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Goodwill Impairment Testing according to IFRS in the United Kingdom

An empirical analysis of the discount rates used by the thirty largest FTSE 100 companies

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RESEARCH PAPER

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FTSE 100 companies

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Abstract:

This paper analyses the role and the methods of the determination of discount rates used for goodwill impairment testing according to IFRS. In addition to analysing the regulations laid out by the applicable IFRS, the paper displays the results of an empirical analysis of the discount rates used by the 30 largest FTSE 100 companies in the years 2008 to 2011. Additionally, the results are compared to those of a study with a similar focus conducted by Duff & Phelps in 2011.

The paper shows that it is adequate to use the value-in-use in determining the recoverable amount and that the grossing-up method for transferring the post-tax WACC into a pre-tax rate - which most of the companies use in practice - is not adequate. According to the empirical analysis, the average discount rates used have remained comparatively stable between 2008 and 2011. This suggests that the companies did not reflect any additional risks in the discount rate during the crisis. The study also shows that disclosures regarding impairment testing lack detailed information.

Zusammenfassung:

Diese Studie analysiert die Rolle und die Ermittlung der Diskontierungszinssätze im Rahmen des Wertminderungstests für Firmenwerte nach IFRS. Zusätzlich zu der Untersuchung der anwendbaren IFRS werden die Ergebnisse einer empirischen Analyse der von den 30 größten FTSE 100 Unternehmen verwendeten Diskontierungszinssätzen dargestellt. Diese Ergebnisse werden mit einer ähnlichen, 2011 von Duff & Phelps durchgeführten Studie verglichen.

Die Studie macht zum einen deutlich, dass der Nutzungswert die angemessenere Methode zur Ermittlung des erzielbaren Betrags ist und zum anderen, dass die von den Unternehmen meist angewandte Methode zur Umwandlung des WACC in eine Vorsteuer-Größe nicht angemessen ist. Die empirische Analyse zeigt, dass die verwendeten Diskontierungszinssätze zwischen 2008 und 2011 nur geringen Schwankungen unterlagen, was darauf hindeutet, dass die Unternehmen während der Finanzkrise keine zusätzlichen Risiken in ihren Diskontierungszinssätzen berücksichtigt haben. Festgestellt wurde außerdem, dass die von den meisten Unternehmen gemachten Anhangsangaben zu den Wertminderungstests für Firmenwerte nicht sehr detailgenau sind.

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1.   Introduction

In today's globalised business world, where transactions of whole businesses (or at least parts of them) take place almost every day, goodwill has become an important factor in the balance sheets of most big international companies. A recent spectacular example was Google purchasing Motorola Mobility for $12.5 billion.[1] According to a study done by the investment bank Houlihan Lokey, the STOXX Europe 600 constituents spent a total of €1.9 trillion on acquisitions between 2006 and 2010, equal to 26 per cent of their market capitalisation as of December 2010. In the same period, these companies recorded €187 billion in goodwill impairment. In 2010, 60 per cent of the annual goodwill impairment was recognised by three industries: telecommunications, energy and banks.[2] Goodwill and goodwill accounting have been a public focus during the recent global financial crisis following the bankruptcy of the American investment bank Lehman Brothers in 2008.

According to IAS 36.80 f, subsequent measurement of goodwill follows the impairment-only approach. This means that there is no regular depreciation of goodwill any longer. Instead, companies showing goodwill in their financial statements have to perform an annual impairment testing process, during which the carrying amount of goodwill has to be compared with the recoverable amount, which is defined as the higher of the fair value less costs to sell (FVLCS) and the value in use (VIU; IAS 36.18). Since the FVLCS of goodwill is a market-oriented value that can be found only in rare circumstances, companies usually have to rely on the VIU. The VIU is calculated with the help of discounted cash-flow methods. Consequently, the discount rate plays a significant role in the process of impairment testing.

In order to get a complete picture of the factors determining goodwill impairment testing and of the influence of the discount rates used, this paper will analyse the relevant IFRS, along with their practical application. The first part of this paper covers the theoretical issues of goodwill impairment testing. It analyses the regulations laid out by the applicable IFRS and deals mainly with the issues raised in professional discussions in recent years. For reasons of scope the main focus is the role and determination of the discount rates, however not without adhering to other important and critical issues of goodwill impairment testing like the determination of cash flows. It will be explained which factors influence the selection of the discount rates used, and in second step, what are their effects on impairment testing.

The second part of the paper presents the results of an empirical analysis of the discount rates used by the thirty largest FTSE 100 companies in the years 2008 to 2011. This index was chosen as data basis because it represents over 84 per cent of the market capitalisation of United Kingdom's listed companies.[3] The sample for the empirical analysis stems from weighing companies according to the official FTSE Index weighting factor as of June 2012. Additionally, the results are compared to those of a study with a similar focus conducted by the financial investment firm Duff & Phelps in 2011.[4] The

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[1] Thomson Reuters 2012.
[2] All facts: Hayn, Laas & Purcell 2011: 4 f.
[3] Fact sheet – FTSE 100 Index: 2.
[4] Palmer 2011: 4.

findings are used to analyse the discount rates applied. It is investigated whether any correlations or differences can be observed between selected clusters of industries. Additionally, the quality of information disclosed is analysed to ascertain which methods of determination of discount rates are applied in the United Kingdom.

2.   Theoretical aspects of the determination of the recoverable amount

2.1.   Impairment testing according to IAS 36

Goodwill is initially measured at the purchase consideration, adding any non-controlling interest in the acquiree and subtracting the net of the identifiable assets acquired and liabilities assumed measured at fair value (IFRS 3.32). However, it is an asset difficult to measure, implying a large potential of bias in accounting estimates. This problem is aggravated by the fact that goodwill itself does not generate any cash flow. It is therefore necessary to identify so-called cash-generating units (CGU) to which cash flows can be allocated. A CGU is defined 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" (IAS 36.6).

There are two stages in allocating goodwill to cash-generating units. First the identification of appropriate CGUs and second the allocation of the appropriate amount of goodwill to these CGUs (IAS 36.80). According to IAS 36.90, CGUs containing goodwill have to be tested for impairment annually. During the impairment test, the carrying amount of goodwill is compared with the recoverable amount (IAS 36.18). The following chapter displays the methods of determination of VIU and FVLCS, along with the impact of the discount rate on these values.

2.2.   Determination of value in use

The goodwill impairment test follows the rules of the test for single assets (IAS 36.19-57; IAS 36.74). The VIU has to be determined in two stages;

1. The calculation of the future expected cash flows to be derived from the CGU (IAS 36.31):
2. The determination of a discount rate that reflects the current market assessments of time value of money and the specific risk of the CGU (IAS 36.55).

The VIU is not entirely an entity-specific measure because of the way the discount rate is defined.[5] While the determination of the future expected cash flows is solely based on management's best estimates derived from recent financial budgets or forecasts, the determination of the discount rate

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[5] IAS.BC60.

should be market-oriented, and thus more objective.[6] There are two ways to recognise the expectations about the variations and the uncertainties during the calculation. It is possible to either adjust the expected cash flows, or to alter the discount rate. Furthermore, the calculation of the VIU has to be independent of effects of taxes and of the company's financing activities[7]. A pre-tax determination is applied (required by IAS 36.55) for reasons of avoiding double-counting of taxes.

2.2.1. Calculation of future expected cash flows

The IASB presents two approaches for the calculation of the VIU (IAS 36.A4 ff.):

1. The traditional approach
2. The expected cash flow approach.

The *traditional approach* takes into account the expected cash flows with the highest probability of incidence while the discount rate is adjusted by the inherent risks.[8] The advantage of this method is its' easy calculation. Nevertheless, it is not suitable for goodwill impairment testing. Instead it is applied for assets that are traded in a market, or generate contractual cash flows with a high certainty (IAS 36.A5/6).

The *expected cash flow method*, contrariwise, is used for more complex valuations (IAS 36.A7). It takes into account the different probabilities of expected cash flows and weighs the different alternatives with their specific possibility of incidence. The risk is recognised either as a premium to the discount rate or as a reduction of the expected cash flows (IAS 36.32). This method is in line with the methods used in the practice of business evaluation.[9]

According to IAS 36.33, future cash flows have to be predicted for two phases. During the first phase (over a maximum period of five years), cash flows are projected according to management forecasts based on most recent financial data.[10] In the second phase, a constant or declining growth rate is used that should not exceed the expected market-growth rate.[11] IAS 36.44 clarifies that the expected cash flows should be based on the CGU's current condition, and therefore it is not allowed to include effects from future restructuring or from capital-widening investments.[12] The problem is that management's budgets and forecasts often include investments or restructuring cost because it is the purpose of the entity to grow in value. Hence, these investments have to be eliminated in the process of determining the future expected cash flows.[13] This has induced criticism, because this "artificial"

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[6] IAS.BCZ54; IAS.BC60.
[7] Peemöller 2011: Chapter 10, Ref. 95.
[8] Peemöller 2011: Chapter 10, Ref. 101.
[9] Whole paragraph: Lienau & Zülch, KoR 2006: 322.
[10] Catty 2010: 209.
[11] Barden, Hall, Poole, Rigelsford & Spooner 2011: 506.
[12] Peemöller 2011: Chapter 10, Ref. 95.
[13] Gollnow & Himmel, IRZ 2011: 187.

result does not represent a realistic business plan.[14] Distinguishing between expansion investments and investments that are only made to keep the asset or CGU in its current condition is complicated or sometimes impossible.[15] There are some strongly opposed to the use of a growth rate in the long term prediction, as it is doubtful whether future growth is at all possible without capital-widening or restructuring investments.[16]

2.2.2. Calculation of the discount rate using WACC

The rate used to discount cash flows plays an important rolein determining the VIU.[17] The general regulations concerning the discount rate in IAS 36 are also applicable to CGUs (IAS 36.74). According to IAS 36.55, a pre-tax rate has to be used which should reflect the current market assessments concerning the time-value of money and the specific risks of the asset or CGU. Risks that were already included in the estimation of future cash flows shall not be considered again (IAS 36.55 (b)). The discount rate chosen must represent the return that investors would claim for an alternative investment. It has to be comparable to the generated cash flows in estimated amount, timing and risk profile (IAS 36.56). Since the VIU is a company-specific measure the discount rate is to be derived from the market, a mere adoption of market rates is not possible.[18] The IASB admits in IAS 36.BCZ55 that for many assets a current asset-specific market rate does not exist. Therefore IAS 36.A16 allows entities to use surrogates in order to estimate the discount rate. There are three options:

1. the entity`s weighted average cost of capital (WACC),

2. the entity's incremental borrowing-rate or

3. other market borrowing rates (IAS 36.A17).

Since the discount rate is an entity-specific measure, it has to reflect both cost of equity and debt.[19] It is suggested in the literature that neither the entity's incremental borrowing rate nor other market borrowing rates can be used as an appropriate discount rate. That is because the aforementioned rates only take into account the cost of debt, disregarding the fact that entities are always financed by both equity and debt. In addition, the standard does not specify whether a nominal borrowing rate or the incremental cost of debt is meant which would lead to different results while calculating the rate. The use of the WACC is therefore the only reasonable method for the determination of the discount rate.[20]

Special risks of the respective CGU like country-, currency- and price-risks need to be considered (IAS 36.A18). The entity's capital structure, and the way the entity financed the purchase of the asset or CGU, must not influence the discount rate because the expected cash flows arising from the asset do

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[14] Freiberg & Hoffmann 2012: §11, Ref. 131.
[15] Catty 2010: 209.
[16] Bollmann & Wabnitz, BewPr 2008: 15.
[17] Zwirner & Mugler, CFB 2011: 159.
[18] Freiberg & Hoffmann 2012: §11, Ref. 55.
[19] All: Kuhner & Hitz 2009: IAS 36, Ref. 78.
[20] All: Husmann, Schmidt & Seidel 2006: 9 f.

not depend on these factors (IAS 36.A19). As a general rule, only one single discount rate is used for the determination of the VIU. If this reacts sensibly to different specific risks over different future periods, multiple rates can then be used (IAS 36.A21). The discount rate has to be determined taking into consideration the economic lifetime of the asset or the CGU.[21]

There are several ways to determine the WACC.[22] One common formula is:

$$WACC = \frac{MV_e}{MV_d + MVe} * R_e + \frac{MV_d}{MV_d + MVe} * R_d * (1\text{-}t)$$

Mv_e = Market value of equity R_d = Cost of debt
MV_d = Market value of debt t = Corporate tax rate
R_e = Cost of equity

Figure 1: Weighted average cost of capital (in accordance with: Pawelzik & Dörschell 2012: Ref. 2094)

The WACC consists of the cost of equity and the cost of debt. The term "(1-t)" is used to take into account the tax benefits of financing the company via debt, as cost of debt is tax deductible.[23] The WACC is a post-tax figure but IAS 36 requires a pre-tax calculation.[24] Hence the WACC is to be determined as a post-tax figure and then transformed into a pre-tax figure.

2.2.2.1.   Calculation of the cost of equity

The cost of equity is a core element of the determination of the WACC.[25] It is the yield providers of equity claim for providing their capital.[26] As they take a bigger share in the company's operative risk than providers of debt, they claim a yield that takes into consideration not only the time-value of money but also a compensation for the risks they carry.[27] In contrast to providers of debt, they are not entitled to receive contractually fixed future cash flows. The CAPM is generally accepted as a method adequate for the determination of the cost of equity.[28] It initially represents the equity cost for an unlevered entity, which is an entity that neither has any financial debt nor any interest bearing assets.[29] In general, financial debt shall not be considered while testing an asset or a CGU for impairment. The exception to the rule would be a situation in which the recoverable amount of the CGU cannot be determined without its consideration.[30] If the recoverable amount is calculated considering financial debt (IAS 36.79), for instance if CGUs are equal to operating segments in order to meet the requirements of IAS 36.75, the financial debt has to be deducted from the respective

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[21] Freiberg & Hoffmann 2012: §11, Ref. 57.
[22] Pawelzik & Dörschell 2012: Ref. 2094.
[23] Deveraux, Mokkas, Pennock & Wharrad 2006: 15.
[24] Harr & Völkner 2011: IAS36, Ref. 49.
[25] Pawelzik & Dörschell 2012: Ref. 2086.
[26] Pawelzik & Dörschell 2012: Ref. 2086.
[27] Freiberg & Hoffmann 2012: §11, Ref. 61.
[28] All: Freiberg & Hoffmann 2012: §11, Ref. 61.
[29] Pawelzik & Dörschell 2012: Ref. 2087.
[30] IAS 36.76 (b).

carrying amount.[31] Operational debt such as money owed to vendors has to be considered, since it is part of the net current assets.[32] If financial debt is considered, the unlevered cost of equity (determined by using the CAPM) has to be converted to take into account the actual debt ratio of the entity.[33]

According to the CAPM the (unlevered) cost of equity is calculated as follows:

$$\text{unlevered cost of equity} \; = \; r_F \; + \; \text{market risk premium} \; * \; \beta$$

Figure 2: Calculation of the cost of equity using the CAPM
(following the theory of Sharpe, JoF 1964: 425 ff.)

The unlevered cost of equity according to the CAPM is derived from three factors: The risk-free rate (rF), the market risk premium and the entity-specific beta-factor (β).

The *risk-free rate* represents the required rate of return for the provision of a specific amount of money, like equity without a previously agreed contract period. It does not take into account any risks related to currency, default or change in interest rate. It is generally represented by the yield paid for government bonds (in the respective country), with a contract period comparable to the useful life (or planning phase in case of goodwill) of the asset which is commonly seen as risk-free.[34] In stable countries (like the United Kingdom) the determination of the risk-free rate does not usually pose a problem.[35] However, the financial crisis has shown that not all government bonds (taking Greece for example) are risk-free and that high yields have to be paid, for example by Spain, for the issuance of government bonds (the yield for 10-year Spanish government bonds surpassed 7.5 per cent in July 2012).[36] In these countries, the determination is more difficult.

The *market risk premium* is the difference between the risk-free rate and the market rate to be paid for risky investments.[37] It is a market-wide value and therefore neither entity- nor CGU-specific.[38] Results from surveys by Damodaran suggest that the main influencing factors of the market risk premium are risk aversion, economic risk, information, liquidity, catastrophic risk, along with irrational or behavioural components.[39] There are three possible approaches for the estimation of the market risk premium which are based on surveys of relevant investors, the analysis of historical data or an estimate of future market risk premiums on the basis of present market rates.[40] A study reports that in 2011 the average market risk premium rate used by companies in the United Kingdom was at 4.9 per cent[41]

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[31] Pellens, Fülbier, Gassen & Sellhorn 2011: 768.
[32] Pawelzik & Dörschell 2012: Ref. 2087.
[33] Pawelzik & Dörschell 2012: Ref. 2094.
[34] Freiberg & Hoffmann 2012: §11, Ref. 58.
[35] Damodaran 2011: 5.
[36] Trading Economics 2012.
[37] Freiberg & Hoffmann 2012: §11, Ref. 61.
[38] Damodaran 2011: 5.
[39] Damodaran 2011: 6 f.
[40] Damodaran 2011: 15.
[41] Fernandez, Aguirreamalloa & Corres 2011: 6.

Most companies declared to use Ibbotson International Risk Premium Reports, research by Damodaran[42], information from analysts and investment banks and other economic news agencies or internal estimates for the determination of their market risk premiums.[43]

While the risk-free rate and the market risk premium are criteria that are independent of the considered company, the *beta* represents the company-specific systematic risk in comparison to the general market average. A beta of 1.0 implies that the company's specific risk equals the market average risk, while a beta below 1.0 suggests that the specific risk is lower than the market average and vice versa. The beta value can be derived either from the individual condition of the entity, or be determined by analysing a peer-group of listed companies that are comparable to the entity in question.[44] Data retrieved from ShareScope[45] suggests that the average beta value of all FTSE 100 companies in 2011 was 0.98. This means that the average risk for an FTSE 100 company almost equals the average market risk. While with 2.59 the Eurasian Natural Resources Corporation plc had the highest beta value in the FTSE 100 index, Tate & Lyle plc had the lowest with only 0.41.[46]

2.2.2.2. Calculation of the cost of debt

The cost of debt of an entity is subject to its credit rating. The entity's incremental borrowing rate is usually not directly determinable. There are three possibilities to determine the cost of debt. It can be derived either from the actual rate of return of the entity's issued bonds, from the actual rate of return from other companies with the same credit rating, or from the company's average credit interest rate. Nonetheless, the results of all these methods are entity-specific and therefore have to be adjusted to the specific risks of the respective CGU.[47]

2.2.2.3. Calculation of equity and debt ratios

In the WACC-model, the equity and debt ratios are used as weighting coefficients. The calculation uses the market value of equity and debt instead of their carrying amounts. In order to simplify the calculation, it is allowed to use the carrying amount if the interest levels have not changed significantly since the debt was first recorded.[48]

Due to a circulation problem, the determination of the value of equity poses a bigger problem. The desired target value equals the value needed to calculate itself. One possible but complicated solution is to use an iterative method. Hence, a solution is to use the market capitalisation of the CGU or the

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[42] Professor of Finance at the New York University Stern School of Business.
[43] Fernandez, Aguirreamalloa & Corres 2011: 6.
[44] All: Pawelzik & Dörschell 2012: Ref. 2086.
[45] ShareScope is a financial data analysis software.
[46] ShareScope data from 2011.
[47] Harr & Völkner 2011: IAS 36, Ref. 53
[48]: Harr & Völkner 2011: IAS 36, Ref. 49.

average capital structure of other comparable listed companies.[49] However, it is questionable if the average capital structure of comparable companies (if there are any) can be used as an alternative. Therefore, the capital structure should be determined in an entity-specific way.[50]

2.2.3.   Implications of the pre-tax determination

The calculation of the VIU requires pre-tax figures. This is a problem because yield returns observed on markets are usually post-tax rates[51] and WACC is calculated as a post-tax measure. Therefore it refers to post-tax cash flows.[52] In practice, the discount rate is determined as a post-tax factor and then used to calculate a post-tax VIU which is subsequently adjusted to the pre-tax rate, a method allowed by IAS 36.A20.[53] This practice has negative effects on the comparability of calculations, since IAS 36.A20 does not specify how the adjustment has to be made. Alternative approaches are the iterative or the grossing-up methods. Practitioners usually use the "grossing-up" method. According to this method, the post-tax rate determined with the help of WACC is divided by a simplified tax-rate. The application of this method is limited since the real tax load can differ substantially from the simplified one due to non-deductible expenses or accumulated tax deficits.[54] Duff & Phelps discovered a significant difference of 0.7 between the results of both methods. Therefore the iterative method is preferred for adjusting the discount rate.[55]

2.3.   Determination of fair value less cost to sell

Alternatively, the recoverable amount can be calculated as FVLCS, which is a market-oriented value. The determination of the FVLCS requires a binding sales agreement or a market price for the respective asset (IAS 36.25 f.). The problem is that for a CGU containing goodwill these values can rarely be obtained. In these cases, it is possible to use a DCF-method to determine the FVLCS (IAS 36.20).[56] Since the FVLCS is a selling price the selected DCF-method has to be different from the value in use calculations. All estimations and assumptions have to be derived from market-oriented data, and thus must include a market perspective.[57] The corporate strategic plan has to be adapted to meet the expectations of a fictional third party buyer. Furthermore, a review of the assumptions used is necessary to prove that they are plausible from the perspective of the third party buyer.[58] Critics point out that the usage of a DCF-method to determine the FVLCS does not seem appropriate. It is questionable whether management is able to forebode the cash flows expected by the market

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[49] All: Harr & Völkner 2011: IAS 36, Ref. 49.
[50] Dörschell, Franken & Schulte 2009: 287.
[51] Freiberg & Hoffmann 2012; § 11, Ref. 68.
[52] Zwirner & Mugler, CFB 2011: 159.
[53] All: Bollmann & Wabnitz, BewPr 2008: 15.
[54] All: Zwirner & Mugler, CFB 2011: 159.
[55] All; Palmer 2011: 2 ff.
[56] All: Zülch & Siggelkow, IRZ 2010: 31 f.
[57] Harr & Völkner, 2011: IAS 36, Ref. 31.
[58] Bollmann & Wabnitz, BewPr 2008: 14.

participants.[59] As a consequence of this knowledge gap, market participants might assess the outlook of the company to be worse than actually justified. This would force management to use worse than actual market expectations against better knowledge.[60] In addition, the comparatively stringent instructions for the calculation of the VIU (IAS 36.30-57) could be bypassed by calculating the FVLCS with a DCF-approach.[61] As a conclusion, the VIU should be used if the FVLCS is not determinable based on binding sales agreements or market price estimates.

3.   Empirical analysis of the discount rates used by the thirty largest FTSE 100 companies in the United Kingdom

3.1.   Method and sample selection

3.1.1.   Methods applied and reliability of data

The main purpose of this empirical investigation is to analyse the discount rates used by major companies in the United Kingdom. Furthermore, the methods used for the determination of the discount rate and the quality of the disclosed information will be scrutinized. For this purpose the discount rates are examined during the period from 2008 to 2011 for both the whole population, along with selected industry sectors. The methods of determining the discount rate and the quality of the disclosed information are investigated for the year 2011.

The empirical basis for our research is formed by the annual reports of the thirty largest FTSE 100 companies. These companies were chosen because of their size, their leading role in different industries and their comparatively elaborated disclosures about goodwill impairment in the notes. The data sample was selected from the FTSE 100 constituents as of 30 June 2012. First, a list of all FTSE 100 constituents as of 30 June 2012 was retrieved from the FTSE UK Monthly Review of June 2012. The thirty largest constituents were then selected by weighing the constituents with the help of the FTSE index weight factors drawn from the official FTSE 100 Constituents Report.[62]. Since Royal Dutch Shell plc has two listings[63] in the index, the thirty-first largest company was included in the sample instead, in order to obtain the correct sample size. The companies were then categorized according to industry sectors. After selecting the sample, the annual reports of the relevant companies for the years from 2008 to 2011 were examined for the disclosed information about the discount rates used for goodwill impairment testing. Disclosure of the companies varied: While some companies had disclosed discount rates for each individual CGU, others had given only ranges of discount rates used, or had disclosed only a single discount rate that had been used for all CGUs. If companies had disclosed more than one discount rate, the arithmetic average of all disclosed rates was calculated

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[59] Zülch & Siggelkow, IRZ 2010: 32.
[60] Freiberg & Hoffmann 2012: §11, Ref. 32.
[61] Freiberg & Hoffmann 2012: §11, Ref. 137.
[62] FTSE All-Share Index Series – UK Monthly Review June 2012: 3-7 f.
[63] A- and B-shares are separately listed on places four and seven respectively.

and applied in the empirical analysis as the best way to represent the whole range of interest rates used by one company. The minimum, maximum, median, arithmetic average values and their standard deviation were calculated separately for the complete sample and for every industry sector.

Companies which had only disclosed post-tax values or had not specified whether their rates represented pre- or post-tax values were excluded from the sample. In contrast to a similar study performed for the DAX companies in 2010[64], the post-tax discount rates were not simply grossed up to be used in the sample because of the theoretical concerns described. It is assumed that the sample of the thirty largest FTSE 100 companies represents a valid comparison group. On these grounds conclusions can be extrapolated for the whole population of the FTSE 100 constituents. This was confirmed by the results. The data drawn from the empirical analysis show the same general trend as a study performed by the financial advisory firm Duff & Phelps which considered all FTSE 100 constituents in 2011.[65]

3.1.2. Selection of the sample

The following chapter discloses information about the composition of the sample group and the constituents included in the sample.

Industry	Share in total population
Consumer Products	35 %
Oil & Gas	10 %
Financials	20 %
Utilities	15 %
Other	20 %
Total	**100 %**

Table 1: Sample industry allocation in 2011

Table 1 shows the allocation of the industry sectors within the sample in 2011. The companies were allocated to five different industry sectors: Consumer products, oil & gas, financials, utilities and other. Companies that did not fit into the first four sectors were allocated to the "other" group. The allocation to industry sectors was performed by using information given in the companies' annual reports.
Due to differing disclosure policies of the companies, sample sizes vary for every year.

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[64] Zwirner & Mugler, CFB 2011: 160 f.
[65] Palmer 2011: 4.

Sample size by industry sector	2008	2009	2010	2011
Consumer products	7	8	8	7
Oil & Gas	3	3	3	2
Financials	4	4	4	4
Utilities	3	3	3	3
Other	6	6	5	4
Total sample	**23**	**24**	**23**	**20**

Table 2: Sample sizes by industry sector

3.1.3.   Results of the empirical analysis

The following chapter presents the results of the empirical analysis. After considering the information concerning the discount rates disclosed by the constituents of the sample, the general development of the rates from 2008 to 2011 is discussed and the results from the different industry sectors are examined more closely.

3.1.3.1.   Quality of disclosed information

Method of discount rate disclosure	Percentage
Pre-tax	57 %
Post-tax	16 %
Both	10 %
Not disclosed	17 %
Total	**100 %**

Table 3: Companies disclosing pre- and post-tax discount rates in 2011

In the sample, 67 per cent of the companies disclosed pre-tax or pre- and post-tax rates in 2011. 16 per cent of the companies included only post-tax rates and 17 per cent did not show any discount rates at all or did not specify whether their discount rates were pre- or post-tax values. The three companies which did not reveal any discount rates were Anglo American plc, Tullow Oil plc, and BHP Billiton plc. BHP Billiton plc was the only company that, although including goodwill in its balance sheet, did not mention any discount rate. Two companies (HSBC Holdings plc and Glencore International plc) were excluded from the sample for not disclosing whether their discount rates represented pre- or post-tax values. Some companies that showed pre-tax rates in 2011 did not disclose any in previous years or vice versa. For example, BG Group plc and GlaxoSmithKline plc

gave a post-tax rate in 2011 but pre-tax rates from 2008 to 2010. Rio Tinto plc disclosed both pre- and post-tax rates in 2008 and 2009 but only post-tax rates in 2010 and 2011. Two companies - Xstrata plc and Lloyds Banking Group plc - revealed pre-tax rates for some CGUs and post-tax rates for other CGUs. In these cases, only those CGUs for which pre-tax rates had been published were included in the calculation.

Disclosed method of discount rate determination	Percentage
WACC	56 %
CAPM	7 %
Other	10 %
Not disclosed	27 %
Total	**100 %**

Table 4: Method of discount rate determination as disclosed in 2011

The majority of the companies in the sample applied the WACC method of discount rate determination. Two companies used the CAPM, while 27 per cent of the companies did not disclose any related information. "Other" methods were mentioned by companies in the financial industry. These were current market rates (Standard Chartered plc), average discount rates for comparable UK listed assets (Prudential plc) or internal measures and available industry information (Lloyds Banking Group plc).

Eleven companies published only a single CGU or a single discount rate for more than one CGU in 2011. Sixteen companies revealed discount rates for more than one CGU in the same year. The highest number of discount rates was published by Standard Chartered plc, which showed discount rates for twelve CGUs in 2011.

3.1.3.2. Development of discount rates in the sample between 2008 and 2011

To obtain a general overview of the development of the rates disclosed by the companies, the following chapter contains the results of the empirical analysis for the sample as a whole.

	2008	**2009**	**2010**	**2011**
Maximum	6.00 %	6.00 %	6.00 %	6.00 %
Minimum	19.64 %	19.16 %	19.39 %	18.30 %
Median	10.85 %	11.00 %	10.58 %	10.90 %
Arithmetic average	11.49 %	11.48 %	11.31 %	11.81 %
Standard deviation	2.96 %	2.93 %	2.92 %	3.56 %

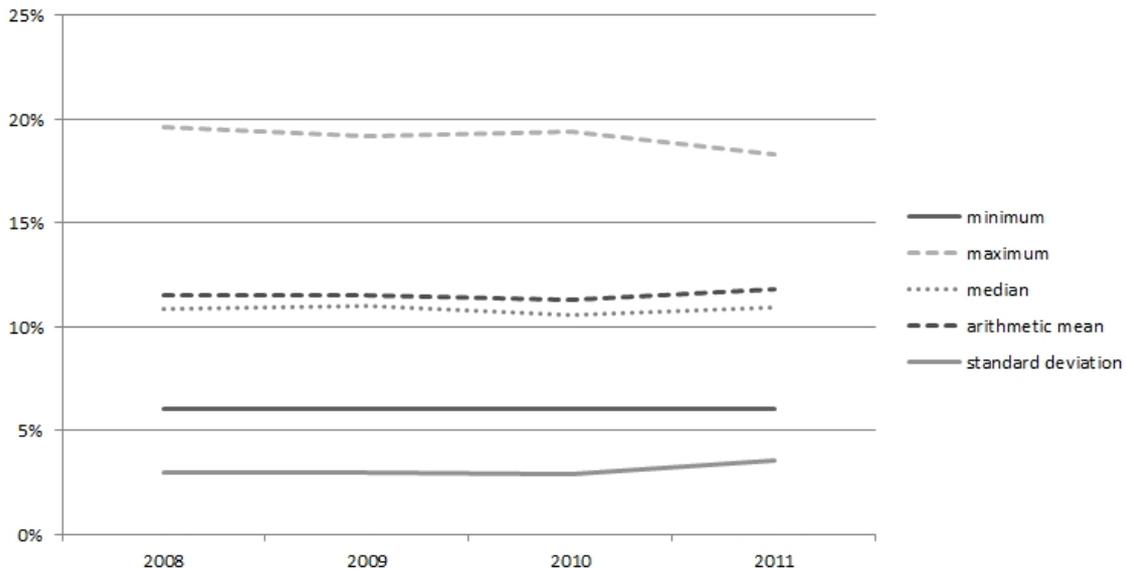Table 5: Pre-tax discount rates disclosed between 2008 and 2011

Figure 3: Development of pre-tax discount rates disclosed between 2008 and 2011

The median and arithmetic average values of the pre-tax discount rates disclosed remained comparatively stable throughout the previous four years, only fluctuating in the range of about 0.5 percentage points. This suggests that the companies did not account for any additional risks in the discount rates during the crisis years. The data show a small decline in the pre-tax rates in 2010. However, these increased again in 2011. This could be related to the beginning of the European sovereign debt crisis, which led to recessions especially in southern European countries where some of the tested CGUs are located. However, the low standard deviation of the pre-tax discount rates suggests that the margin of the average rates is too small to draw a general conclusion. The rising standard deviation in 2011 is mainly due to the consumer products and oil & gas industries which showed a significantly higher standard deviation.

Considering the maximum discount rates, there has been a declining trend since 2008. From 2008 to 2010, Standard Chartered plc used the highest pre-tax discount rates, most likely due to the countries where their CGUs containing goodwill are located (especially Asia, Pakistan, Korea, Taiwan, India and Indonesia). They also disclosed the highest pre-tax discount rate in the sample for their Pakistan CGU in 2009 (28.4 per cent). In 2011, the highest average discount rate was published by Diageo plc. It was mainly influenced by the high rates calculated for their Southern European, Russian, Eastern

European, and African businesses. By far the smallest discount rate was issued by Royal Dutch Shell plc, with 6 per cent in every year from 2008 to 2011.

3.1.3.3.   Comparison of the pre-tax discount rates disclosed

After examining the development of the disclosed pre-tax discount rates of the sample in general, the question remains whether there are noticeable differences between the different industry sectors.

Consumer Products	2008	2009	2010	2011
minimum	9.70%	10.00%	9.18%	7.40%
maximum	16.00%	15.25%	14.38%	18.30%
median	11.00%	10.84%	10.26%	10.00%
arithmetic average	11.65%	11.29%	10.76%	11.10%
standard deviation	2.25%	1.79%	1.58%	3.40%

Financials	2008	2009	2010	2011
minimum	13.50%	13.67%	13.50%	14.33%
maximum	19.64%	19.16%	19.39%	18.06%
median	15.18%	15.69%	15.00%	16.38%
arithmetic average	15.88%	16.05%	15.72%	16.29%
standard deviation	2.72%	2.30%	2.67%	1.89%

Oil & Gas	2008	2009	2010	2011
minimum	6.00%	6.00%	6.00%	6.00%
maximum	11.00%	11.00%	13.00%	13.00%
median	8.00%	8.00%	8.00%	9.50%
arithmetic average	8.33%	8.33%	9.00%	9.50%
standard deviation	2.52%	2.52%	3.61%	4.95%

Utilities	2008	2009	2010	2011
minimum	9.67%	7.54%	7.90%	8.10%
maximum	10.67%	11.18%	10.58%	10.00%
median	9.70%	10.00%	10.00%	8.38%
arithmetic average	10.01%	9.57%	9.49%	8.83%
standard deviation	0.57%	1.85%	1.41%	1.03%

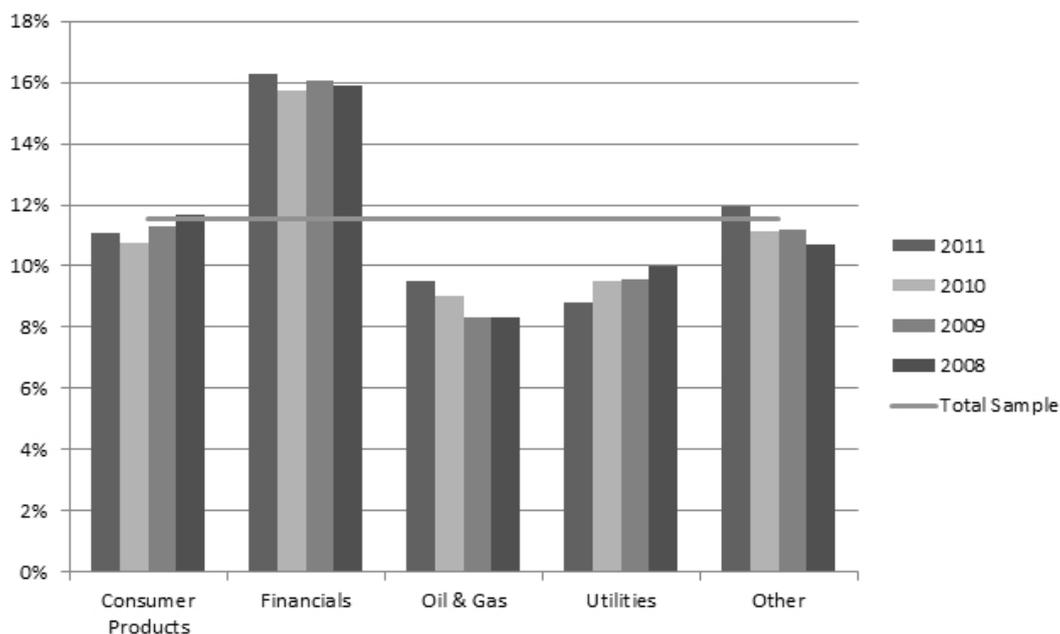| Other	2008	2009	2010	2011
minimum	8.50%	9.50%	9.06%	9.69%
maximum	12.75%	13.83%	13.00%	14.38%
median	10.78%	10.61%	10.80%	11.90%
arithmetic average	10.71%	11.22%	11.12%	11.97%
standard deviation	1.42%	1.72%	1.71%	2.11%

Figure 4: Pre-tax discount rate averages by industry between 2008 and 2011

Figure 4 shows the development of the average rates of industry sectors compared to the average rate of the complete sample (over all years researched 11.52 per cent). The data suggest that there are comparatively huge differences in pre-tax rates disclosed between different industry sectors. While consumer products and other sectors (comprising telecommunication, industrials and basic materials) have been near the average every year, the financial industry has used considerably higher rates of 15.98 per cent (total average) over all the years. However, the oil & gas and utilities industries applied lower total average rates of 8.79 per cent (oil & gas) and 9.48 per cent (utilities). The higher pre-tax rates mentioned by the financial industry (mostly comprised of banks) can be explained by the methods used to determine the discount rates: According to research by the investment firm Duff & Phelps, most banks use the cost of equity to determine their discount rates. This stands in contrast to WACC which is used in most other industry sectors.[66] The oil & gas sector showed comparatively low discount rates. This is astonishing since research findings, including all FTSE 100 constituents, suggest that the oil & gas sector normally uses higher interest rates.[67] One reason for this could be that only three sets of data were available, including the exceptionally low rate disclosed by Royal Dutch Shell plc. The comparatively low interest rates and standard deviations disclosed by the utilities sector can be explained by lower risks and more stable cash flows generally linked to this sector. These findings are also in line with the study by Duff & Phelps.[68]
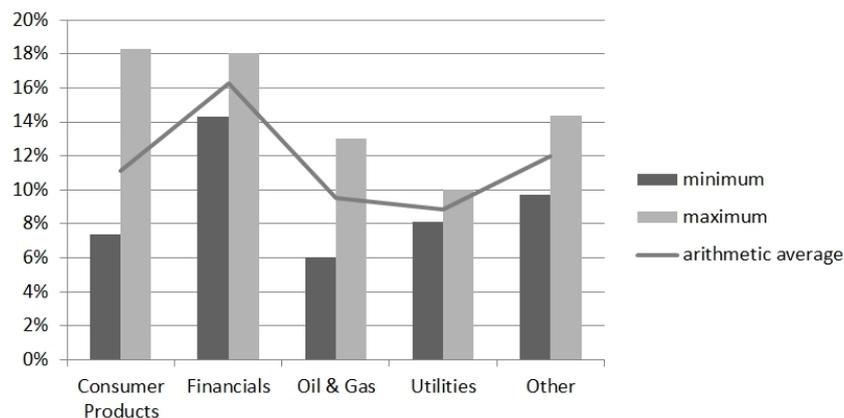

Figure 5: Minimum and maximum of pre-tax discount rates by industry in 2011

Figure 5 compares the minimum and maximum discount rates disclosed, organised by industry sectors in comparison to the respective industry sector average. In 2011, Diageo plc (in the consumer products sector) showed the highest discount rate. However, this was just an exception in this sector, since the average rate was significantly lower. The information was most limited in the basic materials sector, where two of the five constituents had not disclosed any discount rates, and none of the constituents had disclosed pre-tax rates for every year. Hence no conclusions can be drawn for this sector. The Duff & Phelps study also revealed that the available information in this sector was very

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[66] Palmer 2011: 4.
[67] Palmer 2011: 4.
[68] Palmer 2011: 4.

limited, but found the disclosed rates to be generally lower than in other sectors.[69] This could be due to the fact that companies in this sector often disclose discount rates in real terms, excluding inflation.[70]
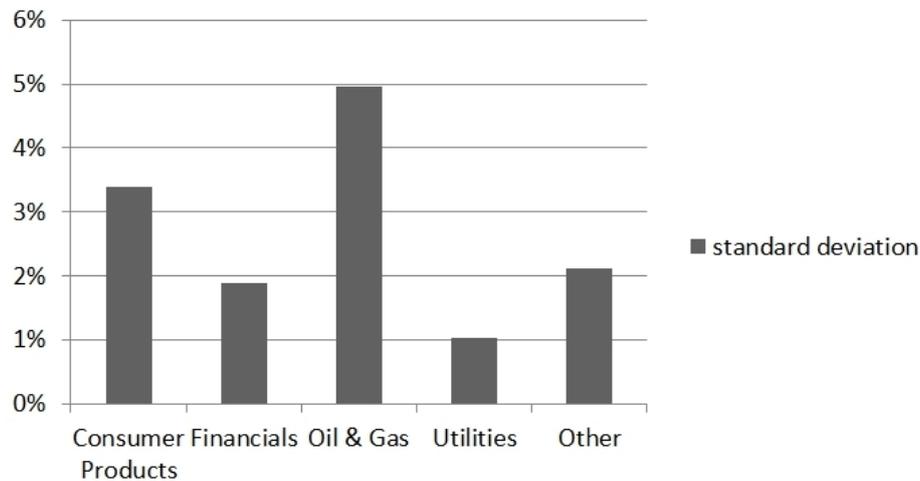

Figure 6: Standard deviation of pre-tax discount rates disclosed by industry in 2011

The consumer products and oil & gas sectors are mainly responsible for the increased standard deviation in 2011. The lowest standard deviation in pre-tax rates was observed in the utilities sector, with an average of just over one per cent (1.03 per cent). As explained above, the oil & gas sector deviation is an outlier caused by limited data available in 2011 along with the low rates of Royal Dutch Shell plc.

4.   Conclusion

The purpose of this paper is to critically analyse the theory of goodwill impairment testing and the influence of discount rates used during the process. This forms the basis for the examination of the process of goodwill impairment testing and the discount rates used in practice in the United Kingdom. As for the theoretical background concerning goodwill impairment testing (IAS 36), it was shown that it is adequate to use the VIU in determining the recoverable amount. The FVLCS for the relevant CGU can almost never be determined by market prices, and the allowed alternative to use discounted cash flow methods for the determination of the FVLCS seems questionable.

The discount rate plays an important part in goodwill impairment testing. In practice, most companies use the WACC to determine the appropriate discount rate. Using this method, there are entity-specific and non-specific factors influencing the discount rate. While non-specific factors like the risk-free rate and the market risk premium can influence every company in the same way, the entity-specific factors

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[69] Palmer 2011: 4.
[70] Palmer 2011: 4.

affect every company differently. Companies from the same industry sector show similar characteristics and operate in (mainly) the same environment, which makes it possible to determine differences between separate industry sectors. There has also been some criticism about the discount rate determination process. Since most of the factors used to calculate the WACC are only determined as post-tax values, the post-tax WACC has to be transferred into a pre-tax rate. IAS 36.A20 does not state any specific methods to be used for the calculations which has negative effects on the comparison of financial statements. Most companies use a grossing-up method, which is not adequate. Instead an iterative method should be used. It is further criticised that while being allowed by IAS 36.A17, methods to determine the discount rate other than WACC are not appropriate.

The empirical analysis showed that the average discount rates used by the companies in the sample have remained comparatively stable between 2008 and 2011. This result suggests that the companies did not reflect any additional risks in the discount rate during the crisis. However, there was a declining trend in average rates in 2010 and again a small increase in 2011 shown, which suggests easing influences of the financial crisis in 2010 and the beginning of the European sovereign debt crisis in 2010/2011. Nevertheless, these trends could also be due to some outliers or one of an abundance of factors influencing the discount rate in different ways which make it impossible to draw general conclusions. Whether the financial crisis had any effects on goodwill impairments in general cannot be determined from the discount rates because companies can reflect additional risks in the cash flows.

The empirical analysis shows that the pre-tax discount rates used differed significantly between industry sectors. While the financial industry applied the highest rates, the lowest rates were found in the utilities industry. The differences can be explained by different methods of determining the discount rates and different risks associated with the respective industries.

Another finding is that disclosures regarding impairment testing lack detailed information; some companies did not disclose any discount rates at all or only one rate for multiple CGUs. As a general conclusion it can be noted that the current rule set leaves a significant potential for bias in the required accounting estimates.

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List of abbreviations

BB	Betriebs-Berater
BC	Basis for conclusions
BewPr	BewertungsPraktiker
CAPM	Capital asset pricing model
CFB	CORPORATE FINANCE biz
CGU	Cash-generating unit
DAX	Deutscher Aktienindex
DCF	Discounted cash flow
FTSE	Financial Times Stock Exchange
FVLCS	Fair value less costs to sell
FY	Financial year
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IRZ	Zeitschrift für Internationale Rechnungslegung
JoF	Journal of Finance
KoR	Zeitschrift für internationale und kapitalmarktorientierte Rechnungslegung
PLC	Public limited company
VIU	Value in use
WAAC	Weighted average cost of capital

List of figures and tables

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