target's management improves by the acquisition, a higher amount of purchased goodwill is paid, it may also be an indication of value creation by improved management (supposing that improved management not only flows from acquirer to target, but also from target to acquirer). The same holds for the positive significance of the acquirer's debt-assets ratio: a high debt-assets ratio decreases managerial discretion and may direct acquirer's management into value-creating acquisitions, reflected in higher purchased goodwill amounts. However, it is not clear whether these results provide evidence for hypothesis 7.

Table 6-6: Results of regression analyses explaining relative goodwill 1 (n=265)

	1b	2b	3b	4b	5b	6b
Variables	Coefficients (t-values)					
Operating synergies						
Dummy same sector (1=yes)	-0.051					-0.048
	(-1.39)					(-1.36)
Relative size target to acquirer	-0.009					-0.007
	(-0.24)					(-0.16)
Financial synergies						
Difference debt-assets ratio target and acquirer		0.249***				0.298***
		(3.14)				(3.57)
Squared difference debt-assets ratio target and acquirer		-0.078				-0.095*
		(-1.52)				(-1.83)
Management improvement						
Low q acquirer– high q target			0.137**			0.118**
			(2.29)			(2.05)
High q acquirer– high q target			0.039			0.052
			(0.75)			(1.02)
High q acquirer– low q target			0.040			0.048
			(0.59)			(0.74)
Empire-building						
Acquirer debt-assets ratio				0.134**		0.192***
				(2.18)		(2.90)
Perc. of shares owned by executives acquirer				-0.007		-0.005
				(-1.50)		(-0.99)
Bargaining						
Perc. of cash					-0.001	-0.001**
					(-1.57)	(-2.34)
Perc. of other					0.000	-0.001
					(0.32)	(-0.61)
Dummy tender offer (1=yes)					0.044	0.037
					(0.95)	(0.80)

	1b	2b	3b	4b	5b	6b
Variables	Coefficients (t-values)					
Other						
Dummy target services (1=yes)	0.121***	0.115***	0.116***	0.124***	0.129***	0.134***
	(3.37)	(3.39)	(3.33)	(3.63)	(3.65)	(3.88)
Constant	0.580***	0.517***	0.487***	0.532***	0.561***	0.530***
	(16.41)	(20.87)	(12.50)	(13.48)	(18.26)	(8.24)
Observations	265	265	265	265	265	265
F-statistic	3.46	6.45	3.56	5.32	3.69	3.50
p-value	0.009	0.000	0.004	0.000	0.006	0.000
Adjusted R ²	0.036	0.076	0.046	0.076	0.039	0.146

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005 and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables initially ranged between 155 and 265 per variable.

Regarding variables with missing observations, new variables are created, resembling the values of the available observations and valuing 0 when no observations are available. Each of the new variables is combined with a corresponding dummy variable reporting 1 when no observations are available and 0 elsewhere. These dummy variables are not displayed in this table.

The dependent variable relative goodwill 1 represents goodwill divided by the purchase price of the acquisition. The variables are categorized into operating synergy, financial synergy, management improvement, empire-building, bargaining, and other. Relative size of target to acquirer is calculated as the value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the previous fiscal year. The same sector dummy refers to the relatedness of businesses of acquirer and target and counts one if the first two digits of the four-digit SIC code of acquirer and target are the same. The difference between the debt-assets ratios of target and acquirer is derived by deducting acquirer's debt-assets ratio from target's debt-assets ratio. Acquirer and target debt-assets ratios were derived by dividing total liabilities by the total assets, using book ratios. Tobin's q is calculated as market value of the assets divided by their book value. Dummy Tobin's q is a dummy variable set to one if the firm's Tobin's q is above its median value. Tobin's q is defined to be high if Dummy Tobin's q counts one. Acquirer/target Tobin's q refers to the combination of Tobin's qs of acquirer and target. Low-low refers to an acquisition where acquirer's Tobin's q and target's Tobin's q both are low. The percentage of shares owned by the executives of the acquirer resembles the summary of percentages of shares possessed by the different executives. The tender offer dummy counts one if the acquisition technique is a tender offer. The dummy of the target services is set to one if the target company is in the services industry. Information on mergers and acquisitions, their value of transaction, source of financing, acquisition form, and acquisition technique is derived from SDC Platinum.

The table reports OLS regression coefficient estimates and, in parentheses, t-statistics. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively.

Source: Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Other balance sheet and income statement data of the acquiring and the target company in the year(s) preceding the acquisition are provided by Compustat North America.

Regressions of relative goodwill 2 with observations providing information on the data: limited number of observations

Table 6-7 shows the results of the regressions of relative goodwill 2 when the number of observations is limited. The results are in line with the outcomes from regressions 1a to 6a in Table 6-5 that were performed with the same limited numbers of observations by using relative goodwill 1 instead of relative goodwill 2. The main difference is that a larger number of characteristics have become significant. One difference is that in regression 1c the impact of relative size on relative goodwill becomes significant. As expected, the negative coefficient indicates that operating synergies are higher when the target company is relatively small when compared to the acquiring company. There are more opportunities for synergy effects in this case. This outcome is *supports hypothesis 5*. In regression 1c the significance of the same sector dummy further rises to 5 percent, but, as discussed earlier, in another direction than expected.

In regression 2c, the impact of the squared difference of the debt-assets ratios of target and acquirer has become significant and negative.

Further, the significance of the 'acquirer low Tobin's q/target high Tobin's q' combination (positive coefficient) increases to a 1 percent significance level in regression 3c. Remarkably, no significant effect of management improvement can be found in regression 6c.

The effect of the acquirer's debt-asset ratio on relative goodwill weakens. In regression 4c, no effect is measured. In regression 6c the coefficient of the acquirer's debt-assets ratio is now positive and significant at a 10 percent significance level. This still supports the alternative explanation that a high debt-assets ratio decreases managerial discretion and may direct acquirer's management into value-creating acquisitions, resulting in higher purchased goodwill amounts.

The same holds true for the percentage of payment in cash (negative) and the percentage of payment in other forms than cash or stock in regression 5c (negative) as well as for the percentage of payment in other forms than cash or securities in regression 6c (negative). The negative coefficients of the percentage of payment in cash and the percentage of payment in other forms than cash or stock are not expected. They indicate that other effects seem to prevail over the effect of personal taxes when using cash instead of stock to finance the acquisition.

Moreover, the significances of two characteristics already significant in regressions 1a to 6a have further increased in regressions 1c to 6c. These are the 'acquirer low Tobin's q/target high Tobin's q' dummy of regression 3c and the squared difference of the debt-assets ratios of target and acquirer of regression 6c. The significance of only one characteristic has decreased, namely the relatedness of businesses as represented by the same sector dummy in regression 6c.

Table 6-7: Results of regression analyses explaining relative goodwill 2 (n=108-265)

	1c	2c	3c	4c	5c	6c
Variables	Coefficients (t-values)					
Operating synergies						
Dummy same sector (1=yes)	-0.089**					-0.055
	(-2.09)					(-0.96)
Relative size target to acquirer	-0.071*					-0.040
	(-1.74)					(-0.47)
Financial synergies						
Difference debt-assets ratio target and acquirer		0.370***				0.506***
		(4.14)				(3.83)
Squared difference debt-assets ratio target and acquirer		-0.153***				-0.197***
		(-2.67)				(-3.06)
Management improvement						
Low q acquirer– high q target			0.200***			0.093
			(2.93)			(1.22)
High q acquirer– high q target			0.066			-0.018
			(1.11)			(-0.26)
High q acquirer– low q target			0.057			-0.013
			(0.74)			(-0.15)
Empire-building						
Acquirer debt-assets ratio				0.016		0.267*
				(0.15)		(1.72)
Perc of shares owned by executives acquirer				-0.005		0.012
				(-1.07)		(0.80)
Bargaining						
Perc. of cash					-0.001**	-0.001
					(-1.99)	(-0.84)
Perc. of other					-0.005***	-0.006**
					(-3.70)	(-2.18)
Dummy tender offer (1=yes)					0.054	0.044
					(1.04)	(0.61)

	1c	2c	3c	4c	5c	6c
Variables	Coefficients (t-values)					
Other						
Dummy target services (1=yes)	0.122***	0.087*	0.093*	0.163***	0.125***	0.168***
	(2.95)	(1.94)	(1.91)	(3.47)	(3.13)	(2.98)
Constant	0.634***	0.542***	0.490***	0.546***	0.614***	0.508***
	(15.70)	(18.32)	(10.77)	(9.29)	(17.76)	(4.40)
Observations	251	192	176	154	265	108
F-statistic	6.07	7.16	3.25	4.25	6.48	2.90
p-value	0.001	0.000	0.013	0.007	0.000	0.002
Adjusted R ²	0.057	0.088	0.049	0.060	0.077	0.187

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005 and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables varies between 155 and 265 per variable.

Due to this availability of information on the variables, the number of observations differs from 108 to 265.

The dependent variable relative goodwill 2 is defined as goodwill divided by the transaction value of the acquisition. The variables are categorized into operating synergy, financial synergy, management improvement, empire-building, bargaining, and other. Relative size of target to acquirer is calculated as the value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the previous fiscal year.

The same sector dummy refers to the relatedness of businesses of acquirer and target and counts one if the first two digits of the four-digit SIC code of acquirer and target are the same. The difference between the debt-assets ratios of target and acquirer is derived by deducting acquirer's debt-assets ratio from target's debt-assets ratio. Acquirer and target debt-assets ratios were derived by dividing total liabilities by the total assets, using book ratios. Tobin's q is calculated as market value of the assets divided by their book value. Dummy Tobin's q is a dummy variable set to one if the firm's Tobin's q is above its median value. Tobin's q is defined to be high if Dummy Tobin's q counts one. Acquirer/target Tobin's q refers to the combination of Tobin's qs of acquirer and target. Low-low refers to an acquisition where acquirer's Tobin's q and target's Tobin's q both are low. The percentage of shares owned by the executives of the acquirer resembles the summary of percentages of shares possessed by the different executives. The tender offer dummy counts one if the acquisition technique is a tender offer. The dummy of the target services is set to one if the target company is in the services industry.

The table reports OLS regression coefficient estimates and, in parentheses, t-statistics. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively.

Source: Information on mergers and acquisitions, their value of transaction, source of financing, acquisition form, and acquisition technique is derived from SDC Platinum. Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Other balance sheet and income statement data of the acquiring and the target company in the year(s) preceding the acquisition are provided by Compustat North America.

Overall, the regressions show significant effects of relatedness of business (negative in regression 1c), relative size of target to acquirer (negative at a 10 percent level in regression 1c), difference between target's and acquirer's debt-assets ratio (positive in regressions 2c and 6c), the 'acquirer low Tobin's q/target high Tobin's q' combination (positive in regression 3c), percentage of payment in cash (negative in regression 5c), percentage of payment in other forms than cash or securities (negative in regression 5c and 6c), and acquirer's debt assets ratio (positive at a 10 percent level in regression 6c).

The outcomes indicate that goodwill is positively influenced by operating synergies (relative size) and, even after controlling for other characteristics, by financial synergies.

Concluding, the weakly significant relative size coefficient in regression 1c indicates *poor evidence for hypothesis 5*. *Hypothesis 6 is supported* by both regressions 2c and 6c. Further, although the significance of 'acquirer low Tobin's q/target high Tobin's q' *does not provide support for hypothesis 7*, it may indicate improved management in the other direction: from target company to acquiring company. The slightly significant coefficient of the debt-assets ratio in regression 6c may support hypothesis 7. However, other explanations for the sign of these coefficients are also available.

Regressions of relative goodwill 2 with all observations (corrections for missing data)

Table 6-8 shows the outcomes of the regressions of relative goodwill 2 on the explanatory variables (regressions 1d to 6d), after the sample has been corrected for missing data. Compared to the other regressions, these regressions show the largest number of significant coefficients.

Also here, regression 1d attracts notice as relatedness of business is a weakly significant characteristic with a negative impact on purchased goodwill, *supporting hypothesis 5* that operating synergies are higher when the target company is relatively small when compared to the acquiring company, as there are more opportunities for synergy effects in this case. The negative coefficient of the dummy representing the relatedness of business again supports the theory of Morck et al. (1990) that empire-building behavior of managers leads to diversifying acquisitions.

As expected, regression 2d *provides evidence for hypothesis 6*. This flows from the high significances (at 1 percent levels) of the differences of the debt-assets ratio of target and acquirer (jointly significant, p-value = 0.019), indicating that financial synergies play an important role when explaining goodwill.

Regression 3d shows that, similar to regression 3c, the significance of the 'acquirer low Tobin's q/target high Tobin's q' combination (positive coefficient) increases from a 5 percent significance level to a 1 percent significance level in regression 3d, which again indicates that management improvement may also flow from target to acquiring company. However, this outcome *does not support hypothesis 7*, stating that a higher amount of purchased goodwill is paid if target's management improves by the acquisition.

In regression 4d the debt-assets ratio no longer turns out to be a significant characteristic. Regression 5d, testing for bargaining factors influencing purchased goodwill, further confirms that the impact of the percentage of financing by cash and the percentage of financing other than by stock or cash is significant. Significances of these financing forms are higher than in the preceding regressions on bargaining.

Table 6-8: Results of regression analyses explaining relative goodwill 2 (n=265)

	(1d)	(2d)	(3d)	(4d)	(5d)	(6d)
Variables	Coefficients (t-values)					
Operating synergies						
Dummy same sector (1=yes)	-0.081*					-0.089**
	-1.94					(-2.29)
Relative size target to acquirer	-0.072*					-0.010**
	-1.76					(-2.22)
Financial synergies						
Difference debt-assets ratio target and acquirer		0.369***				0.457***
		4.06				(4.96)
Squared difference debt-assets ratio target and acquirer		-0.155***				-0.180***
		-2.65				(-3.15)
Management improvement						
Low q acquirer– high q target			0.198***			0.151**
			(2.89)			(2.38)
High q acquirer– high q target			0.062			0.060
			(1.04)			(1.07)
High q acquirer– low q target			0.054			0.058
			(0.71)			(0.82)
Empire-building						
Acquirer debt-assets ratio				0.053		0.235***
				(0.74)		(3.21)
Perc. of shares owned by executives acquirer				-0.005		0.003
				(-0.91)		(0.47)
Bargaining						
Perc. of cash					-0.001**	-0.001***
					(-1.99)	(-2.90)
Perc. of other					-0.005***	-0.006***
					(-3.70)	(-4.57)
Dummy tender offer (1=yes)					0.054	0.048
					(1.04)	(0.95)

	(1d)	(2d)	(3d)	(4d)	(5d)	(6d)
Variables	Coefficients (t-values)					
Other						
Dummy target services (1=yes)	0.119***	0.120***	0.118***	0.127***	0.125***	0.118***
	(2.91)	(3.07)	(2.95)	(3.15)	(3.13)	(3.08)
Constant	0.631***	0.529***	0.482***	0.544***	0.614***	0.598***
	(15.67)	(18.65)	(10.79)	(11.69)	(17.76)	(8.393)
Observations	265	265	265	265	265	265
F-statistic	4.36	6.85	3.61	2.31	6.48	4.75
p-value	0.002	0.000	0.004	0.044	0.000	0.000
Adjusted R ²	0.049	0.082	0.047	0.024	0.077	0.204

The sample comprises 265 acquisitions that were announced and became effective in the time period 2002-2005 and that provide information on purchased goodwill, purchase price, and value of transaction. The number of acquisitions providing information on the variables initially ranged between 155 and 265 per variable. Regarding variables with missing observations, new variables are created, resembling the values of the available observations and valuing 0 when no observations are available. Each of the new variables is combined with a corresponding dummy variable reporting 1 when no observations are available and 0 elsewhere. These dummy variables are not displayed in this table. The dependent variable relative goodwill 2 is defined as goodwill divided by the transaction value of the acquisition. The variables are categorized into operating synergy, financial synergy, management improvement, empire-building, bargaining, and other. Relative size of target to acquirer is calculated as the value of transaction of the target divided by the equity market capitalization of the acquirer at the end of the prior fiscal year. The same sector dummy refers to the relatedness of businesses of acquirer and target and counts one if the first two digits of the four-digit SIC code of acquirer and target are the same. The difference between the debt-assets ratios of target and acquirer is derived by deducting acquirer's debt-assets ratio from target's debt-assets ratio. Acquirer and target debt-assets ratios were derived by dividing total liabilities by the total assets, using book ratios. Tobin's q is calculated as market value of the assets divided by their book value. Dummy Tobin's q is a dummy variable set to one if the firm's Tobin's q is above its median value. Tobin's q is defined to be high if Dummy Tobin's q counts one. Acquirer/target Tobin's q refers to the combination of Tobin's qs of acquirer and target. Low-low refers to an acquisition where acquirer's Tobin's q and target's Tobin's q both are low. The percentage of shares owned by the executives of the acquirer resembles the summary of percentages of shares possessed by the different executives. The tender offer dummy counts one if the acquisition technique is a tender offer. The dummy of the target services is set to one if the target company is in the services industry. Information on mergers and acquisitions, their value of transaction, source of financing, acquisition form, and acquisition technique is derived from SDC Platinum.

The table reports OLS regression coefficient estimates and, in parentheses, t-statistics. *, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels (two-tailed) respectively.

Source: Information on purchased goodwill and purchase price is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC). Other balance sheet and income statement data of the acquiring and the target company in the year(s) preceding the acquisition are provided by Compustat North America.

When compared to regressions 6a to 6c, regression 6d shows two new significant effects: the coefficient of the dummy for relatedness of business (negative), and the coefficient of the relative size of target to acquirer (negative) are now both significant at the 5 percent level. Whereas the first coefficient indicates agency behavior of acquirer's management, the second relationship indicates operating synergies, thereby *confirming hypothesis 5*. Moreover, regression 6d shows that in most cases the significances of the coefficients of most of the other characteristics that were significant in the earlier regressions have further increased. This relates to the significance of the coefficient of the difference between targets and acquirer's debt-assets ratio (positive). The coefficient of this ratio is now significant at the 1 percent level (jointly significant, 0.0186), which indicates financial synergies and *supports hypothesis 6*. Furthermore, the coefficient of the acquirer's debt-assets ratio (positive) is now significant at the 1% level. Also the significance of the coefficient of the percentage of financing of the acquisition other than cash or equity (negative) has increased to the 1 percent level. This significance is the same as the significance of the coefficient of the percentage of cash financing (negative at a 1 percent level). The significantly positive effect of the 'acquirer low Tobin's q/target high Tobin's q' combination on purchased goodwill in regression 6d may be an indication of value creation by improved management, as it may denote that improved management not just flows from acquirer to target, but also from target to acquirer. Assuming this relationship, although this outcome *does not support hypothesis 7*, it indicates that value creation caused by improved management may be represented in purchased goodwill. Also the positive significance of the acquirer's debt-assets ratio on purchased goodwill may point to value creation, as it can also be argued that a high debt-assets ratio decreases managerial discretion and directs acquirer's management into value-creating acquisitions, represented by higher purchased goodwill amounts. However, other explanations for the sign of these coefficients are also available.

Concluding, *hypothesis 5* is slightly *supported* by the relative size coefficient in regression 1d and strongly so by its coefficient in regression 6d. Other than expected, relatedness of business does not seem to lead to higher relative goodwill amounts from operating synergies. In both regressions 2d and 6d the coefficient of the debt-assets ratio as well as its joint significance *provide evidence for hypothesis 6*. Although the significance of the 'acquirer low Tobin's q/target high Tobin's q' dummy in regressions 3d and 6d *does not directly support hypothesis 7*, it may indicate improved management in the other direction: from target company to acquiring company. The significances of the negative coefficients for payment in cash and payment in other forms as well as of the negative coefficient of the dummy for relatedness indicate that other factors also such as bargaining may influence relative goodwill amounts. The results show that *the conclusions on hypothesis 5 to 7 hold* after controlling for other characteristics.

Sensitivity analyses

To check the robustness of the analyses, regression analyses with different specifications were carried out.¹⁷⁴ *First*, using models 1 to 6, regression analyses of relative goodwill 1 and 2 were carried out with the lowest number of valid observations: 108. This relates to the number of observations representing information on all characteristics involved and equals the number of observations in regressions 6a and 6c. The regressions show the same pattern, but as expected with rather lower significance levels.

Second, in addition to the linear regression analyses, regression analyses of the log of relative goodwill 1 and 2 were also performed. These analyses show similar outcomes, although the adjusted R squared with these logistic regressions are slightly lower. The results of these regression analyses show that similar outcomes are reached through different specifications, which confirms the robustness of the analyses: the logarithm approach shows no considerable changes in the effect of the explanatory characteristics on relative goodwill.

Third, additional regressions were employed with alternative measures of some of the characteristics of the models. With regard to operating synergies, different measures of relative size of target to acquirer were used, for instance by measuring target's size by its market capitalization instead of by its value of transaction, and by introducing a logarithm of relative size of target to acquirer in conformity with the research of Servaes (1991). Furthermore, the relatedness of business of target and acquirer was measured more concisely by comparing all four digits of the SIC code.

Regarding financial synergies characteristics, leverage differences between target and acquiring company were also measured using market values instead of book values. Regressions on financial synergies were performed both including and excluding the squared differences between the leverage ratios of target and acquirer.

Regarding improved management characteristics, alternative measures of quality of management are used. Among them are (i) the average income growth of the acquiring company, presented by (i a) growth percentages, and (i b) dummy variables counting one if the average income growth of the acquiring company is above average; (ii) the difference in average income growth between the target company and the acquiring company, and (iii) Tobin's q of the acquiring company and Tobin's q of the target company, as shown by (iii a) separate ratios, and by (iii b) separate dummies set to one if the company's Tobin's q is above average, instead of dummies representing combinations. Moreover, an alternative measure used to calculate acquirer and target's quality of management was represented by (iv) dividing the market value of equity by its book value.

174 The results of these regression analyses are available upon request.

In addition, concerning the bargaining factors, a dummy variable counting one when the company was fully financed with 100 percent cash was also used.

Although the significance levels are a little lower, the regressions of relative goodwill amounts on these alternative measures show the same patterns, which indicate the robustness of the structural models.

6.4 CONCLUSIONS

In this chapter it was tested whether purchased goodwill flows from synergies and improved management.

First, purchased goodwill was correlated to stock excess return amounts surrounding the acquisition announcement (see section 6.3.1). *Second*, correlations between relative goodwill, characteristics indicating value-creating acquisitions, and other characteristics affecting purchase price and goodwill were carried out (see section 6.3.2). *Third*, multivariate regressions of purchased goodwill were performed (see section 6.3.3).

The results of the correlations between purchased goodwill and stock excess returns surrounding the acquisition announcement show that four out of five correlation coefficients of the target and acquirer stock excess return amounts with goodwill are highly significant ($p\text{-value} < 0.01$). As expected the correlation coefficients of target stock excess return amounts with goodwill turn out to be positive. The correlation coefficient of the acquirer stock excess return amounts with goodwill is negative. Although the correlation coefficients of the combined stock excess return amounts with goodwill are significant in only two out of five event periods, the negative coefficients of the significant correlations may imply that acquisitions with high purchased goodwill amounts are less value-creating. This negative association between purchased goodwill and excess return amounts of the combination might indicate that other factors than only value creation explain goodwill. These negative signs may point to a relationship between goodwill and overpayment for acquisitions apart from value creation. Therefore, the results indicate that apart from value creation, other characteristics also play a role when explaining purchased goodwill.

The bivariate correlations of the two different measures of relative goodwill with characteristics of value-creating acquisitions are often significant and in line with expectations. Relative goodwill 2 shows the most significant correlations. The negative relationship between relative size of target to acquirer and relative goodwill 2 supports the theory that operating synergies are higher when the target company is relatively small as there are more opportunities of synergy effects. The positive correlation of goodwill with the difference between the debt-assets ratio of target and acquirer is as assumed and supports a positive relationship between financial synergies

and goodwill. Also the negative relationship with goodwill when both acquirer's and target's management are of low quality as measured by Tobin's q is in line with the assumption that when both acquirer's and target's management perform worse, no value is created. Some relationships regarding value creation and goodwill are other than expected. Among them is the negative relationship between relative goodwill and the same sector dummy, indicating that the effect of agency behavior exceeds the effect of synergies here. Also, the positive relationship between relative goodwill and acquisitions of high quality target's management by low quality acquirer's management is other than expected, although the positive impact on goodwill of this 'low acquirer Tobin's q /high target Tobin's q ' combination can still be interpreted as value creation. In addition to these characteristics of value creation, other characteristics also seem to affect goodwill. Among them are the acquirer's debt-assets ratio, the source of financing and the form of the acquisition. These significant correlations indicate that relative goodwill is not just related to value-creating characteristics.

The multivariate regressions of relative goodwill were performed with (a) a limited number of observations that provide information on all data, and (b) with all available observations, thereby correcting for missing data by means of dummy variables. Two different definitions of relative goodwill were used and regressions were performed with and without control variables.

From all four regressions on financial synergies without control variables, it turns out that financial synergies are met by higher purchased goodwill amounts.

Regressions also show that improved management, represented by a 'low acquirer Tobin's q high target Tobin's q ' combination leads to higher purchased goodwill amounts. It is then assumed that improved management not only flows from acquirer to target, but can also flow from target to acquirer, although the agency theory can also explain this relationship between 'low acquirer Tobin's q /high target Tobin's q ' combination and purchased goodwill. The expected positive effect of improved management as represented by a 'high acquirer Tobin's q /low target Tobin's q ' combination on purchased goodwill did not appear.

Two out of four regressions on operating synergies without control variables also show a significant effect of operating synergies as measured by relative size (at a 10 percent level) on relative goodwill. Although the same sector dummy is significant in three out of four of these regressions, the sign of its coefficient does not support the expected positive relationship between operating synergies by relatedness of businesses and purchased goodwill but rather indicates agency behavior.

After controlling for other characteristics, in all four regressions of the general model financial synergies remain to lead to higher purchased goodwill amounts.

The most significant characteristics are found in the two regressions with corrections for missing data. In these regressions the positive effect of improved management as resembled by a 'low acquirer Tobin's q/high target Tobin's q' combination on purchased goodwill also remains.

One regression also shows a significant effect of operating synergies as measured by relative size on relative goodwill.

The acquirer's debt-assets ratio deserves special attention. Although it was expected that a higher debt-assets ratio would limit management discretion, thereby limiting overpayment for the acquisition and resulting in lower purchased goodwill amounts, from the regressions it results that the competing theory – that financial leverage limits acquirer management's discretion and directs it into value-creating acquisitions, represented by higher goodwill amounts – overrules.

From the negative coefficients of the same sector dummy (in two regressions), and of the form of financing (cash and other, two regressions) it emerges that the empire-building theory and bargaining also contribute to an explanation of goodwill.

From the results it can be concluded that financial synergies and partly operating synergies explain purchased goodwill. These results *support hypothesis 5 and 6*. Further, if it is proposed that improved management not only flows from acquirer to target but also from target to acquirer, improved management seems to be represented in purchased goodwill as well. However, this outcome *provides no evidence for hypothesis 7*. These conclusions hold after controlling for other characteristics such as bargaining and agency motives.



7 Summary, conclusions, and discussion

7.1 SUMMARY

This dissertation is about goodwill as a measure of value creation. Recently, some important changes have taken place in the US accounting regime as well as in Europe. As a result of these changes, acquiring companies are obliged to provide more extended as well as more uniform information concerning the mergers and acquisitions in their annual accounts.

The intention of this dissertation is to gain an insight into the information content of purchased goodwill with regard to the value creation of the acquisition for the business combination.

The *central question* to be answered in this research is:

Can goodwill under the new regime be a measure of value creation? In other words, did new regulation bring the accounting concept of goodwill closer to the economic approach to goodwill, in which goodwill is regarded as the present value of the expected additional profits from the acquisition?

This central question is split up into *two research questions*:

- (I) What is the effect of the new regulation standards on the amount of purchased goodwill in relation to the total purchase price for the acquisition?
- (II) Does goodwill under the new accounting regime provide information on expected value creation of the acquisition?

The second research question leads into the following *sub-question*:

- (II) a What is the effect of the characteristics of the efficiency theory on purchased goodwill under the new accounting regime?

The research is confined to mergers and acquisitions between US publicly quoted companies, to which US GAAP apply. The decision to confine the research to the US situation was made as changes in regulation first took place in the US, resulting in an earlier availability of data when compared to in the EU.

Goodwill can be defined in various ways. Commonly, goodwill is regarded as the present value of the additional profits that the acquiring company is expecting to gain in the future resulting from the acquisition. This approach to goodwill is called the economic concept of goodwill. In addition to the economic concept of goodwill, there is also the accounting concept of goodwill. From an accounting perspective, goodwill is the difference between the purchase price and the book value of the acquired firm.

This accounting goodwill can be further broken down into four components: (1) write-up goodwill: the write-up of the target firm's assets to their fair market value, (2) going-concern goodwill: the value of the target as a going-concern, or stand-alone entity, (3) synergy goodwill: the synergistic value created by the acquisition and (4) residual goodwill: any overvaluation of consideration and/or overpayment for the target.

Changed US GAAP (2001) as well as EU regulation [IFRS (2004)] require that all business combinations must be reported in the same way, namely through the purchase method. Moreover, the acquiring company must provide information about the reasons for the acquisition and must allocate the purchase price to the assets and liabilities of the target at their fair value. Purchased goodwill, then, should represent the purchase price of the acquired firm minus the fair value of its net assets. As a consequence, the write-up component of goodwill should expire. Moreover, stricter regulation regarding the separate reporting on purchased identifiable intangible assets, which is explained by a number of examples, will further reduce the amounts of purchased goodwill, as these intangibles will no longer be accounted for as part of goodwill. In addition, the impairment test should lead to a comparison of the carrying amount of goodwill with its fair value, based on the present value of the future cash flows arising from the acquisition. This impairment test is performed annually, and whenever there is an indication that a reporting unit might be impaired. Goodwill will be impaired whenever it turns out that there is a deviation between these two values, i.e. when the fair value is lower than the carrying amount. In other words, if it seems in retrospect that residual goodwill has been involved in the acquisition (indicating that the acquisition was overpaid, or that the acquiring company overestimated the additional future profits arising from the acquisition), an impairment of goodwill should be carried out.

As a result of these changes, the information content of purchased goodwill may have increased. Goodwill may have become a more concise term that contains relevant information about expected value creation or synergy of the acquisition. When the new IFRS and SFAS are applied well, more information on purchased goodwill will become available and the accounting concept of goodwill should move towards its economic concept.

Through these changes, purchased goodwill as entered on the balance sheet of the acquiring company should become a more accurate indicator of the extra value of the acquired firm above the fair value of all of its net assets. Under ideal circumstances, the recorded goodwill should show the synergy component of goodwill and the going-concern component of goodwill. The FASB (US GAAP) and IASB (IFRS) also seemed to have had this in mind when they formulated the new standards: after all, IFRS 3 defines goodwill as "future economic benefits arising from assets that are not capable of being individually identified and separately recognized".¹⁷⁵

175 IFRS 3, 2004, Appendix A.

The question that arises here is whether the new regulation did in fact bring accounting goodwill, thus far viewed as a leftover amount that could not be identified as a separate tangible or intangible asset, more closely to the economic approach to goodwill.

The new regulations on business combinations, intangibles, and impairment and their expected implications for reporting on goodwill, lead to a number of hypotheses, which address the *first research question* of this dissertation:

- (I) What is the effect of the new regulation standards on the amount of purchased goodwill in relation to the total purchase price for the acquisition?

The corresponding *hypotheses* are as follows:

Hypothesis 1: New regulation results in more frequent reporting on purchased goodwill.

Hypothesis 2: New regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition.

Hypothesis 3: New regulation leads to more frequent reporting on separately acquired intangibles.

Hypothesis 4: Reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill.

These four hypotheses were tested in a first study in this dissertation in which reported purchased goodwill in acquisitions that were announced and completed in the period after the introduction of the new rules (time period 2002-2005) was compared to reported purchased goodwill in acquisitions that were announced and completed in the period before (time period 1997-2000). It was investigated whether the new regulation affected reporting on goodwill and, if so, whether the changes in reporting on mergers and acquisitions in the US due to this new regulation resulted in a more concise term of goodwill, comprising a lower component of the purchase price for the acquisition. First, new and old reporting regimes (time period 1997-2000 and time period 2002-2005) were compared regarding the relative amounts of purchased goodwill. Purchased goodwill amounts then were divided by the total amount of money involved in the acquisition. As it was expected that the relative amount of purchased goodwill was partly determined by the industry of the target company (services, technology), the study controlled for the effect of industry on purchased goodwill. *Second*, it was tested whether the availability of information on intangible assets apart from purchased goodwill (as intended by the new regulation) contributes to a lower relative amount of purchased goodwill. Another question here is whether under the new regime more frequent reporting on separately acquired intangibles is found. This was followed by, *third*, an in-depth analysis of intangible assets,

where the contents of information regarding intangible assets as well as relative amounts accounted for are compared in the two time periods. Again, the study controlled for the effect of industry on relative amounts of the intangible assets. *Fourth*, regressions of relative amounts of purchased goodwill were performed, to test for the combined effects of new regulation, the availability of separately reported intangible assets, and the industry of the target company.

Preceding the research into goodwill, a thorough data collection was carried out. Data were collected from existing databases, but also manually by carefully going through the notes to the financial statements in the annual reports of the acquiring company. In addition, time series calculations were performed to obtain the required data on stock excess returns.

The initial sample of mergers and acquisitions was compiled from the SDC Platinum database. Mergers and acquisitions selected were between US publicly quoted companies to which US GAAP apply, with announcement dates as well as effective dates between January 1997 and December 2000 (time period 1997-2000, before new regulation), and January 2002 and December 2005 (time period 2002-2005, after new regulation came into force) respectively.

Information on purchased goodwill amounts, acquired intangible assets numbers and purchase prices were derived by accurately analyzing the notes to the financial statements in the acquiring companies' 10-K form annual reports. These annual reports are available with the SEC's filings and forms (EDGAR filings and forms). The final sample consisted of 488 observations: 222 in time period 1997-2000 and 266 in time period 2002-2005.

The results of the research show that after new regulation came into force, a much larger percentage of companies reported on purchased goodwill. This finding supports hypothesis 1, stating that new regulation results in more frequent reporting on purchased goodwill. Further, it was found that in the period after the introduction of the new regulation, the relative amount of goodwill is lower when compared to relative goodwill in the period before. Even if corrections are made for target industries, these findings remain the same. These research results support hypothesis 2, which states that new regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition.

Moreover, the results indicate that the separate disclosure of intangible assets in addition to goodwill negatively affect the amount of goodwill, which provides evidence for hypothesis 4, that reporting on separately acquired intangible items reduces purchased goodwill. Compared to acquiring companies in time period 2002-2005, in time period 1997-2000 only a limited number of acquiring companies recognize intangible assets other than purchased goodwill. This finding provides evidence for hypothesis 3, that new regulation leads to more frequent reporting on separately acquired intangible items. However, as soon as intangible assets are reported, relative

amounts of these intangible assets are higher in time period 1997-2000 when compared to time period 2002-2005. Results further show that some of the recorded items in time period 1997-2000 are not allowed (workforce) or are restrained by the new regulation (IPRD). Results indicate that regulation seems to have brought more consistency in separate reporting on intangible assets. The analysis of the impact of the combined effect of the time period, the presence of intangible assets and, as control variables, industry classifications into services and technology on goodwill shows that the new regulations and the related reporting on other intangible assets negatively influence goodwill. These outcomes support hypothesis 4, that reporting on separately acquired intangible assets reduces purchased goodwill, and also hypothesis 2, that new regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition. The above-mentioned results indicate that the changes in regulation powerfully influence reporting on purchased goodwill. Goodwill has become a more concise concept.

The results may indicate that the new regulation has brought accounting goodwill and economic goodwill closer together. This requires further research on goodwill in the period since the introduction of the new regulation, to address the following question: Can purchased goodwill be used as a new measure of value creation of acquisitions, in addition to more conventional measures such as stock excess returns and return on equity?

Therefore, this dissertation contains a second study that focuses attention on goodwill as a measure of value creation: hypotheses about creation of value by acquisitions are tested on purchased goodwill.

First, previous literature presenting acquisition theories that may help to explain goodwill and the state of the art of research into these acquisition theories was considered. A theory that seems to be obvious when testing for goodwill is the efficiency theory. This theory claims that acquisitions are initiated by managers attempting to create value. The new combination will be more productive than the sum of its parts, due to synergy gains and to improved managerial effectiveness of the target company. Goodwill may represent this, as acquiring companies are prepared to pay for the expected value creation caused by the acquisitions.

Another theory that seems to be relevant to the research is the empire-building theory. The *empire-building theory* states that acquisitions are planned and executed by the managers of the buyer's company, in order to maximize their own utility instead of shareholder value. Other determinants that may influence the amount of purchased goodwill are the bargaining position of the parties and misvaluation of acquirer or target by the stock market.

These theories were tested in multiple studies, by making use of stock excess returns analyses. The analyses provide evidence for the efficiency theory that acquisitions create value. They also provide some useful characteristics of value-creating acquisitions. However, other acquisition theories are also supported by these studies. In other words, besides the efficiency theory, other acquisition theories can also explain stock excess

returns. Therefore, in the research into goodwill as a measure for value creation, characteristics of other theories explaining goodwill should also be taken into account. When explaining goodwill, this study rests on research that tests the efficiency theory and the other theories on target stock excess returns and bid premiums. As it may be assumed that goodwill moves in line with target stock excess returns and bid premiums, previous studies on target returns and bid premiums may serve as a basis for this study.

The research into goodwill as a measure of value creation answers the *second research question*:

- (II) Does goodwill under the new accounting regime provide information on expected value creation of the acquisition?

The second research question leads into the following *sub-question*:

- (II) a What is the effect of the characteristics of the efficiency theory on purchased goodwill under the new accounting regime?

The following *hypotheses* are formulated:

Hypothesis 5: The more operating synergy that emerges from the acquisition, the higher the amount of purchased goodwill will be.

Hypothesis 6: Financial synergy resulting from an acquisition positively influences the amount of purchased goodwill.

Hypothesis 7: If target's management improves by the acquisition, a higher amount of purchased goodwill is paid.

As mentioned earlier, in the research into goodwill as a measure for value creation, characteristics of other theories explaining goodwill should also be taken into account.

Characteristics of value-creating acquisitions (arising from the efficiency theory) and of other theories explaining goodwill were derived from literature concerning research on target stock returns and bid premiums and can be read from the following tables.

Table 7-1: Goodwill and value creation: characteristics from the efficiency theory

Value creation from	Characteristics	Effect on goodwill
Operating synergies	Relatedness of business	Positive
	Relative size of target to acquirer	Negative
Financial synergies	Difference in leverage target to acquirer	Positive
Improved management	Acquirer Tobin's q or market to book value	Positive
	Target Tobin's q or market to book value	Negative

Table 7-2: Goodwill and value creation: control variables derived from other theories

Theory	Characteristics	Effect on goodwill
Empire-building	Fraction of acquirer's shares held by corporate officers and members of the board of directors	Negative
	Fraction of targets shares held by corporate officers and members of the board of directors	Negative
	Acquirer's leverage	Negative
Bargaining	Form of payment: cash	Positive
	Form of acquisition: tender	Positive
	Number of bidders	Positive
	Resistance to the offer (hostile offer)	Positive

The starting point of this second study is with the same sample and data as the first study into goodwill. However, it focuses on acquisitions that were announced and became effective in time period 2002-2005, thus after new regulation came into force. For this in-depth research, some extra data are derived from the COMPUSTAT database and from the CRSP database.

This second study into goodwill measuring value creation of acquisitions was conducted in three steps. First, correlations of purchased goodwill with stock excess returns were carried out. The event windows used to calculate the stock excess returns vary from the announcement day (0), to 11 days (-5, +5) surrounding the announcement. Second, bivariate analyses regarding correlations between purchased goodwill and characteristics of value-creating acquisitions, as well as other characteristics affecting goodwill, were carried out. Third, multivariate regressions of purchased goodwill on these characteristics were performed.

Some of the characteristics suggested in the tables cannot be taken into consideration in this research because of a low number of relevant observations or because of a low frequency of certain events. These characteristics are: the percentage of shares owned by all executives in the target company, the number of bidders for the target company, and the variable representing target management's resistance to the offer.

The results of correlations between purchased goodwill and stock excess returns surrounding the acquisition announcement show that four out of five correlation coefficients of the target and acquirer stock excess return amounts with goodwill are highly significant (p -value <0.01). As expected, the correlation coefficients of target stock excess return amounts with goodwill turn out to be positive. The correlation coefficient of the acquirer stock excess return amounts with goodwill is negative. Although the correlation coefficients of the excess return amounts of the combination are significantly negative in only two out of five event periods, the significant correlations imply that acquisitions with high purchased goodwill amounts are less value-creating for the business combination. This negative association between

purchased goodwill and excess return amounts of the combination might indicate that other factors than only value creation explain goodwill.

The bivariate correlations of relative purchased goodwill amounts with characteristics of value-creating acquisitions (arising from the efficiency theory) turn out to be often significant and in line with expectations. The positive correlation of goodwill with the difference between the leverage ratio of target and acquirer was as assumed and supports a positive relationship between financial synergies and goodwill. The negative relationship between relative size of target to acquirer and goodwill supports the theory that operating synergies are higher when the target company is relatively small, as there are more opportunities of operating synergy effects. Also, the negative relationship with goodwill when both acquirer's and target's management are of low quality, as measured by Tobin's q , is in line with the assumption that when both acquirer's and target's management perform worse, no value is created, as management quality is not improved then. Some relationships regarding value creation and goodwill are other than expected. Among them is the negative relationship between relative goodwill and the relatedness of industries, indicating that the effect of agency behavior (where acquirer's management prefers acquiring target companies in other industries, in order to diversify the business) may exceed the effect of synergies here. Further, the positive relationship between relative goodwill and acquisitions of high quality target's management by low quality acquirer's management is other than expected, although the positive impact on goodwill of this 'acquirer low Tobin's q /target high Tobin's q ' combination can still be interpreted as value creation. After all, one may assume that management quality can also be transferred from target to acquirer.

In addition to these characteristics of value creation, other characteristics seem also to be related to goodwill. Among them are the acquirer's leverage ratio, the source of financing and the form of the acquisition.

Multivariate regressions of purchased goodwill on characteristics indicating value-creating acquisitions are performed both with and without control variables for other characteristics. Further, they are performed with the observation that provides information on the data and with all available observations, thereby correcting for missing data.

From all regressions without control variables, it results that, as expected, the presence of financial synergies (as measured by the difference between the leverage ratios of target and acquirer) are met by higher purchased goodwill amounts. These results support hypothesis 6, which states that financial synergy resulting from an acquisition positively influences the amount of purchased goodwill. These regressions also show that improved management, resembled by an 'acquirer low Tobin's q /target high Tobin's q ' combination leads to higher purchased goodwill amounts.¹⁷⁶ It is then assumed that improved management not only flows from acquirer to target

176 When compared to an 'acquirer low Tobin's q /target low Tobin's q ' combination, where no improved management opportunities are available.

but can also flow from target to acquirer, although the agency theory can also explain this relationship between an 'acquirer low Tobin's q /target high Tobin's q ' combination and purchased goodwill. The expected positive effect of improved management of the target company by high quality management of the acquiring company as represented by an 'acquirer high Tobin's q /target low Tobin's q ' combination on purchased goodwill does not appear. The results do not support hypothesis 7, stating that if target's management improves by the acquisition, a higher amount of purchased goodwill is paid. However, they do not exclude improved management in the other direction: from target company to acquiring company. This effect can also be explained by the empire-building theory. Low quality acquirer's management can strive for its own prerequisites by acquiring well performing target companies of high management quality. It can be prepared to pay a high purchase price.

Taking into account the control variables, when performing the regression analyses, the presence of financial synergies remains to be met by higher purchased goodwill amounts. These outcomes are in line with hypothesis 6.

The most significant characteristics are found in the two regressions on all observations with corrections for missing data. In these regressions, the positive effect of improved management as represented by an 'acquirer low Tobin's q /target high Tobin's q ' combination on purchased goodwill also remains. They further show a significant negative effect of the relatedness of industries on purchased goodwill, which is other than expected. The negative effect supports the agency theory, according to which acquirer's management prefers acquiring target companies from different industries in order to create diversification. A positive effect would have been an indication of operating synergies and would have supported hypothesis 5. Some cases show a significant effect on relative goodwill of operating synergies as measured by relative size of target to acquirer. This result is as expected, as it is argued that operating synergies effects are higher when the target company is smaller in comparison to the acquiring company. This outcome provides evidence for hypothesis 5, stating that the more operating synergy that emerges from the acquisition, the higher the amount of purchased goodwill will be.

Special attention is drawn to the positive effect of the acquirer's leverage ratio on purchased goodwill. It was expected that a higher leverage ratio would have a disciplining effect and management discretion, thereby limiting overpayment for the acquisition and resulting in lower purchased goodwill amounts. However, from the regressions it emerges that a competing theory probably overrules – that of financial leverage limiting acquirer management's discretion and directing it into value-creating acquisitions, represented by higher goodwill amounts.

From the results, it can be concluded that financial synergies and partly operating synergies do explain purchased goodwill. These results support hypotheses 5 and 6. Further, if put that improved management not only flows from acquirer to target, but also from target to acquirer, improved management seems to be represented in purchased goodwill as well. Although this outcome does not support hypothesis 7, it may indicate that improvement of acquirer's management resulting from the acquisition positively affects purchased goodwill.

These conclusions hold after controlling for other characteristics explaining purchased goodwill, such as bargaining and agency motives.

7.2 CONCLUSIONS

When turning to the two research questions, it can be concluded that as a result of new accounting regulation, goodwill has become a more concise term. Further, it is shown that goodwill contains elements of value creation: characteristics of value-creating acquisitions have a positive effect on purchased goodwill. This conclusion holds after controlling for characteristics of empire-building and bargaining. It can be concluded that results indicate that characteristics from the empire-building theory and from bargaining do also influence goodwill.

Turning to the central question, it can be concluded that new regulation did indeed bring the accounting concept of goodwill closer to the economic approach to goodwill, in which goodwill is regarded as the present value of the expected additional profits from the acquisition. Results show that goodwill under the new regime might be a measure of value creation, although other characteristics also determine the amount of purchased goodwill.

7.3 DISCUSSION

This dissertation presents innovative research into goodwill as a measure of value creation of acquisitions in three respects. (i) It is the first study that empirically examines whether purchased goodwill under the new reporting regime has become a more concise term when compared to purchased goodwill under the old reporting regime. (ii) It is innovative in that characteristics of the efficiency theory and other theories explaining acquisitions that were previously tested on stock excess returns are now applied to purchased goodwill. It is the first study that relates acquisition theories to purchased goodwill amounts. The research implicitly examines here whether purchased goodwill may serve as an alternative measure of value creation to stock excess returns. (iii) It analyzes purchased goodwill as a dependent variable, whereas in most previous studies goodwill is an independent variable explaining market value or stock excess returns of the company.

This research is a first step in a new research direction and thereby also has its limitations. Although it controls for differences of relative amounts of purchased goodwill resulting from the particular industries of the companies, the classification into industries is approximate; target companies are classified into services and other industries (chapter 5 and chapter 6) and into technology and other industries (chapter 5). Perhaps a more refined classification would lead to more accurate results.

One phenomenon not taken into account in this research is merger waves. Both time periods of the research fall in merger waves. Time period 1997-2000 is in the fifth merger wave from 1993-2000, which ended with the bursting of the Millennium bubble. Time period 2002-2005 is part of the sixth merger wave, which started in 2002 and lasted until the beginning of the financial crisis in 2008. The research outcomes may be improved when taking into consideration specific characteristics of these merger waves.

This study makes use of research approaches of previous studies that tested for the efficiency theory and for the other theories and factors affecting target stock excess returns and bid premiums, as it may be assumed that goodwill moves in line with them. Acquirer stock excess returns, combined stock excess returns and characteristics explaining them are not taken into account in this research of acquisition theories. However, by leaving these stock excess returns aside, some theories cannot be demonstrated or proven with certainty. A theory that cannot be demonstrated when not taking into consideration the acquirer stock excess returns is called the misvaluation theory. By leaving combined stock excess returns aside, it is difficult to distinguish the hubris from the empire-building theory. Taking into account these acquirer and combined stock excess returns and the characteristics explaining them will further increase the explanatory power of this research.

This research focuses on the synergy component of goodwill. No attention is paid to the going-concern component of goodwill, and only partial attention to the residual component of goodwill. This calls for future research into characteristics explaining the going-concern component of goodwill. One angle for this research into the going-concern component of goodwill may be the employees of the company and, for example, their education and their training costs. The residual component of goodwill may be further unravelled by examining goodwill impairments.

Research into goodwill is far from exhausted. It offers many possibilities for future studies. From the above it can be seen that research can be refined, by implementing more accurate classifications into industries, and by considering specific characteristics of the time period in which the acquisition falls. It further appears that the current research into goodwill can be expanded by taking into account acquirer and combined stock excess returns and characteristics explaining them. Moreover, it is evident that research into characteristics explaining the going-concern component of goodwill and the residual component of goodwill will further increase the explanatory power of this study.

An interesting subject for future research is purchased goodwill for acquisitions between publicly quoted European companies, subject to IFRS. Can similar conclusions be drawn?

Another interesting angle for future research is whether the latest US GAAP (2007) and IFRS (2008) regulation on business combinations and intangible assets did in fact bring accounting goodwill more closely aligned to the economic approach to goodwill.

A long task lies ahead. But some important first steps have been taken.

Table 7-3 provides an overview of this research into goodwill.

Table 7-3: Overview of the research

<p>Central question: Can goodwill under the new regime be a measure of value creation? In other words, did new regulation bring the accounting concept of goodwill closer to the economic approach to goodwill, in which goodwill is regarded as the present value of the expected additional profits from the acquisition?</p>	
<p>Research question (I): What is the effect of the new regulation standards on the amount of purchased goodwill in relation to the total purchase price for the acquisition?</p>	<p>Research question (II): Does goodwill under the new accounting regime provide information on expected value creation of the acquisition? Sub-question (II)a: What is the effect of the characteristics of the efficiency theory on purchased goodwill under the new accounting regime?</p>
<p>Foundation in chapter 2: Due to changes in the US accounting regime affecting reporting on purchased goodwill, theoretically purchased goodwill as entered on the balance sheet of the acquiring company should have become a more accurate indicator of the extra value of the acquired firm above the fair value of all of its net assets.</p>	<p>Foundation in chapter 3: Purchased goodwill can be explained by the efficiency theory but also by other theories and factors such as the empire-building theory and bargaining. Characteristics of value-creating acquisitions (derived from the efficiency theory) and of other theories explaining goodwill are taken from literature about research on target stock returns and bid premiums.</p>
<p>Hypothesis with research question (I): H1: New regulation results in more frequent reporting on purchased goodwill. H2: New regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition. H3: New regulation leads to more frequent reporting on separately acquired intangibles. H4: Reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill.</p>	<p>Hypotheses with research questions (II) and (II) a. H5: The more operating synergy that emerges from the acquisition, the higher the amount of purchased goodwill will be. H6: Financial synergy resulting from an acquisition positively influences the amount of purchased goodwill. H7: If target's management improves by the acquisition, a higher amount of purchased goodwill is paid.</p>

<p>Research in chapter 5: Empirical research into the impact of the new accounting regime on accounting for purchased goodwill. Comparisons of new (2002-2005) and old regime (1997-2000) regarding information on and relative amounts of purchased goodwill and intangible assets, both before and after controlling for other characteristics. Regressions of relative amounts of purchased goodwill on the combined effect of the characteristics.</p>	<p>Research in chapter 6: Empirical research into effect of characteristics of the efficiency theory on relative goodwill amounts. Correlations of purchased goodwill with stock excess returns surrounding the acquisition announcement. Bivariate analyses regarding correlations between relative goodwill, characteristics indicating value-creating acquisitions, and other characteristics affecting purchase price and goodwill. Multivariate regressions of purchased goodwill on characteristics indicating value-creating acquisitions derived from the efficiency theory, thereby controlling for characteristics of other acquisition theories (empire-building and bargaining).</p>
<p>Answers to hypotheses 1 to 4: H1 supported in section 4.2.2, table 4-2. H2 supported in section 5.3.2, tables 5-1 to 5-5 and partly supported in section 5.3.5, table 5-17. H3 supported in section 5.3.4, table 5-9 to 5-12. H4 supported in section 5.3.5, table 5-17.</p>	<p>Answers to hypotheses 5 to 7: H5 partly supported in table 6-6 and table 6-7, not supported in table 6-4 and table 6-5. H6 supported in all regressions (tables 6-4, 6-5, 6-6, and 6-7). H7 when considering management improvement from target to acquirer, partly supported in tables 6-4, 6-5, 6-6, and 6-7).</p>
<p>Answer to research question (I): New regulation and the related reporting on other intangibles resulted in a reduction of purchased goodwill in relation to the total purchase price for the acquisition. Goodwill has become a more concise term.</p>	<p>Answer to research questions (II) and (II) a: Some of the characteristics of value-creating acquisitions have a positive effect on purchased goodwill. The characteristics relate to operating synergies as measured by relative size, financial synergies, and management improvement when considering it from target to acquirer. This conclusion holds after controlling for characteristics of empire-building and bargaining. It can be concluded that results indicate that characteristics from the empire building theory and from bargaining also influence goodwill. Relatively low adjusted R^2 of the regressions show that other characteristics must play a role when explaining goodwill. These are to be discovered.</p>
<p>Answer to central question: Results from the research in chapter 5 show that new regulation did indeed bring the accounting concept of goodwill closer to the economic approach to goodwill: goodwill has become a more concise term when compared to goodwill under the old regime. Results from the research in chapter 6 show that goodwill under the new regime might be a measure of value creation, although other characteristics also determine the amount of purchased goodwill.</p>	



Samenvatting goodwill en waardecreatie van overnames

Dit proefschrift gaat over goodwill als maatstaf voor waardecreatie. Een aantal jaren geleden heeft zich in de Verenigde Staten van Amerika (hierna VS, 2001) een aantal belangrijke wijzigingen voorgedaan op het gebied van de externe verslaggeving. Kort daarop werd ook de regelgeving in de Europese Unie (hierna EU, 2004) aangepast. Sinds de invoering van deze regelgeving dienen overnemende ondernemingen in hun externe verslaggeving meer uitgebreide en uniforme informatie te verschaffen over door hen aangegane fusies en overnames.

In dit onderzoek wordt nagegaan of de door de overnemende ondernemingen gerapporteerde betaalde goodwill informatie voor de bedrijfscombinatie bevat over de waardecreatie van de overname.

De bijbehorende *centrale vraag* in dit onderzoek is:

Kan goodwill onder de nieuwe regels voor externe verslaggeving dienen als een maatstaf voor waardecreatie? Anders geformuleerd: heeft de nieuwe regelgeving de in de jaarverslaggeving vermelde betaalde goodwill (*accounting goodwill*) dichterbij de economische betekenis (*economische goodwill*) gebracht, waarin goodwill wordt beschouwd als de contante waarde van de toekomstige overwinsten?

De centrale vraag is onderverdeeld in *twee onderzoeksvragen*:

- (I) Wat is het effect van de nieuwe regelgeving op het bestanddeel van betaalde goodwill in de totale overnameprijs?
- (II) Geeft goodwill onder de nieuwe regelgeving informatie over de verwachte waardecreatie van de overname?

Aan de tweede onderzoeksvraag is de volgende *deelvraag* toegevoegd:

- (II) a Wat is onder de nieuwe regelgeving het effect van de karakteristieken van de efficiëntie theorie op betaalde goodwill?

Het onderzoek richt zich op fusies en overnames tussen beursgenoteerde ondernemingen in de VS, waarop de verslaggevingregels van de VS (US GAAP) van toepassing zijn. De focus ligt op de Amerikaanse situatie, aangezien de gewijzigde US GAAP eerder zijn ingevoerd in de VS dan de veranderde IFRS in de EU. Hierdoor waren de goodwill data van de VS bij toepassing van de gewijzigde regelgeving eerder beschikbaar.

Goodwill wordt op verschillende manieren gedefinieerd. Een veel voorkomende omschrijving van goodwill is dat het de contante waarde van de toekomstige overwinsten weergeeft, die de overnemende onderneming door de overname verwacht te realiseren. Deze benadering van goodwill wordt wel het economische goodwill begrip genoemd. Daarnaast kan goodwill worden beschouwd vanuit een *accounting* perspectief. Goodwill wordt dan gedefinieerd als het verschil tussen de overnameprijs en de boekwaarde van de over te nemen onderneming.

Deze zogenaamde *accounting* goodwill kan verder worden onderverdeeld in vier componenten: (1) *write-up* goodwill: de opwaardering van de activa van de doelwitonderneming naar hun 'fair value', (2) *going-concern* goodwill: de waarde van de doelwitonderneming als going-concern, ofwel zelfstandige eenheid, (3) *synergy* goodwill: de verwachte waardecreatie van de overname als gevolg van synergy, en (4) *residual* goodwill: de overwaardering of het teveel betaald hebben voor de overname.

De gewijzigde US GAAP (2001) en de nieuwe regelgeving voor de EU [IFRS (2004)] vereisen dat alle nieuwe bedrijfscombinaties op dezelfde manier worden verantwoord, namelijk gebruikmakend van de *purchase method*. De overnemende onderneming moet bovendien informatie verstrekken over de overnamemotieven en moet de overnameprijs verantwoorden over de activa en passiva van de overgenomen onderneming, tegen *fair value*. De betaalde goodwill bestaat dan de overnameprijs van de overgenomen onderneming minus de *fair value* van de netto activa ervan. Als gevolg hiervan valt de *write-up* component van goodwill weg. Verder leidt de aangescherpte regelgeving omtrent de afzonderlijke rapportering van overgenomen identificeerbare immateriële vaste activa (die bovendien wordt toegelicht aan de hand van een aantal voorbeelden) tot een daling van het bedrag aan goodwill. Deze overgenomen immateriële vaste activa worden immers niet langer verantwoord onder goodwill. Daarnaast heeft de regelgeving rondom de *impairment test* tot gevolg dat jaarlijks, en op ieder ander moment waarop daartoe aanleiding is, de boekwaarde van goodwill wordt vergeleken met de *fair value* ervan, waarbij de *fair value* is gebaseerd op de contante waarde van de toekomstige incrementele kasstromen die voortvloeien uit de acquisitie. Goodwill zal worden afgewaardeerd zodra blijkt dat de *fair value* van goodwill lager is dan de boekwaarde ervan. Dit heeft tot gevolg dat als er teveel voor de overname is betaald, of indien achteraf blijkt dat de overnemende onderneming de overwinsten van de overname overschat heeft, het bestanddeel *residual* goodwill wordt afgewaardeerd (een bijzondere waardevermindering).

Concluderend kan worden gesteld dat theoretisch door US GAAP (2001) en IFRS (2004) de door overnemende ondernemingen gerapporteerde betaalde goodwill een kernachtiger begrip is geworden en potentieel informatie bevat over de verwachte waardecreatie van de overname.

Als US GAAP (2001) en IFRS (2004) in de verslaggeving door ondernemingen worden nageleefd, zal meer informatie over de betaalde goodwill

worden gegeven en zal het *accounting* goodwill begrip naar het *economische* goodwill begrip toegroeien.

Door deze veranderingen dient de door de overnemende onderneming in de jaarverslaggeving verantwoorde betaalde goodwill meer nauwkeurige informatie te verschaffen over de extra waarde van de overgenomen onderneming boven de *fair value* van haar netto activa. Onder ideale omstandigheden omvat de voor de overname betaalde goodwill (*accounting* goodwill) uitsluitend een *synergy* goodwill component en een *going-concern* goodwill component.

De regelgevende instanties FASB (US GAAP) en IASB (IFRS) lijken dit voor ogen te hebben gehad toen zij de nieuwe regels formuleerden. Zo definieert IFRS 3 goodwill als de toekomstige economische voordelen die voortvloeien uit activa die niet individueel kunnen worden geïdentificeerd en apart kunnen worden vermeld.

De vraag die zich hier voordoet is of de nieuwe regels het begrip *accounting* goodwill, tot dusver beschouwd als een restbedrag van items die niet als afzonderlijk identificeerbare immateriële of materiële activa kunnen worden aangemerkt, nader tot het begrip *economische* goodwill hebben gebracht.

De nieuwe regelgeving op het terrein van bedrijfscombinaties, immateriële vaste activa en bijzondere waardevermindering en hun verwachte effecten op de externe verslaggeving over de bij een overname betaalde goodwill, leidt tot enkele hypothesen, die betrekking hebben op de *eerste onderzoeksvraag* van dit proefschrift:

- (I) Wat is het effect van de nieuwe regelgeving op het bestanddeel van betaalde goodwill in de totale overnameprijs?

De bijbehorende *hypothesen* luiden als volgt:

- Hypothese 1: Nieuwe regelgeving leidt tot een hoger percentage vermeldingen van de bij overnames betaalde goodwill.
- Hypothese 2: Nieuwe regelgeving resulteert in een kernachtiger goodwill begrip: de voor een overname betaalde goodwill maakt een lager percentage van de overnameprijs uit.
- Hypothese 3: Nieuwe regelgeving leidt tot een hoger percentage vermeldingen van de bij overnames overgenomen immateriële vaste activa.
- Hypothese 4: Afzonderlijke vermelding van overgenomen immateriële vaste activa, zoals vereist door de nieuwe regelgeving, leidt tot een lager bedrag aan betaalde goodwill.

Deze vier hypothesen zijn onderzocht door vergelijking van gerapporteerde betaalde goodwill bij overnames die zijn aangekondigd en gerealiseerd in de periode 1997-2000 (voor invoering van de nieuwe regelgeving) met gerap-

porteerde betaalde goodwill bij overnames die zijn aangekondigd en gerealiseerd in de periode 2002-2005 (na invoering van de nieuwe regelgeving).

Er is onderzocht of de gewijzigde regelgeving effect heeft gehad op de verslaggeving over betaalde goodwill. Hebben de veranderingen in de verslaggeving over fusies en overnames in de VS geleid tot de presentatie van een meer kernachtig goodwill begrip, blijktens een lager percentage dat de betaalde goodwill deel uitmaakt van de overnameprijs?

Allereerst zijn de betaalde relatieve goodwillbedragen in de twee perioden (1997-2000 en 2002-2005) met elkaar vergeleken. De betaalde goodwill wordt daarbij uitgedrukt als percentage van de betaalde overnamesommen. De bedrijfstak waarin de doelwitonderneming actief is kan van invloed zijn op de hoogte van de betaalde goodwill en zo een vertekend beeld geven. Om die reden houdt het onderzoek rekening met het effect van de bedrijfstak van de doelwitonderneming (classificaties naar dienstverlening of technologie) op betaalde goodwill.

Ten tweede is nagegaan of de vermelding van informatie over immateriële vaste activa afzonderlijk van betaalde goodwill (zoals beoogd in de nieuwe regelgeving) leidt tot een relatief lager bedrag aan betaalde goodwill. Hierbij wordt tevens onderzocht of onder de gewijzigde regelgeving relatief vaker melding wordt gemaakt van immateriële vaste activa anders dan betaalde goodwill.

Ten derde is de verslaggeving door de overnemende ondernemingen van de overgenomen immateriële vaste activa in meer detail doorgenomen. De relatieve omvang van de betaalde immateriële vaste activa tussen de twee perioden (1997-2000 en 2002-2005) is vergeleken en de opbouw van de posten is bestudeerd. Ook bij de vergelijking van de relatieve omvang van de betaalde immateriële vaste activa wordt rekening gehouden met het effect van de bedrijfstak van de doelwitonderneming op deze omvang.

Ten vierde is aan de hand van regressies van relatieve goodwillbedragen het gezamenlijke effect van nieuwe regelgeving, de afzonderlijke vermelding van immateriële vaste activa en de bedrijfstak van de doelwitonderneming op goodwill bestudeerd.

Voorafgaand aan het goodwillonderzoek heeft een uitgebreide dataverzameling plaatsgevonden. Data zijn verzameld uit bestaande databases, maar ook handmatig, door zorgvuldige bestudering van de toelichtingen op de jaarrekeningen van de overnemende ondernemingen. Daarnaast zijn *time series* berekeningen uitgevoerd om de voor het onderzoek vereiste data over buitengewone rendementen op aandelen te verkrijgen.

De aanvankelijke steekproef van fusies en overnames is afkomstig van het databestand SDC Platinum. Daaruit zijn fusies en overnames tussen beursgenoteerde ondernemingen in de VS geselecteerd, waarop de verslaggevingregels van de VS (US GAAP) van toepassing zijn en die zijn aangekondigd en gerealiseerd tussen respectievelijk januari 1997 en december 2000 (periode 1997-2000, voordat de gewijzigde regelgeving van kracht werd), en

januari 2002 en december 2005 (periode 2002-2005, na de invoering van de gewijzigde regelgeving). Informatie over betaalde goodwill, overgenomen immateriële vaste activa en overnameprijzen zijn verkregen door nauwkeurige analyse van de toelichtingen op de jaarrekeningen in de jaarverslagen van de overnemende ondernemingen (10-K forms).

Deze jaarverslagen kunnen digitaal worden geraadpleegd in het depot van de SEC, de Amerikaanse toezichthouder op de effectenbeurzen (EDGAR filings and forms). Het uiteindelijke databestand omvatte 488 observaties: 222 in periode 1997-2000 en 266 in periode 2002-2005.

De onderzoeksresultaten tonen aan dat na de invoering van de nieuwe regelgeving een veel hoger percentage van de overnemende ondernemingen melding maakt van gekochte goodwill. Deze conclusie is in lijn met hypothese 1, waarin wordt gesteld dat de nieuwe regelgeving resulteert in meer frequente rapportering van gekochte goodwill. Verder kwam uit het onderzoek naar voren dat in de periode na de invoering van de nieuwe regelgeving het relatieve bedrag van betaalde goodwill lager is dan in de periode ervoor. Zelfs wanneer rekening wordt gehouden met de bedrijfstak van de doelwitondernemingen (classificaties naar dienstverlening of technologie), blijft deze conclusie overeind. Deze uitkomsten ondersteunen hypothese 2, waarin wordt gesteld dat de gewijzigde regelgeving leidt tot een kernachtiger goodwill begrip, tot uitdrukking komend in een lager bestanddeel van de totale overnameprijs.

Een andere onderzoeksuitkomst was dat wanneer ondernemingen in hun verslaggeving afzonderlijk melding maken van immateriële vaste activa anders dan betaalde goodwill, de relatieve omvang van de betaalde goodwill lager is. Deze uitkomst levert bewijs voor hypothese 4, dat verslaggeving over bij overnames overgenomen immateriële vaste activa leidt tot een lager bedrag aan betaalde goodwill.

Het percentage meldingen van overgenomen immateriële vaste activa anders dan goodwill is in periode 1997-2000 lager dan in periode 2002-2005. Deze uitkomst ondersteunt hypothese 3, waarin wordt gesteld dat nieuwe regelgeving leidt tot een hoger percentage vermeldingen door de overnemende ondernemingen van de bij overnames overgenomen immateriële vaste activa. Een opmerkelijk onderzoeksresultaat is dat wanneer er in periode 1997-2000 melding wordt gemaakt van overgenomen immateriële vaste activa, de relatieve omvang ervan hoger uitkomt dan in periode 2002-2005. Sommige van de in periode 1997-2000 als overgenomen immateriële vaste activa opgevoerde posten blijken onder de gewijzigde regelgeving niet toegestaan (*workforce*) of mogen slechts onder strikte voorwaarden worden opgenomen (*In-Process Research and Development*). Deze bevindingen duiden erop dat de gewijzigde regelgeving mogelijk tot meer consistentie in de afzonderlijke vermelding van immateriële vaste activa heeft geleid.

De analyse van het gezamenlijke effect van de periode, de aanwezigheid van immateriële vaste activa en, als controlevariabelen de classificatie van de bedrijfstakken naar dienstverlening en technologie toont aan dat de nieuwe

regelgeving en de afzonderlijke vermelding van overgenomen immateriële vaste activa beide de betaalde goodwill negatief beïnvloeden. Deze uitkomsten zijn in lijn met hypothese 2: door de gewijzigde regelgeving is goodwill een kernachtiger begrip geworden, zoals blijkt uit een lager percentage dat het deel uitmaakt van de overnameprijs. Ook hypothese 4, waarin wordt gesteld dat de afzonderlijke vermelding van overgenomen immateriële vaste activa leidt tot een lager bedrag aan betaalde goodwill wordt door deze analyse ondersteund.

Concluderend kan worden gesteld dat de bovengenoemde resultaten aantonen dat de gewijzigde regelgeving de verslaggeving over goodwill krachtig heeft beïnvloed. Goodwill is een veel kernachtiger begrip geworden.

Deze onderzoeksresultaten kunnen een indicatie zijn dat door de nieuwe regelgeving het accounting goodwill begrip naar het economische goodwill begrip is toegegroeid. Dit vroeg om verder onderzoek van betaalde goodwill in de periode na invoering van de nieuwe regelgeving: kan betaalde goodwill worden gehanteerd als maatstaf voor waardecreatie, naast meer gebruikelijke maatstaven voor waardecreatie zoals buitengewoon rendement op aandelen?

Dit wordt nagegaan in het tweede onderzoek in deze dissertatie. Daarin wordt onderzocht of betaalde goodwill informatie bevat over de verwachte waardecreatie van die fusies en overnames. Daartoe worden hypothesen over waardecreatie van fusies en overnames getest op betaalde goodwill.

Eerst is een literatuurstudie gedaan naar overnametheorieën die een verklaring geven voor de bij overnames betaalde goodwill en is eerder empirisch onderzoek naar deze overnametheorieën bestudeerd. Een eerste voor de hand liggende theorie is de efficiëntie theorie. De efficiëntie theorie luidt dat overnames plaatsvinden om aandeelhouderswaarde te creëren. De nieuw te vormen bedrijfscombinatie zal productiever zijn dan de afzonderlijke ondernemingen bij elkaar opgeteld. Dit komt door synergievoordelen en verbeterde aansturing van de doelwitonderneming. Deze verwachte voordelen worden weergegeven door de voor de overname betaalde goodwill. Overnemende ondernemingen zijn immers bereid te betalen voor de verwachte waardecreatie die hieruit voortvloeit.

Een andere voor dit onderzoek relevante overnametheorie is de empire-building theorie. Daarnaast speelt een aantal andere determinanten een rol bij de verklaring van betaalde goodwill. De empire-building theorie stelt dat overnames worden gepland en uitgevoerd door het management van de overnemende onderneming om zo hun eigen belang in plaats van dat van hun aandeelhouders na te streven. Andere determinanten die de betaalde goodwill kunnen beïnvloeden zijn de onderhandelingsposities van de overnemende onderneming en de doelwitondernemingen en een verkeerde waardering van de overnemende onderneming of van de doelwitonderneming door de aandelenmarkt.

Deze theorieën zijn in diverse onderzoeken getest. Daarin werd meestal gebruik gemaakt van buitengewone rendementen op aandelen als te verkla-

ren variabele. In deze onderzoeken wordt bewijs geleverd voor de efficiëntie theorie, volgens welke overnames waardecreërend zijn. De onderzoeksresultaten ondersteunen echter ook de andere overnametheorieën. Concluderend kan worden gesteld dat naast de efficiëntie theorie ook andere overnametheorieën het buitengewoon rendement op aandelen verklaren.

In het onderzoek naar goodwill als maatstaf van waardecreatie dienen daarom naast de efficiëntie theorie ook de andere overnametheorieën in beschouwing te worden genomen. Het onderzoek naar betaalde goodwill bouwt verder op empirisch onderzoek waarbij de buitengewone rendementen op aandelen van de doelwitondernemingen of de overnamepremies als te verklaren variabelen werden gehanteerd. Daarbij wordt verondersteld dat betaalde goodwill zich overeenkomstig deze te verklaren variabelen ontwikkelt.

Het onderzoek naar betaalde goodwill als maatstaf voor waardecreatie van die overname leidt tot de *tweede onderzoeksvraag*:

(II) Geeft goodwill onder de nieuwe regelgeving informatie over de verwachte waardecreatie van de overname?

Deze tweede onderzoeksvraag wordt geoperationaliseerd in de volgende *deelvraag*:

(II) a Wat is onder de nieuwe regelgeving het effect van de karakteristieken van de efficiëntie theorie op betaalde goodwill?

De bijbehorende *hypothesen* luiden als volgt:

Hypothese 5: Hoe hoger de operationele synergie die uit een overname voortvloeit, des te hoger het bedrag van de betaalde goodwill zal zijn.

Hypothese 6: De door een overname gecreëerde financiële synergie heeft een positief effect op het bedrag van de betaalde goodwill.

Hypothese 7: Als een overname het management van een doelwitonderneming zal verbeteren, wordt een hoger bedrag aan goodwill betaald.

Zoals eerder vermeld, wordt in het onderzoek naar goodwill als maatstaf van waardecreatie ook rekening gehouden met de karakteristieken van andere theorieën die goodwill verklaren.

Karakteristieken van waardecreërende overnames (conform de efficiëntie theorie) en van andere theorieën die goodwill verklaren zijn verkregen uit eerder empirisch onderzoek naar deze theorieën, waarin zij werden getoetst op de buitengewone rendementen van de aandelen van de doelwitondernemingen en op overnamepremies. Zij staan in de onderstaande twee tabellen weergegeven.

Tabel S-1: Goodwill en waardecreatie: karakteristieken van de efficiëntie theorie

Waardecreatie uit	Karakteristieken	Effect op goodwill
Operationele synergieën	Onderlinge gerelateerdheid bedrijfsactiviteiten	Positief
	Relatieve omvang doelwitonderneming ten opzichte van overnemende onderneming	Negatief
Financiële synergieën	Verschil in leverage tussen doelwitonderneming en overnemende onderneming	Positief
Verbeterd management	Tobin's q of marktwaarde-boekwaarde ratio van de overnemende onderneming	Positief
	Tobin's q of marktwaarde-boekwaarde ratio van de doelwitonderneming	Negatief

Tabel S-2: Goodwill en waardecreatie: controle variabelen van andere theorieën

Andere factoren	Karakteristieken	Effect op goodwill
Empire-building	Percentage van de aandelen van de overnemende onderneming in handen van de directie van de onderneming	Negatief
	Percentage van de aandelen van de doelwitonderneming in handen van de directie van de onderneming	Negatief
	Leverage van de overnemende onderneming	Negatief
Bargaining	Betalingswijze: contant (kas)	Positief
	Vorm van de overname: tender offer	Positief
	Aantal bidders	Positief
	Weerstand tegen het bod (vijandig bod)	Positief

Het tweede onderzoek maakt gebruik van dezelfde steekproef van fusies en overnames als het eerste onderzoek in deze dissertatie. Het tweede onderzoek richt zich uitsluitend op de overnames die plaatsvonden in de periode 2002-2005, na invoering van de nieuwe verslaggevingregelgeving. Voor dit verdere onderzoek zijn van deze steekproef van fusies en overnames aanvullende gegevens opgevraagd uit de databestanden Compustat (jaarrekeningcijfers) en CRSP (aandelenkoersen).

Het onderzoek naar betaalde goodwill als maatstaf voor waardecreatie van overnames is uitgevoerd in drie stappen.

Allereerst zijn correlaties uitgevoerd tussen de voor de overnames betaalde goodwill en de buitengewone rendementen op de aandelen van de overnemende onderneming, de doelwitonderneming en de combinatie van beide rondom de overname-aankondiging. Bij de berekening van de buitengewone rendementen is gebruik gemaakt van vijf verschillende tijdsintervallen, variërend van de dag van de overname-aankondiging zelf tot een tijdsinterval van vijf dagen voor tot vijf dagen na de overname-aankondiging.

Vervolgens zijn in bivariate analyses de karakteristieken van waardecreërende overnames alsmede de karakteristieken van de andere overnametheorieën gecorreleerd met de aan goodwill betaalde bedragen. Bovendien zijn voor wat betreft de dummy variabelen afzonderlijke t-tests op goodwill uitgevoerd.

Tenslotte zijn multivariate regressies van betaalde goodwill op deze karakteristieken uitgevoerd. De betaalde goodwill is daarbij de verklarende variabele.

Sommige karakteristieken uit de tabellen konden niet in beschouwing worden genomen in dit onderzoek. Dit kwam doordat het aantal observaties te laag was, of doordat een bepaalde gebeurtenis te weinig voorkwam. De karakteristieken die dit betreft zijn: het percentage van de aandelen van de doelwitonderneming in handen van de directie van de onderneming, het aantal bieders, en of er sprake is van weerstand tegen het bod.

De resultaten van de correlaties tussen de betaalde goodwillbedragen en de buitengewone rendementen op aandelen rondom de overname-aankondiging tonen dat in vier van de vijf tijdsintervallen de correlatie-coëfficiënten van de buitengewone rendementen op aandelen van de doelwitondernemingen en de overnemende ondernemingen op betaalde goodwill significant zijn (p -waarde $< 0,01$). Conform verwachting zijn de correlatie-coëfficiënten van de betaalde goodwill met de buitengewone rendementen op aandelen van de doelwitondernemingen positief. De correlatie-coëfficiënten van de betaalde goodwill met de buitengewone rendementen op aandelen van de overnemende ondernemingen zijn negatief. Hoewel de correlatie-coëfficiënten van de betaalde goodwill met de buitengewone rendementen voor de combinatie van beide slechts in twee van de vijf tijdsintervallen significant zijn, vormt dit negatieve verband een indicatie dat de waardecreatie van beide lager is naarmate de betaalde goodwill hoger is. Dit negatieve verband duidt erop dat ook andere factoren dan uitsluitend waardecreatie goodwill verklaren.

De bivariate analyses van het verband tussen de relatieve omvang van de betaalde goodwill en de karakteristieken van waardecreërende overnames (conform de efficiëntie theorie) tonen een aantal significante uitkomsten die in lijn zijn met de verwachtingen. Zo ondersteunt de gevonden positieve correlatie tussen de betaalde goodwill en het verschil in *leverage* tussen de doelwitonderneming en de overnemende onderneming de veronderstelling dat er een positief verband bestaat tussen door de overname behaalde financiële synergie en betaalde goodwill. Het negatieve verband tussen de relatieve omvang van de doelwitonderneming ten opzichte van de overnemende onderneming en betaalde goodwill is in overeenstemming met de veronderstelling dat het voordeel van operationele synergie hoger is naarmate de doelwitonderneming kleiner is ten opzichte van de overnemende onderneming, omdat er dan meer mogelijkheden voor operationele synergie-effecten zijn. Ook het negatieve verband tussen betaalde goodwill en over-

names met kwalitatief slecht management bij zowel de overnemende onderneming als bij de doelwitonderneming zoals uitgedrukt door Tobin's q stemt overeen met de verwachtingen. Dergelijke overnames verbeteren immers niet de kwaliteit van het management van een doelwitonderneming en er treedt derhalve geen waardecreatie op.

Sommige verbanden tussen waardecreatie en betaalde goodwill zijn anders dan verwacht. Zo is er het negatieve verband tussen betaalde goodwill en overeenkomst in bedrijfstakken van de overnemende ondernemingen en de doelwitondernemingen. Dit verband duidt er mogelijk op dat het verwachte effect van een groter voordeel uit operationele synergie bij overnames binnen dezelfde bedrijfstak minder zwaar weegt dan het effect van *empire-building* gedrag, waarbij het management van de overnemende onderneming bij voorkeur overnames buiten de eigen bedrijfstak doet, om zo diversificatie te bewerkstelligen.

Ook het positieve verband tussen betaalde goodwill en overnames van doelwitondernemingen met kwalitatief goed management door overnemende ondernemingen met kwalitatief slecht management zoals uitgedrukt door Tobin's q is anders dan verwacht. Toch kunnen dergelijke overnames als waardecreërend worden beschouwd, wanneer wordt verondersteld dat de overdracht van managementkwaliteit ook van de doelwitonderneming naar de overnemende onderneming kan plaatsvinden.

De bivariate analyse toont aan dat naast de karakteristieken van waardecreatie ook andere karakteristieken gerelateerd zijn aan de omvang van de betaalde goodwill. Hieronder vallen de leverage ratio van de overnemende onderneming, de betalingswijze voor de overname en de vorm van de overname.

De multivariate regressie-analyses van goodwill als maatstaf voor waardecreatie zijn achtereenvolgens uitgevoerd zonder en met controle-variabelen voor andere overnametheorieën en factoren. Verder zijn de regressies achtereenvolgens uitgevoerd met het aantal observaties dat informatie bevat over de in de regressies meegenomen karakteristieken en met alle observaties, waarbij wordt gecorrigeerd voor ontbrekende variabelen.

De uitkomsten van de regressies zonder controle-variabelen tonen aan dat overeenkomstig de verwachting de aanwezigheid van financiële synergieën, blijkend uit een verschil in *leverage* tussen doelwitonderneming en overnemende onderneming, leidt tot een hoger bedrag aan betaalde goodwill. Deze uitkomsten ondersteunen hypothese 6, waarin wordt gesteld dat de door een overname gecreëerde financiële synergie een positief effect heeft op het bedrag van de bij de overname betaalde goodwill. Deze regressies tonen verder een positief effect aan op betaalde goodwill van overnames van doelwitondernemingen met kwalitatief goed management door overnemende ondernemingen met kwalitatief slecht management zoals uitgedrukt door Tobin's q . Het verwachte positieve effect van een kwaliteitsverbetering van het management van de doelwitonderneming door de overname door kwalitatief hoogwaardig management van de overnemende onderneming,

blijft in dit onderzoek uit. De onderzoeksresultaten ondersteunen niet hypothese 7, waarin wordt gesteld dat bij een overname een hoger bedrag aan goodwill wordt betaald als deze het management van een doelwitonderneming verbetert. Ze sluiten echter niet uit dat er toch kwaliteitsverbetering van het management optreedt door overnames, zij het in een omgekeerde richting: van de doelwitondernemingen naar de overnemende ondernemingen.

Het effect kan echter ook worden verklaard uit de *empire-building* theorie. Het kwalitatief slechte management van de overnemende onderneming kan immers haar eigen belangen nastreven door ondernemingen met een kwalitatief goed management en goede prestaties over te nemen. Men kan bereid zijn hier een hoge prijs voor te betalen.

Ook bij inachtneming van de controle-variabelen blijft het positieve effect van financiële synergie op betaalde goodwill aanwezig. Deze uitkomsten zijn in lijn met hypothese 6.

De regressies van goodwill op alle observaties met correcties voor ontbrekende variabelen en met inachtneming van de controle-variabelen tonen de meest significante uitkomsten. Bij deze regressies is sprake van een positief effect op betaalde goodwill van overnames van doelwitondernemingen met kwalitatief goed management door overnemende ondernemingen met kwalitatief slecht management zoals uitgedrukt door Tobin's *q*. Verder tonen de uitkomsten, anders dan verwacht, een significant negatief effect van gerelateerdheid van de bedrijfsactiviteiten op betaalde goodwill. Waar een positief effect zou hebben geduid op operationele synergieën en hypothese 5 zou hebben ondersteund, kan dit negatieve effect juist duiden op de aanwezigheid van *empire-building* gedrag bij het management van de overnemende onderneming: het management van de overnemende onderneming gaat dan bij voorkeur overnames buiten de eigen bedrijfstak aan, om zo diversificatie te creëren. Een aantal regressies toont verder, in overeenstemming met de verwachtingen, een significant negatief effect van de relatieve omvang van de doelwitonderneming op de betaalde goodwill. Voor een doelwitonderneming zijn immers de mogelijkheden tot operationele synergievoordelen hoger, naarmate deze kleiner is dan de overnemende onderneming. Dit is in overeenstemming met hypothese 5, waarin wordt gesteld dat naarmate de operationele synergie die uit een overname voortvloeit hoger is, het bedrag van de bij de overname betaalde goodwill ook hoger is.

Speciale aandacht verdient het positieve effect van de *leverage* van de overnemende onderneming op de betaalde goodwill. De verwachting was dat een hogere *leverage* door haar disciplinerende werking de beslissingsvrijheid van het management van de overnemende onderneming zou hebben beperkt en dus het risico van te hoge overnameprijzen zou tegengaan, met als gevolg een lager bedrag aan betaalde goodwill. De uitkomsten wijzen erop dat mogelijk een andere verklaring hier overheerst. Volgens deze verklaring beperkt een hogere financiële *leverage* de beslissingsvrijheid van het management van de overnemende onderneming, waardoor dit manage-

ment meer geneigd is tot waardecreërende overnames, blijkend uit hogere bedragen aan betaalde goodwill.

Uit de uitkomsten van dit onderzoek komt naar voren dat financiële synergieën en gedeeltelijk ook operationele synergieën een positief effect hebben op de omvang van de bij overnames betaalde goodwill. Deze resultaten ondersteunen hypothese 5 en hypothese 6. Wanneer wordt verondersteld dat de verbetering van het management ook van de doelwitonderneming naar de overnemende onderneming kan worden overgedragen, toont het onderzoek mogelijk ook een positief effect van verbetering van managementkwaliteit op betaalde goodwill. Ofschoon deze uitkomst hypothese 7 niet ondersteunt, duidt zij wel op een positief effect van een verbetering van het management van de overnemende onderneming door de overname op betaalde goodwill.

Deze uitkomsten houden stand wanneer rekening wordt gehouden met andere verklaringen voor de betaalde goodwill, zoals *empire-building* motieven en onderhandelingsposities van de overnemende onderneming en de doelwitonderneming.

Ter beantwoording van de twee onderzoeksvragen kan op basis van het onderzoek worden geconcludeerd dat door de nieuwe regelgeving de bij overnames betaalde goodwill een kernachtiger begrip is geworden. Verder komt uit het onderzoek naar voren dat de betaalde goodwill elementen van waardecreatie bevat: karakteristieken van waardecreërende overnames hebben een positief effect op betaalde goodwill. Deze conclusie blijft overeind wanneer naast karakteristieken voor waardecreatie karakteristieken van *empire-building* en onderhandelingsposities als controle-variabelen in het onderzoek in beschouwing worden genomen. Verder kan worden geconcludeerd dat ook *empire-building* en onderhandelingsposities van de overnemende onderneming en het doelwit van invloed zijn op de betaalde goodwill.

In antwoord op de centrale vraag, kan worden geconcludeerd dat de gewijzigde regelgeving inderdaad de accounting goodwill nader tot het economische goodwill begrip heeft gebracht. Bij de economische goodwill benadering wordt goodwill beschouwd als de contante waarde van de verwachte overwinsten die voortvloeien uit de acquisitie. De onderzoeksresultaten tonen aan dat onder de gewijzigde regelgeving de voor een overname betaalde goodwill als een maatstaf voor waardecreatie kan dienen, ofschoon ook andere factoren, zoals de onderhandelingspositie van de overnemende onderneming en het doelwit en *empire-building* van het management van de overnemende onderneming het bedrag van betaalde goodwill bepalen.

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Curriculum Vitae

Maaïke Lycklama à Nijeholt werd geboren op 25 oktober 1968 te Amsterdam. In 1987 slaagde zij voor het eindexamen VWO aan College Hageveld te Heemstede. Van 1988 tot 1994 studeerde zij Financiële Economie aan de Vrije Universiteit te Amsterdam. Tijdens haar studie werkte zij enige jaren als student-assistent bij de vakgroep financiering van deze universiteit. Na het behalen van haar doctoraal diploma in 1994 werkte zij enige tijd als onderzoeksassistent op de afdeling aandelenresearch van de investeringsbank MeesPierson te Amsterdam. Deze functie combineerde zij met die van toegevoegd docent aan de Vrije Universiteit te Amsterdam. In 1995 trad zij in dienst als universitair docent bij het Economisch Instituut van de Universiteit Utrecht. Zij behaalde daar haar basiskwalificatie onderwijs. In 2000 vervulde zij deze functie voor die van universitair docent bij het Centrum voor Bedrijfswetenschappen van de Universiteit Leiden. Daar startte zij haar onderzoek naar goodwill en waardecreatie van overnames. Naast haar onderzoek is Maaïke betrokken bij het onderwijs en de examinering van vakken op het terrein van bedrijfseconomie, financieel management en ondernemingsfinanciering. Ze is getrouwd met Peter Kasteleyn en heeft twee kinderen: Emma en Siebren.

Maaïke Lycklama à Nijeholt was born on October 25, 1968 in Amsterdam, The Netherlands. She attended grammar school at College Hageveld in Heemstede from 1981 to 1987. Starting in 1988, she studied Financial Economics at VU University Amsterdam and obtained her masters degree in 1994. During her study she served as assistant for the department of finance of VU University. In 1994 she started as assistant researcher at the equity research department of investment bank MeesPierson. She combined this function with a lecturer position at VU University. From 1995 to 2000 she worked as an assistant professor for Utrecht University. During her almost six year employment at Utrecht University she obtained a designation in lecturing. Since September 2000, Maaïke is employed at the Center of Business Studies of Leiden University. This is where her research into goodwill and value creation of acquisitions has started. Maaïke lectures business administration, corporate finance and financial management. She is married to Peter Kasteleyn and she has two children: Emma and Siebren.

In de boekenreeks van de Graduate School of Legal Studies van de Faculteit der Rechtsgeleerdheid, Universiteit Leiden, zijn in 2009 en 2010 verschenen:

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