Tjalling C. Koopmans Research Institute

Discussion Paper Series nr: 12-22

COMPARING GOODWILL BEFORE AND AFTER THE CHANGES IN US GAAP IN 2001

M.P.Lycklama à Nijeholt
Y.K.Grift
J.M.J. Blommaert

Universiteit Utrecht

Utrecht School of Economics

Tjalling C. Koopmans Research Institute
Utrecht School of Economics
Utrecht University

Kriekenpitplein 21-22
3584 EC Utrecht
The Netherlands
telephone +31 30 253 9800
fax +31 30 253 7373
website www.koopmansinstitute.uu.nl

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How to reach the authors

Please direct all correspondence to the first author.
Dr. M.P.Lycklama à Nijeholt
Leiden Law School
Institute for Tax Law and Economics
Department of Business Studies
Kamerlingh Onnes Gebouw
Steenschuur 25
2311 ES Leiden
The Netherlands.
e-mail: m.p.lycklama@law.leidenuniv.nl
Dr. Y.K.Grift
Utrecht University
Utrecht School of Economics
Kriekenpitplein 21-22
3584 TC Utrecht
The Netherlands.
E-mail: y.grift@uu.nl
Prof. Dr. J.M.J. Blommaert
Tilburg University
PO Box 90153
5000 LE Tilburg
The Netherlands.
E-mail: j.m.j.blommaert@tilburguniversity.edu

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M.P.Lycklama à Nijeholt[a]
Y.K.Grift[b]
J.M.J. Blommaert[c]

[a]Leiden Law School
Leiden University

[b] Utrecht School of Economics
Utrecht University

[c] Financial Accounting
Tilburg University

August 2012

Abstract

This study examines whether the introduction of SFAS 141 "Business Combinations" (2001) and SFAS 142 "Goodwill and other Intangible Assets" (2001) has led to more precise information about accounting goodwill in the financial statements of acquirers. Acquisitions in the period 1997-2005 between US stock exchange listed companies were studied. The results show that after the introduction of new regulation the relative amount of accounting goodwill (59,8% of the purchase price) is lower when compared to relative accounting goodwill in the period before (67,6% of the purchase price). Moreover, more acquiring companies reported on intangibles under the new regime. Correcting for industries of the target companies, the total combined effect of the new accounting regime and reporting on intangible assets on relative goodwill is significant and negative. However, the effect of the new regime is limited for companies that separately report on acquired intangible assets. Apparently, this type of company is already accurately reporting. The results indicate that the changes in regulation have made goodwill a more concise concept; thereby bringing accounting goodwill and economic goodwill closer together.

Keywords: Goodwill, Mergers and Acquisitions, SFAS 141, SFAS 142, Value Creation

JEL classification: G34, M41, M48

1 INTRODUCTION

Reporting on purchased goodwill in business combinations attracts a great deal of attention. An 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].[1] Due to the introduction of SFAS 141 "Business Combinations" and of SFAS 142 " Goodwill and Other Intangible Assets"[2], 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 (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 goodwill[3] 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 containing information about expected value creation or synergy of the acquisition.

This would correspond to the intentions of the standard-setting bodies in drafting the new rules: they expect that under the new standards, the financial statements will better reflect the underlying economics of the acquired goodwill.[4]

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 excess profits from the acquisition,

[1] Recently, accounting regulation regarding reporting on business combinations was further modified. In November 2007, FASB issued a revised SFAS 141 'Business Combinations' (SFAS 141R). SFAS 141R is 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] SFAS 141 (2001) superseded APB Opinion No. 16 "Business Combinations" (1970). SFAS 142 (2001) superseded APB Opinion No. 17 "Intangible Assets" (1970).

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

[4] SFAS 142, 2001, summary, 2.

including synergies. This study takes a first look at examining the effect of the new regulation standards on the amount of purchased goodwill in relation to the total purchase price for the acquisition.[5] This question is answered by comparing information on purchased goodwill amounts before and after new regulation, thereby taking into account the differences between industries and reporting on intangibles other than goodwill. Based on available information, at this time the effect of regulatory changes on the relative amount of reported goodwill has not been investigated. This is addressed in this study.

This research relates purchased goodwill in an acquisition to the value of the transaction of that acquisition. Previous research was focused mostly on goodwill as recorded on the balance sheet of a company.[6] As this goodwill was related to the market value of that company, the focus was on goodwill related to (the size of) the acquiring company instead of to (the amount paid for) the acquisition. Moreover, this recorded goodwill was often made up by several acquisitions by that company in the past. Another specific aspect of this research is that in contrast to previous research, purchased accounting goodwill is now used as a variable to be explained instead of as an explanatory variable.

Noteworthy is that the collected goodwill data is unique in its kind, as in conventional databases no information is available on purchased goodwill amounts at this level of detail.

The research is demarcated to mergers and acquisitions between US publicly quoted companies, to which US GAAP apply. Reported purchased goodwill in acquisitions that were announced and completed in the period after the introduction of the new rules was compared to reported purchased goodwill in acquisitions that were announced and completed in the period before. It was investigated whether the new regulation affected reporting on goodwill and, if so, whether the changes in reporting on mergers and acquisitions due to this new regulation resulted in a more concise term of goodwill, comprising a lower component of the purchase price for the acquisition.

The results of the research show that after new regulation came into force, a much larger percentage of companies reported on purchased goodwill: notification of goodwill rose by

[5] In a follow up research to be presented at the general meeting of the American Accounting Association in 2012 it is tested whether goodwill under the new accounting regime does reflect underlying economics and therefore provides information on expected value creation of the acquisition.

[6] See for instance Barth and Clinch (1996), Bugeja and Gallery (2006), Chauvin and Hirshey (1994), Henning et al. (2000), Jennings et al. (1996), McCarthy and Schneider (1995), and Shahwan (2004).

53%.[7] 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: we observe a decrease of 12%.[8] Moreover, the results indicate that the separate disclosure of intangible assets in addition to goodwill negatively affects the amount of goodwill. Compared to acquiring companies in the period after the introduction of new regulation, in the period before the introduction of new regulation only a limited number of acquiring companies recognize intangible assets other than purchased goodwill. Under the old regime, 54% of the acquirers reported acquired intangible assets. After the introduction of the new regulations this percentage rose to 87%. The analysis of the impact of the combined effect of the new regulation, reporting on intangible assets and, as control variables, industry classifications into services and technology on goodwill shows that the new regulation and the reporting on other intangible assets negatively influence goodwill. Especially the separate impact of new regulation and reporting on intangibles on the amount of relative goodwill is strongly negative. The results indicate that the changes in regulation influence reporting on purchased goodwill. Goodwill seems to have become a more concise concept.

The structure of this working paper is as follows: Section 2 provides the different definitions of goodwill. In section 3, the significant features of the changed US GAAP regarding financial reporting affecting goodwill are specified in more detail. In this section, the theoretical framework is developed. Section 4 describes the research design. Section 5 contains a discussion of the results of the research. This article closes with the conclusions in section 6.

2 DEFINITIONS OF GOODWILL

Commonly, goodwill is regarded as the present value of the excess profits the acquiring company is expecting to gain in the future resulting from the acquisition.[9] These excess profits arise from a "favourable 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. The new business combination can profit from these characteristics. This advantage may also run the other way: from

[7] From 46,3% in the old regime to 71% in the new regime.
[8] From 67,6% in the old regime to 59,8% in the new regime.
[9] See for instance Johnson and Tearney (1993, 59), and Myers (1977, 47).

acquirer to target. Further, additional profits are derived from synergies, such as economies of scale or technical and managerial skill transfer. This approach of goodwill is called the economic concept of goodwill. Johnson and Tearney (1993, 59) describe it as the excess profits approach of goodwill. According to these authors, this concept is difficult to measure since future earnings have no certainty. In this context Myers (1977) 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[10]

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 value[11] of the acquired firm. In other words, the accounting concept of goodwill can be described as the price paid in addition to the shareholders' equity as shown on 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 of 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: the leftover component of accounting goodwill that cannot be allocated to the three other components of accounting goodwill. It results from 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

[10] In this way, he specifies a direct operationalization of the concept of economic goodwill.
[11] i.e. the reported value of the target's assets less liabilities except for goodwill.
[12] Johnson and Tearney, 1993, 59.

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."

Of the various components of accounting goodwill, the synergy component of goodwill has the most in common with economic goodwill. In the next section, the expected impact of the new rules on accounting goodwill, maybe bringing it more closely aligned with economic goodwill, will be discussed in more detail.

3. NEW REGULATION AFFECTING REPORTING ON PURCHASED GOODWILL: FEATURES, ARGUMENTS, AND HYPOTHESES

In this section, the significant features of the changed US GAAP (effective since 2001) regarding financial reporting affecting goodwill are specified in more detail.[13] Further, the motives for these changes are discussed, as well as their expected effect on goodwill.

Purchase method for all business combinations

Whereas APB Opinion No. 16 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 interests and thus applied the pooling of interests method, and entering purchased goodwill as an asset for all other business combinations that had to apply the purchase method], under SFAS 141, all business combinations must be accounted for using the purchase method only, in which goodwill has to be entered as an asset.[14] Other methods are no longer permitted. Requiring the purchase method as the only method means that it is implicitly assumed that virtually all business combinations are acquisitions.[15] The standard prescribes for all business combinations that the acquirer recognizes the target's identifiable assets and liabilities at their fair values[16] at the acquisition date, and also recognizes purchased goodwill.[17] SFAS 141 even gives general guidance for determining the fair values of assets acquired and liabilities assumed, other than goodwill.[18]

[13] The relevant standards are: SFAS 141: Business Combination (2001), and SFAS 142: Goodwill and other Intangible Assets (2001).
[14] See SFAS 141-13 (2001) for more details. Some minor exceptions are made in SFAS 141: 9-12 (2001).
[15] SFAS 141, 2001, summary.
[16] In case of the pooling method, companies were not required to record the assets and liabilities at fair value.
[17]See SFAS 141-13 (2001), SFAS 141-35 (2001).
[18] SFAS 141-37, 2001.

Reasons for allowing only the purchase method are[19] (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.

Annual impairment test replaces amortization

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. 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.[20] As goodwill cannot generate cash inflows independently from those of 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 exceeds its fair value, an impairment of goodwill against income is required.

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. The underlying thought is that it is no longer presumed that goodwill is a wasting asset: goodwill is assumed to have an indefinite life.[21] [22]

The standard-setting body expects 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.[23]

[19] These reasons were derived from SFAS 141, 2001

[20] SFAS 142-18, 2001; SFAS 142-26, 2001.

[21] SFAS 142, 2001, summary.

[22] Another objective of the standard-setting body was to prohibit the pooling of interest method, as it did not show any information about the amount of purchased goodwill at all. By replacing amortization of goodwill by an annual impairment test of goodwill, a disadvantage of the purchase method when compared to the pooling-of-interest method (lower profits due to amortization of goodwill) disappears. Companies that previously applied the pooling of interest method in takeovers were now prepared to apply the purchase method instead.

[23] SFAS 142, 2001, summary, 2.

When the new SFAS 141 and 142 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 should expire.[24] In addition, the impairment test should lead to a comparison of the carrying amount of 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 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.

These changes result in hypotheses 1 and 2.
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.

Acquired intangible assets must be recorded separately

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.[25] SFAS 141 addresses SFAS 142 'Goodwill and Intangible Assets', which has tightened up the requirements regarding the recognizing of acquired intangible assets in the financial

[24] 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.
[25] SFAS 141-39, 2001.

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. 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. An intangible item meets the identifiability criterion when it is separable from the firm, or when it arises from contractual or other legal rights. 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. Examples of future economic benefits following from an intangible asset may be revenues from the sale of products or services, or cost savings.
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. 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.[26]

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.[27]

We expect that the more strict regulation regarding the separate reporting on purchased identifiable intangible assets, as explained by a number of examples, will lead to more frequent reporting on acquired intangible assets and will further reduce the amounts of purchased goodwill. These intangibles will no longer be accounted for as part of goodwill.

These changes result in hypotheses 3 and 4.

[26] SFAS 142-9, 2001.
[27] SFAS 142, 2001, summary, 7.

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.

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.

[Insert Figure 1 here]

Figure 1 provides an overview of the theory developed in this section, and summarizes how the new standards theoretically must have refined the recorded goodwill to a more accurate indicator. It 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 circumstances[28], the recorded goodwill should show the synergy component of goodwill and the going-concern component of goodwill. The FASB seemed to have had this in mind as well when it 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

[28] i.e. all other intangible items are recorded separately and no overpayment occurs.

understanding of the resources acquired and improve their ability to assess future profitability and cash flows.[29]

4 RESEARCH DESIGN

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. Choosing three years before 2001 and three years after 2001 provides enough observations of mergers and acquisitions to perform an empirical analysis. 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 observations 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

[29] SFAS 141, Summary, 2001, 7.

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.

Information about purchased goodwill amounts, and acquired intangible assets numbers 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).

Regarding data on goodwill, from 389 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.[30]

Nine observations were removed because no information was available on the value of transaction of the acquisition. Moreover, eleven cases were precluded because of outliers on the transaction values or on relative amounts of goodwill. The 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.

Table 1 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.

[Insert Table 1 here]

[30] 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 values of transaction, were precluded from further research.

Data on goodwill was derived by our 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 is unique in its kind, as in conventional databases no information is available on purchased goodwill amounts. The measure of relative goodwill was derived by dividing the amount of purchased goodwill by the value of transaction of the acquisition. Table 3 displays an average amount of purchased goodwill of $603 million. It further shows that goodwill amounts to 63 percent of the value of transaction of the acquisition of about $961 million.

Size does matter when analyzing goodwill. Taking into account the size of the acquisition can be done in two different ways. The first method is to include the purchase price (value of transaction) in the explanation of the amount of goodwill. The value of transaction is then added as an explanatory variable, whereas goodwill is the dependent variable. Another method is to analyze the amount of goodwill related to the value of transaction (relative goodwill), instead of the absolute amount of goodwill. In this research the latter method is chosen.

The value of transaction is used as the measure for the purchase price of the acquisition. 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.[31]

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

[31] The value of transaction is a uniform measure of the price paid for the acquisition. The purchase price for the acquisition as mentioned in the notes to the financial statements could have been an alternative measure for calculating relative goodwill: acquiring companies present purchased goodwill amount and purchase prices together, thereby using the same accounting techniques, which may make these concepts match nicely. However, during the searching for the purchase price in the notes to the financial statements, differences between companies were observed in their estimation of the purchase price.

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." [32]

Figure 2 represents two different scatter diagrams corresponding to absolute and relative goodwill amounts. These relative amounts were derived by dividing the purchased goodwill amounts by the value of transaction of the acquisition.

They are about scatters of goodwill with value of transaction, and relative goodwill with value of transaction, respectively. The scatter diagrams show balanced distribution of the variables, indicating that there are no more outliers and that the sample forms a solid basis for further research.

As expected, scatter diagram 2-a shows a positive relationship between goodwill and value of transaction. Scatter diagram 2-b shows the relationship between relative goodwill and value of transaction. The scatter diagrams show some high relative goodwill amounts (>1), especially occurring in relatively small acquisitions. This can be explained by the fact that research and development investments are to be charged immediately on the income statement. For small companies in their development stage this can lead to small or even negative amounts of equity and therefore high relative amounts of goodwill.

Although goodwill increases with value of transaction, goodwill as a percentage of value of transaction is not constant (relative goodwill). This variation gives rise to further research into the contents of goodwill.

[Insert Figure 2 here]

One of the explanatory variables is the availability of information on other purchased intangibles. Like the information on 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 3 it turns out that in 351 cases of the 488 observations mentioning goodwill, information about other acquired

[32] Source: variables list SDC Platinum.

intangibles is also provided (72 percent). The amount of intangible assets averages $ 239 million. In this research reporting on intangibles as such is taken into consideration, not the amount of the intangibles reported. Reporting on acquired intangibles is viewed as a signal of transparency of the acquiring company about the acquisition: it may indicate a more precise allocation of the purchase price to the different assets and liabilities of the target company, resulting in a more concise concept of goodwill.

Figure 3 shows the relationship between the total intangibles and the value of transaction. From scatter diagram 3.a, it can be concluded that intangibles increase with the value of transaction. Scatter diagram 3.b displays the relationship between goodwill as a percentage of value of transaction and the value of transaction. Intangibles as a percentage of value of transaction show variation. The scatters demonstrate that no outliers occur.

[Insert Figure 3 here]

Another explanatory variable for purchased goodwill is the industry the target is in. Table 2 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'.[33] It turns out that 37 percent of the targets are from services industries, and 46 percent from technology industries.[34]

To control for the economic situation, the S&P 500 index closing price on the announcement date of the acquisitions[35] is added as an indicator for the market trends. On average, the S&P 500 index equals 1155.95.

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

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

[35] In 14 out of 488 observations, the announcement date occurred in the weekend. For those cases, the S&P 500 index on the next trading day (closing price) was used.

5 RESULTS

In this section, the results of several analyses with respect to goodwill are discussed. First, relative amounts of goodwill in the time periods 1997-2000 and 2002-2005 are compared. Then, relative goodwill amounts are compared when classified into the presence of intangibles. Finally, by performing regression analyses, the combined effect of the characteristics on goodwill is examined.

As expected the new regulation results in more frequent reporting on purchased goodwill (hypothesis 1). Table 2 illustrates the number of observations that remained after implementing the selection criteria regarding availability of data on goodwill and transaction value and after removing outliers. 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 percent of the acquiring companies reported on purchased goodwill compared to 71 percent of the acquiring companies in 2002-2005: an increase of 36 percentpoint (a 54% increase). 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 (χ^2 = 54.858, p-value = 0.000).

[Insert Table 2 here]

Moreover, the new regulation results in a more concise term of goodwill, comprising a lower component of the total purchase price for the acquisition (hypothesis 2). All 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 came 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 came into force). Table 3 shows that whereas in the time period 1997-2000, relative goodwill on average accounted for 68 percent of the purchase price, in 2002-2005 this percentage decreased to about 60 percent on average. Relative goodwill in the time period 2002-2005 is statistically significant lower when compared to relative goodwill in the time period 1997-2000 (p-value=0.009).

[Insert Table 3 here]

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. The second panel in Table 3 compares relative goodwill in the different time periods, when the industries of the acquisition targets are classified into services and no services. As expected, relative goodwill in the services industries is relatively high in relation to relative goodwill in other industries; both before the change in regulations (1997-2000; p-value=0.000) and thereafter (2002-2005, p-value=0.001).The results show that relative goodwill decreased significantly in the services industries (p=0.002). In the third panel of Table 3 the industries of the acquisition targets are classified by technology. A similar result emerges. In line with expectations, it appears that in both time periods relative goodwill 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). The results show that relative goodwill also decreased significantly in the technology industries (p-value=0.009).

To conclude, after controlling for the target's industries, relative goodwill is lowered for the time period 2002-2005 when compared to that of 1997-2000, although in the no-services and no-technology industries these differences are only significant at the 10 percent level. Apparently goodwill has become a more concise term.

After the change in regulations the amount of goodwill would have been substantially influenced by the separate reporting of intangible assets.

Table 4 shows relative goodwill amounts in the time periods 1997-2000 and 2002-2005, when acquiring companies are classified into (a) no reporting and (b) reporting on intangible assets; that is apart from reporting on purchased goodwill. First it shows that in the time period 2002-2005, the reporting rate on intangibles increased when compared to the time period 1997-2000 (hypothesis 3). Whereas in 1997-2000, 54 percent of the acquiring companies reported on acquired intangible assets, in 2002-2005 87 percent of the acquiring companies mentioned these assets; an increase of 33 percentage points. 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 (χ^2 =67.71, p-value = 0.000).

It is expected that separate disclosures of intangible assets apart from goodwill contribute to lower amounts of purchased goodwill (hypothesis 4). 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. In 1997-2000 compared to companies that don't report on other intangibles relative goodwill is significantly lower for companies that do mention other intangibles (p-value=0.022). Regarding the time period 2002-2005, the average relative goodwill amounts are surprising: the average amount of relative goodwill turns out to be higher (p-value=0.066) in the case of separate reporting on intangible assets when compared to no mention of intangible assets. 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) confirms this 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 is confirmed by the difference (p-value=0.002) 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 intangible assets lead to a lower amount of relative goodwill in the time period 2002-2005 when compared to that of 1997-2000 (p-value=0.411).

Summarizing, hypothesis 4, which states that reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill, is supported by the outcomes for the time period 1997-2000. No support for this hypothesis can be found on the basis of the outcomes for 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.

[Insert Table 4 here]

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.

The corresponding general model is as follows:

$$relative\ goodwill = \alpha + \beta_1 D_{regulation} + \beta_2 D_{\mathrm{int}\,angibleassets} + \beta_3 D_{\mathrm{int}\,angibleassets} \cdot D_{regulation} + \beta_4 D_{services} + \beta_5 D_{techno\log y} + \beta_6 D_{services} \cdot D_{techno\log y} + \beta_7 S\,\&\,P500 + \varepsilon$$

relative goodwill = goodwill related to the value of the transaction of the acquisition;

$D_{regulation}$ = dummy variable set to one if the acquisition is announced and effective in time period 2002-2005, so after new regulation came into force;

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

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

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

S&P 500 = the S&P 500 index closing price on the announcement date of the acquisitions

Column (1) of Table 5 shows the results of regressing relative goodwill on regulation, reporting on other intangible assets and, as control variables, classification into services and technology. Relative goodwill turns out to be significantly negative determined by new regulation and by reporting on acquired intangible assets apart from goodwill. In addition, relative goodwill is positively influenced by the classification of the industries into services and into technology. Column (2) represents the results of the regression of relative goodwill when two interaction variables are added: one for the interaction between regulation and reporting on intangible assets apart from goodwill and the other for the interaction between industry classifications. The effect of the new regulation on relative goodwill remains significant and negative for firms not reporting on acquired intangibles. The results further show that in the period 1997-2000 acquiring firms that disentangle acquired goodwill from acquired intangible assets by separately reporting on those acquired intangible assets, show significantly lower relative amounts of goodwill when compared to companies that do not report on separately acquired intangible assets. An explanation for this may be that these separately reported intangibles are not accounted for as part of goodwill, which results in lower relative goodwill amounts for companies that do report on acquired intangible assets.

However, for firms reporting on acquired intangibles the effect of the new regulation is significantly positive (+0.186), and the total effect of new regulation and reporting on acquired intangible assets is zero.[36] An explanation for these 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. Whereas under the old regime separately reporting on acquired intangible assets has a disciplining effect on the relative amount of acquired goodwill (by then only 54% of the acquiring companies separately report on acquired intangible assets), this effect does not occur under the new regime. Under the new regime, companies that acquired intangible assets will actually report on these intangibles (87% of the companies). Companies that do not report on intangible assets under the new regime may not have acquired these assets.

[36] A t-test for the combined effect of new regulation (-2.09) and the interaction variable between these two variables (+0.186) shows that the null hypothesis that the sum is equal to zero can't be rejected (p-value = 0.563).

Therefore, in that time period, the separate reporting on intangibles has no effect on goodwill.

Also the combined effect of reporting on intangible assets on relative goodwill after the new regulation came into force is nihil.[37] An explanation may be that in the time period 1997-2000 due to less strict regulation not all acquiring companies report on acquired intangible assets, although they are present. In the meantime, these companies report on relatively high amounts of goodwill: purchased goodwill then contains these not reported intangible assets. Acquiring companies that do report on purchased intangibles assets separate from goodwill in 1997-2000, report lower goodwill amounts, by disentangling goodwill from these intangible assets. In the time-period 2002-2005, reporting on intangible assets other than goodwill is more unambiguous. This results in more regular goodwill values, which are less influenced by separate reporting on intangible assets. Under new regulation, goodwill is to a lesser degree a residual that includes other intangible assets. In contrast to the time period 1997-2000, in time period 2002-2005 not separately mentioning purchased intangible assets may indicate that they do not exist. Further, column (2) shows that for target firms within the service and technology industries the relative amount of purchased goodwill is significantly higher when compared to companies in other industries. If they belong to both service and technology industry, the joint positive effect is weakened.[38]

To control for the economic situation, and its effect on purchase prices and purchased goodwill, the S&P 500 index closing price on the announcement date of the acquisitions[39] is added as an indicator for the market trends. The regressions in column (3) and column (4) include the effect of the S&P 500 index on the relative amount of goodwill. From column (3), showing the results of the regression of relative goodwill on all explanatory variables excluding the interaction variables, it turns out that the significant effect of regulation on relative goodwill disappears. However, column (4) shows that, when including the

[37] A t-test for the combined effect of reporting on intangibles (-0.165) and the interaction variable between these two variables (+0.186) shows that the null hypothesis that the sum is equal to zero can't be rejected (p-value = 0.748).

[38] The combined effect of services (+0.190), technology (+0.113), and the interaction variable between these two variables(-0.0818) amounts to +0,221.

[39] In 14 out of 488 observations, the announcement date occurred in the weekend. For those cases, the S&P 500 index on the next trading day (closing price) was used.

interactions terms, the results are similar to the ones presented in column (2). The effect of the S&P 500 index on relative goodwill is almost significant at the 10% level. Accordingly, after controlling for the economic situation the results remain intact.[40]

In conclusion, when considering the combined effect of the characteristics on goodwill, 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", is partly supported by the analyses. For acquiring firms not reporting on acquired intangibles, goodwill paid as a percentage of the purchase price decreases on average with 18 percentpoints after new regulation came into force (column 4). The results of the analyses provide mixed evidence for hypothesis 4, stating that "reporting on separately acquired intangibles, as required by new regulation, reduces purchased goodwill". The negative effect of separate reporting on intangibles on purchased goodwill mainly occurs in the period before the new regulation. For firms reporting on intangibles in time period 1997-2000, relative goodwill was on average 17 percentpoints lower. When considering the effect of the introduction of the new accounting regime on relative goodwill amounts of acquiring companies already reporting on intangible assets, no significant change can be observed.

[Insert Table 5 here]

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

[40] A t-test for the combined effect of new regulation (-0.180) and the interaction variable between these two variables (+0.189) shows that nul hypothesis that the sum is equal to zero can't be rejected (p-value = 0.839). A t-test for the combined effect of reporting on intangibles (-0.171) and the interaction variable between these two variables (+0.189) shows that nul hypothesis for the sum to be equal to zero can't be rejected (p-value = 0.787).

lower. The outcomes of the regressions of the logarithm of goodwill are available from the author on request.

6 CONCLUSIONS

This study examines whether changes in the reporting on mergers and acquisitions in the US due to new regulation (the introduction of SFAS 141 “Business Combinations” (2001) and SFAS 142 “Goodwill and other Intangible Assets” (2001)) 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 transaction value should become less. In this study, acquisitions between the US stock exchange listed companies in a 4-years period after the introduction of the new rules (2002-2005) and in a 4-years previous period (1997-2000) were studied.

First, relative amounts of purchased goodwill before and after the introduction of the new rules were compared. Then, relative goodwill amounts were compared when classified into the presence of intangibles.

The results show, in line with our expectations, that in the period after the introduction of new regulation the average relative amount of purchased goodwill (59,8%) is lower when compared to the average amount of relative goodwill in the period before (67,7%). Even if a distinction is made for target industries by classifying them into services and into technology, these findings remain the same. Moreover, the outcomes for the time period 1997-2000, where relative goodwill of companies that do report on intangible assets is compared with relative goodwill of companies that do not, indicate that separate disclosure of intangible assets negatively affects the average relative amount of purchased goodwill. No support for this finding can be found for comparing relative goodwill amounts of companies that do and do not report on intangible assets for the time period 2002-2005. 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 amounts.

Next, multivariate regression analyses of the impact of the combined effect of the new regulation, the reporting of purchased intangible assets other than goodwill and, as control variables, industry classifications and the S&P 500 index on goodwill are performed. The results show a similar pattern. The new regulation negatively influences relative goodwill for firms that don't report on intangibles and positively influences relative goodwill for firms that do report on intangibles. Apparently, separate reporting on purchased intangible assets in time period 1997-2000 led to a more careful reporting on goodwill already: acquiring companies that do report on purchased intangible assets separate from goodwill in 1997-2000, report lower goodwill amounts, by disentangling goodwill from these intangible assets. For those companies the effect of the new regime on the relative amount of goodwill is limited.

In the time-period 2002-2005, reporting on intangible assets other than goodwill is more unambiguous. This results in more regular goodwill values, which are less influenced by separate reporting on intangible assets. Under new regulation, goodwill is to a lesser degree a residual that includes other intangible assets. In contrast to the time period 1997-2000, in time period 2002-2005 not separately mentioning purchased intangible assets may indicate that they are not there. Otherwise the more strict regulation would have required these companies to show these intangibles

The above-mentioned results indicate that the changes in regulation do influence on the reporting of purchased goodwill. Goodwill seems to have become a more concise concept. The results indicate that the new regulation may have 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?

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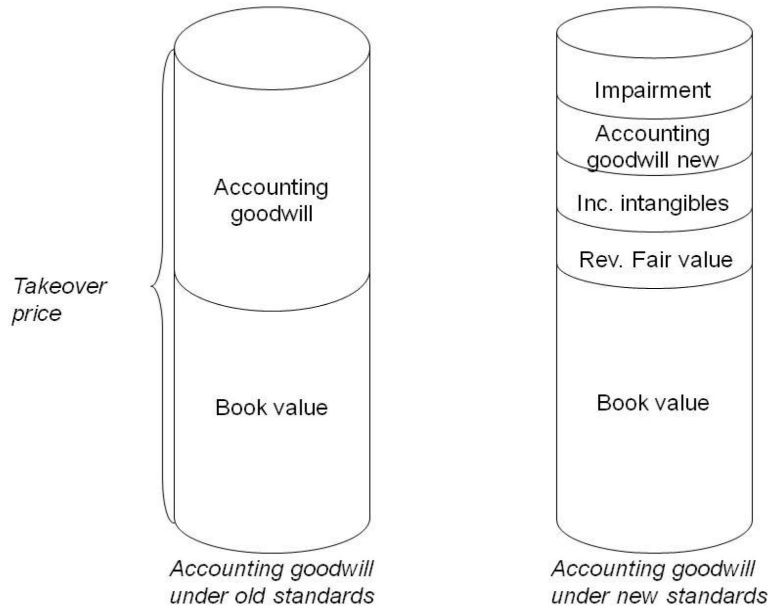
Figure 1:



Implications of new standards on the contents of reported goodwill.

Figure 2: Scatter diagrams of goodwill and relative goodwill amounts on value of transaction.

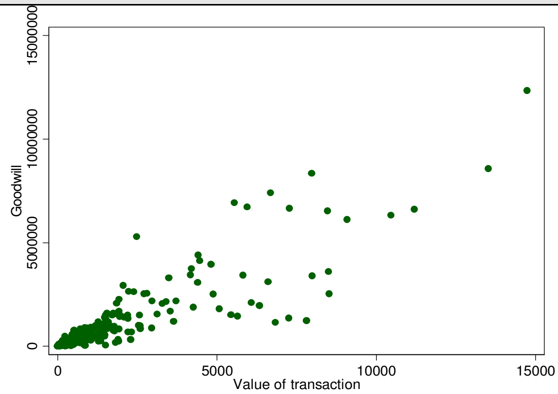
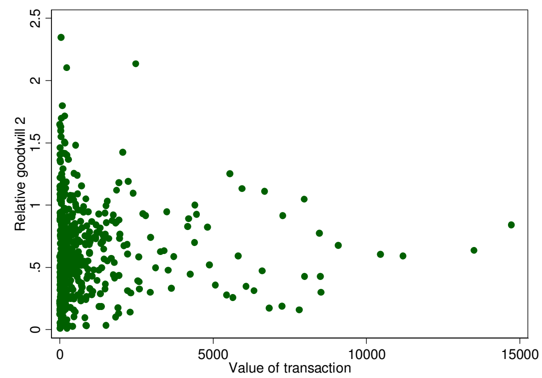
2.a goodwill and value of transaction	2.b relative goodwill and value of transaction
	

Figure 2 represents two 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 2.a shows a scatter diagram of goodwill with value of transaction. Figure 2.b is a scatter diagram of relative goodwill with value of transaction.
Source: Information on mergers and acquisitions and value of transaction is derived from SDC Platinum. Information on purchased goodwill is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).
Amounts are in $1,000.

Figure 3: Scatter diagrams of intangibles and relative intangibles amounts on value of transaction.

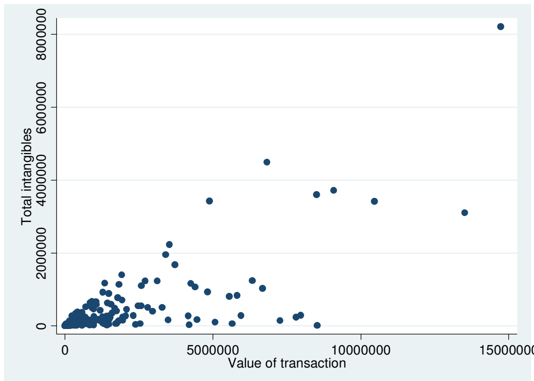
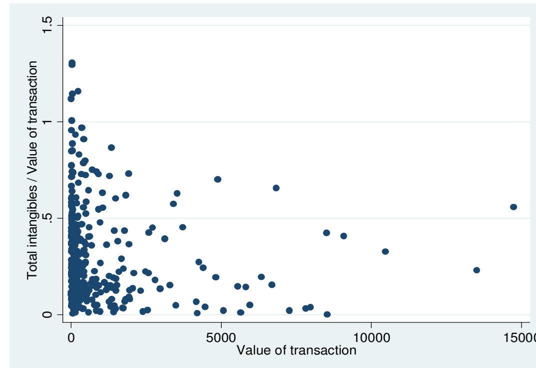
<table>
<tr><th>3.a intangibles and value of transaction</th><th>3.b intangibles/value of transaction and value of transaction</th></tr>
<tr><td>
</td><td>
</td></tr>
</table>

Figure 3 presents two 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 3.a and Figure 3.b 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 is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).

Amounts are in $1,000.

Table 1: Descriptives full sample.

Dependent variables:	**N**	**Freq.**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Goodwill*	488		602,821	1,312,062	57	12,343,000
Value of transaction*	488		960,730	1,869,600	2,278	14,732,640
Relative goodwill (divided by value of transaction)	488		0.634	0.362	0.007	2.346
Explanatory variables:						
Classification of industry target into	488					
• services		179				
• other		309				
Classification of industry target into	488					
• technology		223				
• other		265				
Acquirer reporting other acquired intangibles	488					
• yes		351				
• no		137				
S&P500 index	488		1155.95	180.94	754.72	1517.68

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, and value of transaction. The number of acquisitions providing information on the variables ranges between 35 and 488 per variable. Relative goodwill represents 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

Source: Information on mergers and acquisitions and value of transaction is derived from SDC Platinum Information on purchased goodwill, 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.*

Table 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**

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 (χ^2 =54.858, p-value=0.000).*

Table 3: Comparing relative goodwill in the different time periods by services and by technology: averages and t-test[A)]

	I time period 1997-2000	II time period 2002-2005	Difference average value I – II[b)] (Ha: diff > 0)
Relative goodwill	0.676 (0.027) *222*	0.598 (0.020) *266*	t=2.385*** ρ=0.009
By Services:			
(a) no services	0.613 (0.031) *155*	0.547 (0.027) *154*	t = 1.608* ρ = 0.055
(b) services	0.824 (0.049) *67*	0.669 (0.028) *112*	t = 2.949*** ρ = 0.002
Difference average value (a) – (b) **Ha: diff < 0**	t = -3.740*** ρ = 0.000	t = -3.063*** ρ = 0.001	
By Technology:			
(a) no technology	0.628 (0.034) *131*	0.565 (0.029) *134*	t = 1.397* ρ = 0.082
(b) technology	0.747 (0.042) *91*	0.632 (0.028) *132*	t = 2.393*** ρ = 0.009
Difference average value (a) – (b) **Ha: diff < 0**	t = -2.211** ρ = 0.014	t = -1.668** ρ = 0.048	

a) The table reports on relative goodwill amounts in the different time periods and industries, in parentheses the standard errors, and in italics the number of observations.
*b) The t-statistics and the p-values of the differences between the relative goodwill amounts are shown. 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 4: Comparing relative goodwill in the different time periods by reporting on intangible assets

	I Time period 1997-2000	II Time period 2002-2005	Difference average value I - II (Ha: diff > 0)
By intangibles			
(a) no reporting on intangible assets	0.734 (0.037) *103 (46%)*	0.520 (0.053) *34 (13%)*	t= 2.987*** ρ = 0.002
(b) reporting on intangible assets	0.626 (0.037) *118 (54%)*	0.610 (0.021) *232 (87%)*	t = 0.410 ρ = 0.411
Difference average value (a) – (b) **Ha: diff > 0**	t = 2.030** ρ = 0.022	t = 1.512* ρ = 0.066	

a) The table reports on relative goodwill amounts classified in the different time periods and in reporting on intangibles assets, in parentheses the standard errors, and in italics the number of observations.
*b) The t-statistics and the p-values of the differences between the relative goodwill amounts are shown. 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: Regressions of goodwill on explanatory variables

Variables	Relative goodwill Coefficient (t-value)			
	(1)	(2)	(3)	(4)
Dregulation	-0.0704**	-0.209***	-0.0399	-0.180**
	(2.04)	(3.03)	(1.01)	(2.53)
Dintangible assets	-0.0972**	-0.165***	-0.102**	-0.171***
	(2.38)	(3.36)	(2.51)	(3.48)
Dregulation*Dintangible assets		0.186**		0.189**
		(2.35)		(2.39)
Dservices	0.149***	0.190***	0.148***	0.188***
	(4.34)	(3.81)	(4.31)	(3.77)
Dtechnology	0.0820**	0.113***	0.0787**	0.109**
	(2.33)	(2.60)	(2.24)	(2.51)
Dservices* Dtechnology		-0.0818		-0.0801
		(1.20)		(1.18)
S&P 500			0.0002	0.0002
			(1.59)	(1.64)
Constant	0.650***	0.676***	0.453***	0.475***
	(20.12)	(18.56)	(3.55)	(3.72)
Number of observations	488	488	488	488
Adjusted R^2	0.064	0.073	0.075	0.090

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. The dependent variable relative goodwill is defined as goodwill divided by the transaction value of the acquisition. $D_{timeperiod}$ 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. $D_{technology}$ refers to a dummy variable set to one if the target company is in the technology industry. $D_{intangible\ assets}$ is a dummy variable set to one if the acquiring company reports on acquired intangible assets. $D_{services}$ $D_{rechnology}$ is an interaction variable set to one if target is in the services industry and in the technology industry. $D_{timeperiod}$ * $D_{intangible\ assets}$ 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 and intangible assets is derived from the 10-K forms of the acquiring companies that are available from Edgar database (SEC).