

Did the financial crisis have an impact on Goodwill?

An analysis of the Telecommunications industry

Master thesis realized by
Vincent Libot

Supervisor
Yvan Stempniewsky

Reader
Bénédicte Vessié

Academic year 2014-2015
Master in Management Science/Business Engineering

Abstract

Over time, accountancy moved forward, bringing more reality and more reliability to financial information, with the purpose of making it understandable and trustable for everyone. Nevertheless, it is not always an easy task: sometimes, variables necessary in the valuation of an asset are simply missing. Indeed, an asset is valued through its ability to generate future incomes over a definite time. In the case of goodwill there is no contractual terms, neither in money nor in time. Therefore its valuation is left to computation by the mean of cash flow forecast plus an estimation of perpetuity growth of the asset. The assumptions needed in the valuation of that kind of asset with an indefinite useful time are subject to economical environment changes. Through the analysis of the goodwill in the telecommunications industry, this thesis tends to determine whether or not the subprime crisis had an impact on its valuation. The results have revealed, on the one hand, that the crisis certainly had an impact. In time of recession the macro-economic variables such as the cash flow forecast, based on past experience, and therefore on pre-crisis background, do not stick to the reality of turmoil times. Moreover, the future in such a context goes hand-in-hand with the fear of recession, making the expectations of the market participants volatile, hence impacting the cost of capital used as discount factor. Concerning the growth expectations, companies used low ones, which is consistent with a time of crisis, the future being unpredictable. On the other hand, even if the financial crisis played an active role, it is certain that in the game of valuation, the players have adapted themselves by using discretion on computation and in disclosures, with the purpose of avoiding or reducing as much as possible the real impact of the crisis on goodwill.

First and foremost I wish to express my gratitude to my parents who, despite hard times, never stopped to believe and to invest in one of their most valuable and expensive asset. I did everything I could to make that investment worth it.

The present paper brings an end to all the moments of effort and pleasure. Therefore I would like to thank the persons that helped me to achieve it.

My professor Yvan Stempniewsky, who guided me and advised me wisely.

Marion, without whom the form of this thesis would not have been what it is.

My friends and roommates who, directly or indirectly, have shown their encouragement and have alleviated from time to time this ubiquitous pressure.

Table of content

Abstract	i
List of figures	v
List of abbreviations	vi
Introduction.....	1
PART I. Theoretical Goodwill.....	5
I. Background.....	6
II. At the inception of goodwill - The business combination.....	8
A. Identifying the acquirer and the acquiree.	8
B. Identifying the acquisition date.	8
C. Recognising and measuring the identifiable assets acquired, the liabilities assumed and any non-controlling interest in the acquiree.....	9
D. Recognising and measuring goodwill or a gain from a bargain purchase.	9
III. Goodwill.....	11
A. Cash generating units (CGU)	11
B. Timing of impairment test for goodwill	12
C. Impairment test.....	12
1. Fair value less cost of disposals	13
2. Value in use	15
D. Non reversibility and management incentives	21
IV. Financial crisis	22
PART II. Goodwill in the Telecommunications industry	24
I. Goodwill.....	25
A. Goodwill position of the telecom industry	25
1. Total goodwill position of the sample	25
2. Goodwill ratios	27
B. Goodwill impairment charges	29

C. Testing goodwill for impairment	33
1. Cash generating unit allocation	33
2. Planning periods	35
3. Determining the recoverable amount.....	36
4. The rates.....	37
5. Sensitivity analysis.....	45
II. Does the impairment of goodwill better reflect its economic useful life?	47
A. Intuitions resulting from the analysis of the impairment method	47
B. What else?.....	48
Conclusion	50
Bibliography.....	54
Appendices	62
Appendix 1 - Goodwill position	63
Appendix 2 - Goodwill variation	64
Appendix 3 - Goodwill over total assets.....	65
Appendix 4 - intangible assets goodwill excluded.....	66
Appendix 5 - Equity	67
Appendix 6 - Impairment charges	68
Appendix 7 - CGU allocation.....	69
Appendix 8 - Planning periods.....	70
Appendix 9 - Valuation techniques	71
Appendix 10 - Post-tax discount rates.....	72
Appendix 11- Pre-tax discount rates	73
Appendix 12 - Growth rates	74
Appendix 13 - ECB inflation rates.....	76
Appendix 14 - Disclosures	78

List of figures

Figure 1 - Goodwill position of the sample.....	26
Figure 2 - Variation of goodwill position of the sample.....	27
Figure 3 - Weight of goodwill over total assets.....	28
Figure 4 - Goodwill to total intangible assets ratio.....	29
Figure 5 - Goodwill to equity ratio.....	29
Figure 6 - Impairment charges to goodwill ratio.....	30
Figure 7 - Total impairments over the time horizon.....	33
Figure 8 - CGU allocation.....	34
Figure 9 - Average planning periods.....	35
Figure 10 - Valuation techniques used.....	37
Figure 11 - Discount rate disclosure of the sample.....	39
Figure 12 - Disclosures about rates.....	41
Figure 13 - Av. discount rates and growth rates of the sample.....	42
Figure 14 - Min and max g-rate of the sample.....	44

List of abbreviations

CA	Carrying Amount
NCI	Non-Controlling Interest
CAPM	Capital Asset Pricing Model
CGU	Cash Generating Units
DCF	Discounted Cash Flow
FV	Fair Value
FVLCD	Fair Value Less Cost of Disposals
GGM	Gordon Growth Model
GW	Goodwill
IA	Intangible Asset
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
MRP	Market Risk Premium
PV	Present Value
RA	Recoverable Amount
SME	Small and Medium-sized Enterprises
TV	Terminal Value
VIU	Value In Use
WACC	Weighted Average Cost of Capital

Introduction

There is much talk about goodwill, the treatment of which remains imperfect. Some believe that it does not even meet the proper definition of an asset, while others believe that it is precisely an asset. In the latter case, it is its accounting which is subject to debate. The accountancy in its very purpose, and especially for the IASB, is the true and fair presentation of the consolidated account as well as the substance of form. But what happens when the valuation is influenced by the economic environment, and particularly when it is left to the discretion of the participants? Would it still stick to the economic reality or would it be handled to reflect the company's interest.

The goodwill is a particular kind of asset inasmuch as it exists only by the business combination, the accountancy of internally generated goodwill being strictly prohibited. When an enterprise acquires another one, it will pay a price that is supposed to represent the fair value of the acquiree plus an extra price, which is either linked to expected synergies for the acquirer or to the purchase of a license or a patent not available on the market but owned by the acquiree. In the first instance, the so-called goodwill must be accounted. But let's remind ourselves the definition of an asset according to the IAS-IFRS standards: "an asset is a resource controlled by the entity as a result of past events and from which future economic benefits are expected to flow to the entity" [IFRS, 2013]. On the one hand, some say that the goodwill is from a business combination, only at its inception, and that after the acquisition, this goodwill is consumed and transformed into internally generated goodwill as there is not two companies anymore but only one. While the goodwill is still accounted and is still supposed to generate cash inflows from a former business combination and thus goodwill represents a resource from a past event but does not represent future economic benefits. On the other hand, if we keep in mind the idea that it is indeed an asset, the goodwill doesn't intrinsically generate cash flows from itself, and it must be allocated to cash generating units representing the lower level of an operating segment, which are supposed to benefit from this acquisition.

Then comes the question of the goodwill's treatment: should it be amortised as it was done in the past, leading to the question of the economic life time, or should it be impaired as it is the case at the moment?

The impairment as we know it is based on the present valuation of the goodwill for the future expected cash inflows. In finance, this kind of valuation is subject to several assumptions that can possibly be affected by the economic and politic environment. Furthermore, as the goodwill is created by the acquisition of an entity by another one, it is most of the time from a huge amount, meaning that a slight variation in one of those assumptions in the computation can lead to drastic variation in the present value.

The objective of this master thesis will be to determine whether the subprime crisis had an impact on the goodwill in the telecommunication industry or not. In that purpose, ten major companies from the telecommunication sector have been chosen within the European Union. This industry is known for its quite important proportion of intangible assets and of course goodwill. Moreover, the companies embedded in this sector are easily comparable, especially because every country has at least one operator and for an appreciable length of time, which makes empirical information available. Furthermore, these companies can be more easily compared, because they are from the same substance as they are similar in terms of core business. A time horizon of nine years has been chosen, starting on first January 2005 until thirty-one December 2013. This time horizon allows to capture both the period ahead of the crisis and after its effect became visible, if any. The choice of such period is linked to the fact that earlier, the treatment of goodwill was not standardised yet. Moreover, after 2013, all annual reports for the financial year 2014 are not yet available.

In order to achieve our objective, this thesis will be divided into two main parts. In the first part we will develop the theoretical points mainly provided by the IAS 36 about *Impairment of assets*. We will specify how to determine the inception of the goodwill initiated by the business combination. We will then discuss the goodwill in itself, declined in the determination of the cash generating units, the timing for impairment, the impairment test, the non-reversibility of the charges related to the test. We will finally consider the potential impact of the crisis.

The second part will first analyse the goodwill through different elements included in it. Will be examined the goodwill position of our sample in terms of amount and variations, as well as in terms of weighting, compared to other class of the balance sheet. Will also be studied the impairment charges carried out by our sample over the time period. An in-depth

focus will finally take place about the impairment testing, with the analysis of all the key assumptions required in the determination of the present value.

The end of this second part will be marked by an evaluation of other possibilities and the establishment of a critical analysis of the current method.

PART I

Theoretical Goodwill

I. Background

Prior to the 2000s, the European parliament started the harmonisation of financial statement through the 4th (relating to annual accounts) and the 7th (relating to consolidated accounts) European directives in 1978 and 1983 respectively. They were aimed at harmonising and not standardising accounting rules for European countries. Directives have no direct effect, there was no obligation for the Member States to fully adopt them. However, European companies that wanted to be listed on the US market had no right to do so as they had to establish their financial statements accordingly to the US-GAAP. Moreover, without any European standardisation it was almost impossible for the investors to clearly understand and compare financial statements. A non sense since the primary objective of a financial statement is to be read, understood and easily compared by investors. In order to enhance the harmonisation of financial information in a constantly growing globalisation, in July 2002 the European Union issued the European Regulation 1606/2002. The goal was to harmonise and provide transparency of the financial statements provided by all the publicly traded companies. Hence, from financial year 2005 onwards, each listed company as well as banks and insurance companies of the European union were obliged to publish their consolidated account consistently with the IFRS standards.

The IAS-IFRS standards are managed by the IASB. This foundation's purpose is "to develop a single set of high quality, understandable, enforceable and globally accepted financial reporting standards based upon clearly articulated principles"[IASB]. The foundation emits IAS standards especially concerning accountancy requirements and IFRS standards concerning disclosure requirements. Both are linked, and have to be considered as a whole by the companies applying the standards. Previously called IAS standards, it is now named IFRS standards as the foundation wants to focus on disclosure rather than on accountancy. The IFRS as adopted by the European Institutions, are based upon a number of guiding principles, such as substance over form, principle of fair presentation and compliance of the financial statements, unity, the going concern, materiality, offsetting, cut-off, etc.

In an effort to improve transparency as well as economic efficiency, the IASB introduced in 2004 the International Financial Reporting Standard 3 Business combinations

(IFRS 3) simultaneously with a revision of the International Accounting Standard 36 impairments of assets (IAS 36). Those standards replace former amortisation of intangible assets by impairment testing. They were aimed to better reflect the real use over time of the concerned asset rather than arbitrarily establish a definite useful life.

The complexity of the computation and the broad scope of discretion inherent to the application of the revised IAS 36 led to the enforcement of required disclosures with the introduction of IFRS 3.

II. At the inception of goodwill - The business combination

Goodwill generally arise from business combination, which falls under the scope of IFRS 3 Business combination and shall be capitalised. Conversely, internally generated goodwill shall not. Therefore, and before introducing the goodwill, it seems wise to provide with information about its establishment.

When an acquirer wants to buy another company, it is necessary to establish the fair price to pay. In order to do so, IFRS 3 requires the use of the "acquisition method", in which the acquirer must recognise all assets and liabilities including contingent liabilities and non-controlling interest at acquisition date fair value. The acquisition method is composed of 4 steps [IFRS3, 4]. Identifying the acquirer and the acquiree, identifying the acquisition date, recognising and measuring the identifiable assets acquired, the liabilities assumed and any non-controlling interest in the acquiree, and measuring goodwill or a gain from bargain purchase.

A. Identifying the acquirer and the acquiree.

In most cases it will not be difficult to determine the acquirer: it is the entity that obtains control over another entity, *i.e.* the acquiree. IFRS 10 consolidated Financial Statements provides guidance on the determination of the acquirer if necessary [IFRS3, 6-7].

B. Identifying the acquisition date.

The acquisition date will usually be the closing date, which is the date on which the acquirer legally obtains the control over the acquiree by the transfer of consideration, and thus acquires the assets and assumes the liabilities.

The consideration could be defined as the price paid by the acquirer in cash or in kind to the acquiree for the fair value at the acquisition date of the assets, the assumed liabilities and the equity interest issued by the acquirer [IFRS3, 8-9].

C. Recognising and measuring the identifiable assets acquired, the liabilities assumed and any non-controlling interest in the acquiree.

At the date of acquisition, the acquirer shall recognise every identifiable asset acquired, every assumed liabilities as well as any non-controlling interest. To be qualified as asset or liabilities identifiable for the recognition and measurement 3 criteria's are to be met. First, they must meet the definition of an asset and a liability in the IFRS framework. Second, they must be part of a business to be accounted under the scope of IFRS 3 otherwise it is not a business and assets and liabilities must therefore be accounted following to the related standards [IFRS3, 10]. Thirdly, they must be part of what the acquirer and the former owner traded in the business combination transaction rather than the result of separate transactions [IFRS3, 12].

The assets and liabilities must be classified on the basis of contractual terms, economic conditions and other conditions at the acquisition date in order to be treated by the relating IAS standard [IFRS3, 15].

The standard requires the non-controlling interest (NCI) to be measured firstly, at the acquisition date at its fair value (FV), based on market value of shares held by NCI. This will affect the goodwill, because in the FV method, NCI owns a part of goodwill. It can also be measured as the proportionate share of the FV of the subsidiary's net assets. Finally, it is possible for the acquirer, if the propositions here above are not applicable, to measure the FV of NCI using other valuation techniques [IFRS3, 18-19].

IFRSs provide with more details for different accounting measurements for several types of assets excluded from the scope. We will not develop further here as we want to focus on goodwill.

D. Recognising and measuring goodwill or a gain from a bargain purchase.

The IFRS requires the acquirer to identify goodwill as the difference between the aggregation of the transferred consideration, any non-controlling interest in the acquiree and, the acquisition-date fair value of the acquirer's previously held equity interest in the

acquiree if the acquisition was achieved in stages. Less the net of the acquisition date amounts of the identifiable assets acquired and liabilities assumed [IFRS3, 32].

Parent	100% →	Subsidiary
+ Transferred consideration		1000€
+ NCI		0€
+ FV of previously held acquiree's equity by acquirer (if any)		
- Net of acquired assets and assumed liabilities		800€
= GOODWILL		200€

Goodwill could economically be defined as the premium, embodied in the purchase price, an acquirer is willing to pay an acquiree for its going concern elements, for growth opportunities as well as potential economic benefits expected to arise from synergies generated by the take-over [PWC, 2011].

Goodwill could theoretically be defined as an asset representing future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognised [PWC, 2011].

III. Goodwill

Now that we have identified how goodwill is created, we will examine the way to deal with it.

As the goodwill does not generate cash flows by itself, it only exists because of return expected to arise from a business combination and thus from other assets or groups of assets to which it is allocated and it often contributes to cash flows of multiple CGU. Goodwill can neither be treated separately nor traded on a market place [PWC, 2011].

A. Cash generating units (CGU)

Goodwill needs to be allocated at the time of acquisition to cash generating units or to a group or cash generating units (CGU) that are expected to benefit from the synergy of the combination.

"A cash generating unit is the smallest identifiable group of assets that generates cash flows that are largely independent of the cash inflows from other assets or group of assets. IAS 36 provides us with an in-depth definition that states the CGU should not represent more than the lowest level within a company at which the goodwill will be monitored for internal management purposes, and cannot be larger than an operating segment" as defined by IFRS 8 *operating segments*.

"An operating segment is a component of an entity that engages in business activities from which it may earn revenues and incur expense, whose operating results are reviewed regularly by the entity's chief operating decision maker to make decisions about resources to be allocated to the segment and assess its performance and, for which discrete financial information is available" [IFRS8, appendix A].

At this point, managers already benefit from discretion as the goodwill allocation is left to their own interpretation. The CGU to which goodwill has been allocated can be larger than the lowest level at which the synergy is supposed to benefit, or even, it could be allocated to the wrong CGU [BDO, 2013].

The salient feature of the constitution of a CGU is obviously its ability to generate independent cash flows.

B. Timing of impairment test for goodwill

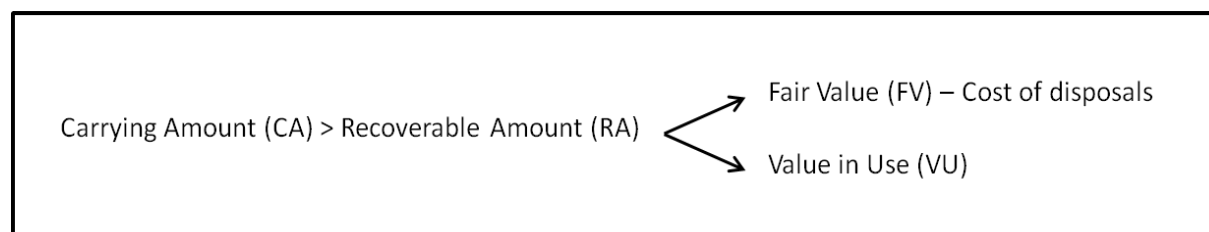
For any asset the standard requires, at the end of each reporting period, an assessment of whether there is any indication that an asset may be impaired. If this occurs, the entity shall re-assess the recoverable amount (*voy. supra*) of that asset.

The standard also requires an annual impairment test of the CGU or the group of CGU to which the goodwill has been allocated at least annually at any time during the financial year and whenever there is any indication that the unit may be impaired. In the subsequent years these tests must be conducted over the same period. Moreover, tests can be conducted at different time for different CGU [IAS36, IN13].

For intangible assets with indefinite useful life and intangible assets not yet ready for use, an annual impairment is required irrespectively of whether there is an indication that it may be impaired [IAS36, 10].

When a GW has been allocated during the financial year, the standard requires an impairment test to be performed before the end of the current period. It should be noted that if the allocation of goodwill between CGU or several CGUs cannot be completed before the end of the reporting period, then the allocation must be completed before the end of the financial period, starting after the acquisition date [IAS36, 84].

C. Impairment test



As mentioned above, every CGU or group of CGUs including a goodwill has to be tested for impairment at least once a year. The test consists in evaluating whether the

carrying amount of the asset or the CGU is higher than or equal to the recoverable amount of that asset or CGU. Otherwise it has to be impaired (*i.e.* bring the value of the asset back to its true value)

The recoverable amount is defined as the higher of either the fair value less cost of disposals or the value in use [IAS36, 6]. If, and only if, the RA of an asset is less than its CA, the CA of that asset shall be reduced to its RA. That reduction is an impairment loss and shall be recognised immediately in profit & loss [IAS36, 59].

1. Fair value less cost of disposals

IFRS13 *fair value measurement* is a quite new standard with the goal of harmonising the "how" to measure the fair value. Before, each standard concerned by the need of valuate any asset or liabilities has his own fair value measurement techniques, which could vary from one another.

Fair value is the price that would be received for the sale of an asset and for the transfer of a liability in an orderly transaction between market participants at the measurement date. This is also called the exit price [IFRS13, 9]. Unlike the VIU, the FVLCD is based on the market participant's perspective.

In order to measure the fair value, the entity must determine the particular asset or liability, for non-financial asset, the valuation premise appropriate for the measurement, the principal (or most advantageous) market for the asset or the liability and the valuation techniques [IFRS13, IN10]. A fair value measurement assumes that the asset is exchanged in an orderly transaction between market participants at the measurement date under current market conditions [IFRS13, 15].

It is important for the market participants to be independent, knowledgeable, able and willing to enter into transaction. On the one hand IFRS 13 requires the asset or group of assets to be considered for measurement as a market participant would measure it, *i.e.* in the current condition and location and considering any restrictions, if any, that would impact the valuation [IFRS 13, 11]. On the other hand, a non-financial has asset to be measured on the basis of its highest and best use from a market participant's perspective. Highest and best use is defined as the use of a non-financial asset from a market participants' perspective

that would maximise the value of the asset or CGU through its use in combination with other assets [IFRS13, 27-28-31].

The highest and best use takes into account physical possibility (*e.g.* property, location and size), legal possibility, financial feasibility, the use in combination of other assets and liabilities and the use of the asset or CGU in a different way than originally.

When determining the fair value, an entity shall use valuation techniques for which sufficient data must be available, maximises the use of relevant observable inputs and conversely minimises unobservable inputs [IFRS13, 61]. Moreover, valuation techniques shall be used consistently each time. However, a change is permitted for the purpose of equally or better reflecting the valuation of FV in the circumstances [IFRS13, 65].

If the transaction price is the FV at initial recognition and if in the future valuation techniques using unobservable inputs are used to determine the FV, then the valuation technique must be calibrated in order to equal the transaction price at initial recognition [IFRS13, 64].

IFRS 13 defines three main valuation approaches [IFRS13, 61-62]. First the market approach that uses prices and other relevant information generated by market transactions involving identical or comparable assets or CGU, such as business [IFRS13, B5]. Second, the cost approach which reflects the amount that would be required currently to replace the service capacity of an asset [IFRS 13, B8]. The cost approach is generally used to measure the FV of a tangible asset that are used in combination with other assets and liabilities [IFRS 13, B9]. Third, the income approach. It discounts expected future cash flows. This approach is measured on the basis of the value indicated by current expectations about those future amounts [IFRS13, B10].

IFRS 13 provides the fair value hierarchy that ranks in order of importance and relevance the inputs used to measure the FVLCD. The level 1 inputs includes quoted prices in active market for identical assets that entity can access at the measurement date. No adjustment is required. The level 2 inputs comprises inputs other than quoted prices included in level 1 that are observable for the asset either directly or indirectly. The level 3 inputs are unobservable. It encompasses for instance, financial forecast based upon

management's expectations. It is important to note that an entity must maximise the use of observable inputs.

The cost of disposals, other than those that have been recognised as liabilities, are deducted in measuring fair value less cost of disposal. Such cost are incremental costs directly attributable to the disposal of an asset of a CGUs, excluding finance costs and income tax expense [IAS36,28].

We summarised the FVCLD method as it is used by companies with goodwill to be impaired. But, according to a study from FSMA issued in 2010 upon goodwill impairment and disclosures on European listed companies as well as a ESMA's report issued in 2013 upon review of goodwill and other intangibles impairments in IFRS financial statements, 83% and 75% respectively of respondents uses VIU to determine the recoverable amounts of their CGU comprising a goodwill.

It can be concluded, as the FVLCD under IFRS 13 requires the maximisation of the use of external sources rather than internal ones and as the valuation of CGUs containing GW isn't tradable on a market through the use of binding sale agreement and is hard and not reliable to estimate in comparison to another company's acquisition of similar CGU, the determination of DCF under the scope of FVLCD appears to be a non sense since it needs the use of unobservable information. This is especially the case when IFRS standards give leading principles to determine it under VIU. Furthermore, because the FVLCD is based upon the notion of a market participants' point of view, it seems quite difficult to determine what will the future cash flows effectively be as the DCF computations is supposed to be based upon recent cash flows forecast from management's point of view [Stahlberg, 2013].

2. Value in use

IAS36 defines value in use as: "the present value of future cash flows expected to be derived from an asset or a CGU" [IAS36,6]. Value in use is generally computed tanks to the discounted cash flows method (DCF) [BDO, 2013; Forest et al, 2013] and with the Gordon growth model (GGM) [Rotkowski, Clough, 2013] *voy. infra*.

IAS 36 also states that the following elements shall be reflected in the computation of an asset's value in use: "an estimate of the future cash flows the entity expects to derive

from the asset, expectations about possible variations in the amount or timing of those future cash flows, the time value of money (discount rate), the price for bearing the uncertainty interest in the asset, and other factors that market participants would reflect in pricing the future cash flows" [IAS36,30].

Moreover, the standard requires to estimate the future cash inflows and outflows to be derived from **continuing** use of the asset and from its ultimate disposal, and, apply appropriate discount rate to those future cash flows [IAS36,31].

a. Estimating future cash flows

There exists plenty of calculation methods, such as the DCF as mentioned here above and the residual income model [Herz, et al, 2001]. However, none of them is mandatory. When estimating the expected cash flows of an asset or a CGU with a definite useful life, the DCF is sufficient in itself nevertheless, in regards of the present value (PV) computation of goodwill, the particularity of its indefinite useful life leads to the need to approximate a terminal value which is computed by means of the Gordon growth model (GGM)¹.

$$PV \text{ of CGU} = \underbrace{\frac{CF1}{(1+WACC)} + \frac{CF2}{(1+WACC)^2} + \frac{CF3}{(1+WACC)^3} + \frac{CF4}{(1+WACC)^4} + \frac{CF5}{(1+WACC)^5}}_{DCF} + \underbrace{\frac{[FCF5*(1+g)]}{(WACC-g)}}_{GGM}$$

CF = cash flow
WACC = discount rate
g = growth rate
FCF = final cash flow

First, the forecast period using DCF method is the present value of future expected cash flows discounted by the WACC (*voy. infra*). Value in use is thus a valuation of an asset or a CGU today, about what management reasonably and supportably expects to generate in the future and in its current condition. Cash flows expectations are based on management's most recent budget. The standard limits the forecast to a five-years period, unless the contrary can be justified. Forecast shall be computed on the basis of probability of occurrence rather than on a single most likely cash flow [IAS36, A7] and shall be based

¹ There are other ways to calculate the TV but GGM is the most used [rotkowski, et al, 2013; BDO, 2013; FSMA, 2012]

consistently with past outcomes. Cash flows forecast also includes any net cash flows upon disposal. However, they shall exclude any cash inflows or outflows expected to arise from future enhancing or restructuring the asset's performance [IAS36, 33]. Only cash outflows inherent to the generation of cash inflows can be attributed. Are also excluded the outflows needed to prepare the asset for use [BDO, 2013]. Financing activities as well as income tax receipts or payments should be excluded from the computation.

Second, the terminal value is the period beyond the five-years term. It is an estimation of the present value of the last cash flows on an indefinite life basis on which a long term growth rate (g^*) is applied. This rate shall not exceed the average long term growth rate for the product, industry or the country in which the entity operates or the market in which the asset is issued, unless a higher rate could be justified [BDO, 2013]. Moreover, Rotkowi et al, add that the g -rate determination shall be based on qualitative considerations, such as historical growth, growth from existing assets, growth to internally developed assets or growth by acquisitions, but also on quantitative considerations, such as inflation and trends of increase or decrease in historical cash flows [Rotkowski, 2013].

Growth rate shall vary from a CGU to another except if they face the same circumstances and environment. In practice the LT growth rate should be steady or declining [BDO, 2013].

b. Discounting

The discount rate shall be a pre-tax rate that reflects current market assessments of "the time value of money, as well as the risks specific to the asset for which the future cash flow estimates have not been justified" [IAS36, 55]. In case of the use of a post-tax rate, it is important that cash flows projections are based on a post-tax basis as well and then the pre-tax rate can be find by using an iterative method [BDO, 2013].

The standard requires the use of a rate that reflects the market participants' expectation of time value of money and the bearing risks as well as the opportunity cost of the asset if they had invested the same amount in a placement with the same time horizon. Alternatively, the standard allows the use of the Weighted Average Cost of Capital (WACC) or that of a listed company with the similar asset or CGU [IAS36, 56]. In practice the WACC is

often used [FSMA, 2012]. Although the growth rate is entity specific, discount rate is not. Furthermore, it must be consistent with assumptions made to cash flows computations. for instance if a huge growth rate is used in the TV computation, the discount rate should be adjusted to reflect the risk of non achievement [BDO, 2013].

However, if the risk assumptions varies from a CGU to another, then a specific discount rate must be applied consistently with that CGU [FSMA, 2012].

An entity's WACC is defined as the cost of capital in order to satisfy both his debtor and his shareholders. It requires to determine the cost of equity and the cost of debt and weight these costs for the capital structure [FSMA, 2012].

WACC can also be derived from peer group only if the specific risks associated to the CGU do not diverge from that of the peer [PWC, 2013]. Hereafter is the WACC formula, elements of which will be described just below.

$$WACC = [R_d * (D / (D + E))] + [R_e * (E / (D + E))]$$

R_d = cost of debt

R_e = cost of equity

D = debt

E = equity

First, the cost of debt (R_d) is literally the cost an entity pays for its debt. It is the entity's financing cost, which generally comprises the aggregate of the risk-free rate of jurisdiction in which the entity operates, and a risk premium specific to the asset or CGU. It is also possible to take the latest borrowing rate taken out with a third party at arm's length [BDO, 2013].

Second, unlike the cost of debt, cost of equity (R_e) is hard to determine, because it is not observable from the market. It is hard to evaluate what is the return expected by equity investors as it depends on the market, the industries, the companies. Therefore, the cost of equity is generally determined through the use of the capital asset pricing model (CAPM)[PWC, 2013].

$$\text{CAPM} = R_e = R_f + [\beta * (R_m - R_f)]$$

R_f = risk free rate

β = beta

R_m = market return

$R_m - R_f$ = market risk premium

The CAPM can be summarized as either the time value of money represented by the risk-free rate plus the reward for an investor for bearing an additional risk measured by the beta coefficient compared to the market premium (*i.e.* the sensitivity of a stock's return to the market return). *Ceteris paribus* it represents the cost for the entity to capture investor's incentives to invest in its equity. The CAPM is composed of several parameters as described below [Finch, et al, 2011].

First, the risk free rate is easily determinable as it could be chosen accordingly to the long term government bonds from the country in which the entity operates. In case of computation of TV and thus infinite, a ten-years period government bond should be used. However, the risk-free rate must match the inflation hypothesis as well as the maturity horizon of that expected cash flows [BDO,2013].

Second, the market risk premium (MRP) is the difference between the expected market return and the risk free rate. Like the risk free rate, the MRP must meet the terms of cash flows expectations.

Third, the beta (β) measures the market risk of the asset compared to the market. Market risk is an addition of diversifiable risk and systematic risk which cannot be diversified (*e.g.* inflation, economic or political risk, inherent to the stock) [Finch, et al, 2011].

Therefore a beta equal to one means that the stock has the same risk as the market. Here after is a small table summarizing the beta is effect.

Value of β (decending)	Movement direction	Movement magnitude	Common example (shares and other Instruments)
$\beta > 1$	Same as the market	Greater than the market	Volatile share prices influenced by daily market news (i.e. start-up companies, entities in certain industries such as technology etc.).
$\beta = 1$	Same as the market	Same as the market	Shares in larger mature entities that are a significant contributor to the market.
$0 < \beta < 1$	Same as the market	Less than the market	Shares in stable entities producing staple goods and services that are not as susceptible to day to day market fluctuations.
$\beta = 0$	Movements in share prices are uncorrelated with the market		Any form of a fixed-yield instrument whose return is independent of market movements.
$\beta < 0$ (‘negative beta’)	Movements in share prices are in the opposite direction to movements in the market		Certain ‘investment’ commodities (such as gold) typically move in the opposite direction to the market (i.e. when the share market falls, participants typically move to interests in these ‘investment’ commodities as they are seen as a more stable and appreciating investment).

Source: BDO 2013

In order to determine the beta, it is necessary to take into account occurred modifications factors to the specific CGU (if any) and convert from a leveraged beta to an unleveraged beta. The leverage beta includes financial effects from leverage (*i.e.* including the financial effects from leverage, it's an entity financed by debt and by equity) while unlevered beta doesn't [FSMA, 2013].

Generally speaking, an entity is supposed to use a leveraged beta corresponding to the typical market on which the entity operates. However, an entity may comprise numerous CGUs. In such a case, the entity that has access to an unleveraged beta for each CGU (*i.e.* not including leverage, entity fully funded by equity) must apply leverage to the entity-level unleveraged beta [BDO, 2013].

It can be concluded that the determination of the value in use of a CGU is subject to tremendous discretion of the management. All parameters that are taken into account to determine the recoverable amount of a CGU are called the "key assumptions". For instance, high cash flow expectations are key assumptions of high growth rate, but must be discounted accordingly, as risk rises. Indeed, computation is based upon management's cash flows expectations, on the choice of growth rates as well as discount rates on a discretionary basis. The standard requires clear disclosures about key assumptions used [IAS36, IN17] but

one would say that frequently the disclosures on key assumptions are insufficient and too general [FSMA, 2012]. Furthermore, from an economic crisis point of view, the assumptions used to determine the recoverable amount of a CGU are even more critical [Camodeca, et al, 2013]. Moreover, a slight variation can have considerable effects on the final valuation, especially when we know that goodwill is generally very large amounts [Rotkowski, et al, 2013].

D. Non reversibility and management incentives

Now that we have clearly explained the issues relating to the goodwill impairment, it seems important to conclude with the non reversibility of an impairment on goodwill. Indeed, the standards state that once an impairment on a goodwill has been carried out, it is definitively and forever [IAS36, 124]. Management will tend to use the discretion they have on computation and disclosure to optimise their utility [Trottier, 2013]. For instance, managers are likely to avoid or at least minimise goodwill impairment [Seetharaman, et al, 2005]. Contrarily, they may use the goodwill impairment's non reversibility as income smoothing [AbuGhazaleh, et al, 2011].

IV. Financial crisis

As mentioned previously, the present value computation of CGU comprising goodwill is subject to considerable discretion, even more in the period concerned by the financial crisis we experienced. It is largely admitted that the commonly used PV computation is the DCF method which comprises the so-called terminal value which could in some cases represent more than 75% of the PV in a whole [Rotkowski, et al, 2013]. DCF is subject to management expectations and estimations in a way that the different elements comprised in its computation (*i.e.* the key assumptions) are subject to high level of uncertainty in projections [Patel, et al, na]. Therefore, through the study on the goodwill impairment of ten major telecommunications companies in the European Union we'll try to highlight what impact the financial crisis truly had. Some contributions in the literature provide *inter alia* with some possible effects described here after. They will particularly be the subject of research questions in our study.

Firstly, in recession time the cash flow projections are subject to riskiness for the uncertainty of achievement in realisations and in time horizon [PWC, 2013], especially when the cash flows expectations are optimistic. The management is supposed to estimate the forecast based upon past experience as well as on past income derived from the CGU, but are those assumptions still reliable ? Indeed, during the crisis the volatility rose and market expectations decreased due to the turmoil left by the sub primes crisis and the fall down of the too big to fail Lehman Brothers [PWC, 2009]. Camodeca, Almici and Bernardi have demonstrated among other things "the high discretionary level of the process and in general the lower degree of reliability of the fair value accounting in a context of financial turmoil "[Camodeca, et al, 2013].

Secondly, because of the need of determination of the WACC as discount rate, which is also largely considered as the usual method of discounting, the cost of equity emphasized in the computation appears to be the crux of the problem. Indeed, as explained with the CAPM, investors are willing to invest in a company's stocks as long as they are rewarded for the additional risk borne. Nevertheless, if they become more risk adverse, it becomes more and more difficult to raise capital. Yet it appears that companies use a high discount rate (between 9% and 25%) which characterises a prudent approach [Camodeca, et al, 2013].

Thirdly, the here above mentioned TV is generally calculated thanks to the Gordon Growth Model and it needs the computation of the growth rate which has a huge impact on the model. Moreover "the g-rate must be consistent with the metric being measured that is cash flows"[Rotkowski, et al, 2013]. The growth rate is also concerned by empirical results of the firm, and for this reason special care must be allocated to the economic factors that led to those results and if they are still valid. In general, if a company decides to use a g-rate higher than inflation, they assume that they will out-perform the economy indefinitely [Rotkowski, et al, 2013].

Another point on which we will focus is the CGU allocation. Even if the crisis had no real impact on that, as briefly introduced in the CGU section, it is still a tool for managers to avoid or reduce impairment and smooth earnings. As suggested by the agency theory, they will always try to optimise their utility [Trottier, 2013]. In order to do so, they will use accounting discretions like CGU allocation which is one of the most important of them [AbuGhazaleh, et al, 2011]. We will try to find out if companies could have changed the size of their CGU.

PART II

Goodwill in the Telecommunications industry

I. Goodwill

In this chapter we will analyse the goodwill and all the elements associated, in order to determine whether the key points we have underlined in the financial crisis section have actually played their roles in the goodwill section of the entities in our sample. Therefore, we will focus on the goodwill position and especially on its variation and on several ratios, before we turn to impairment charges, followed by the key assumptions involved in the impairment testing.

A. Goodwill position of the telecom industry

1. Total goodwill position of the sample

In the first instance, this study naturally examines the goodwill position of the sample. In time of crisis, one might expect a decline in goodwill around 2008. The result of this study shows that indeed the mean of the total goodwill of the sample slightly decreased in 2008 and raised in 2010 after which it plunged again in the subsequent years.

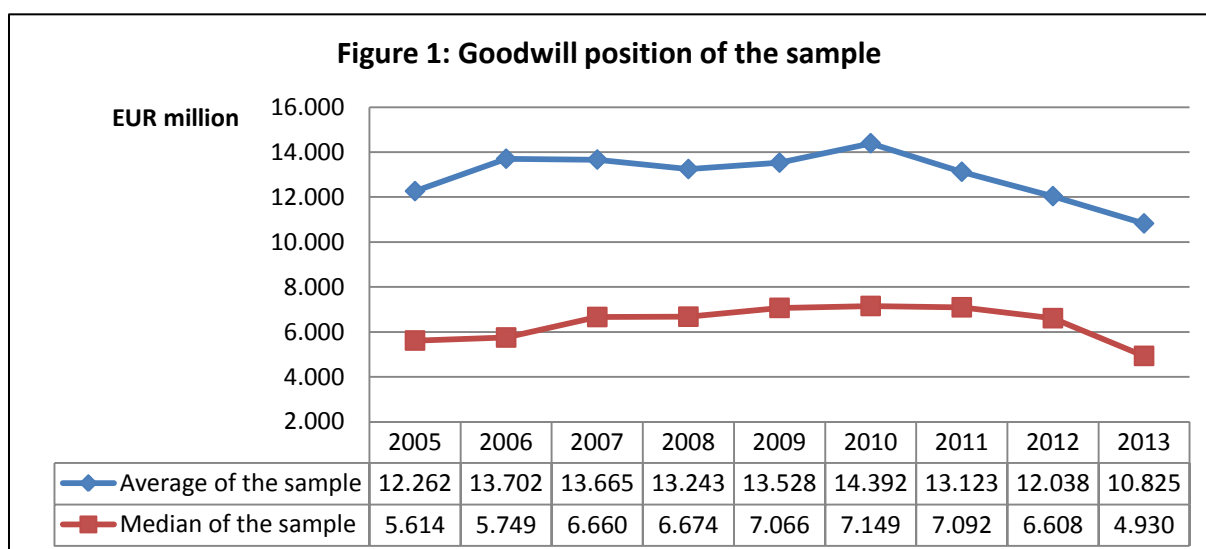


Figure 1 - Average and median of goodwill position of the sample computed from January 2005 to December 2013.

The median highlights that the average is conducted by one or more companies. Indeed, companies such as Orange, Deutsche Telecom and Telecom Italia account goodwill

for more than fifteen billions euros while the rest of the sample is generally below five billions.

Therefore, and to make figures more comparable, the following plot shows the goodwill thanks to the use of variation between t and t-1 so that the outstanding goodwill positions will not bias tendencies of goodwill position in the sample.

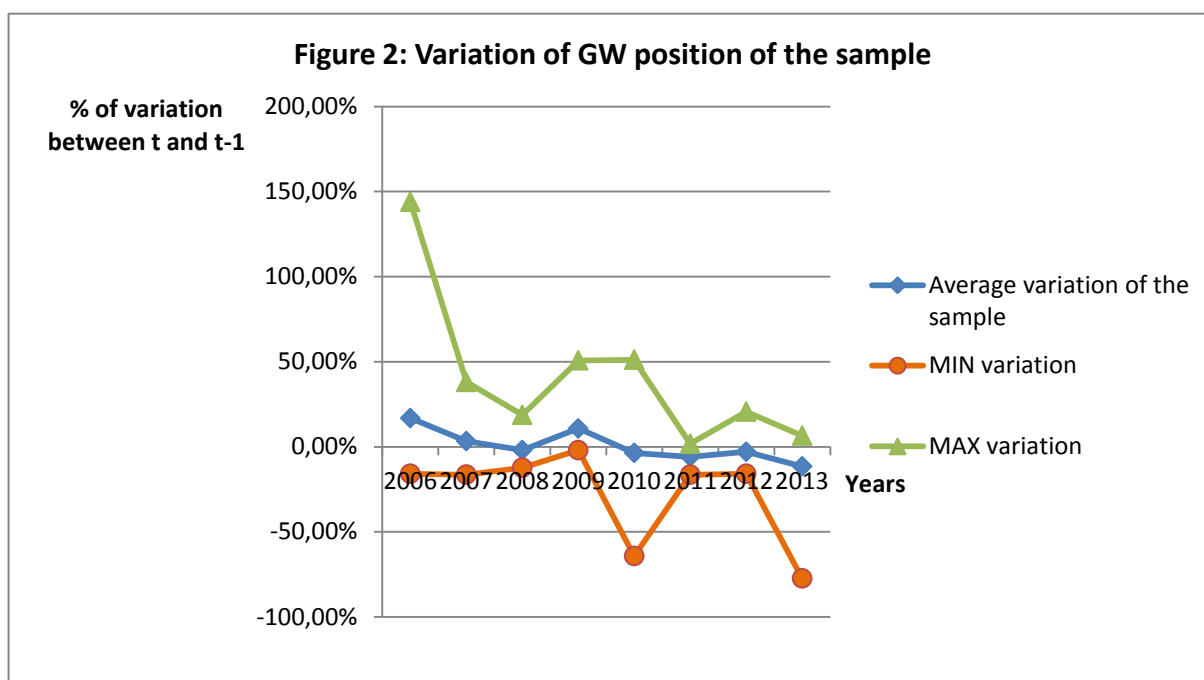


Figure 2 - Average (diamond line) of the sum of the variations between t and t-1 for each company within the sample each year, $(\text{goodwill } t - \text{goodwill } t-1) / (\text{goodwill } t-1)$. Plus the maximum (triangle line) and the minimum (dot line) variations recorded each year.

Figure 2 highlights a tendency for the sample of increasing positive variation of the goodwill position in 2009 due mainly to an increase of 50% of the goodwill position of BT group (UK) rising from EUR billion 1,1 to EUR billion 1,7. Afterwards, on average, the total goodwill position of the sample tends to slightly decrease over time which is, especially led by a write-down of 62% for Portugal Telecom in 2011. The inception of the max variation line is due to an increase between 2006 and 2005 of 143% of Telefonica's goodwill position.

From a global perspective, the sample's total amount of goodwill accounted for the financial year 2005 is 122.618 million euros and 108.246 million euros for the financial year 2013. At first glance, surprisingly, in 2009 the goodwill position of the sample seems to increase and from the years 2010 and subsequent years, the goodwill tends to fall down. In

the following sections we will focus and develop the tendencies and compare those first intuitions with the impairment charges tendencies as well as with the analysis of the key assumptions required in the determination of the recoverable amount.

2. Goodwill ratios

The main objective is to provide an idea of the proportion the goodwill can reach in the balance sheet of the companies embed in the sample. It also gives a view of the variation of goodwill compared to other general classes of assets and liabilities.

Figure 3 gives a global view of the weight of the goodwill over the total assets of our sample. The proportion stays steady with a slight peak in 2008 until 2010 following by a slight fall which is consistent with figure 2. This ratio is often used to compare companies with each other, and it provides an idea of the proportion of goodwill over the total asset a company with a high level of goodwill being more subject to impairment of its assets. It can also give insentives about the aggressivity of the company on its concerns about mergers and aquisitions.

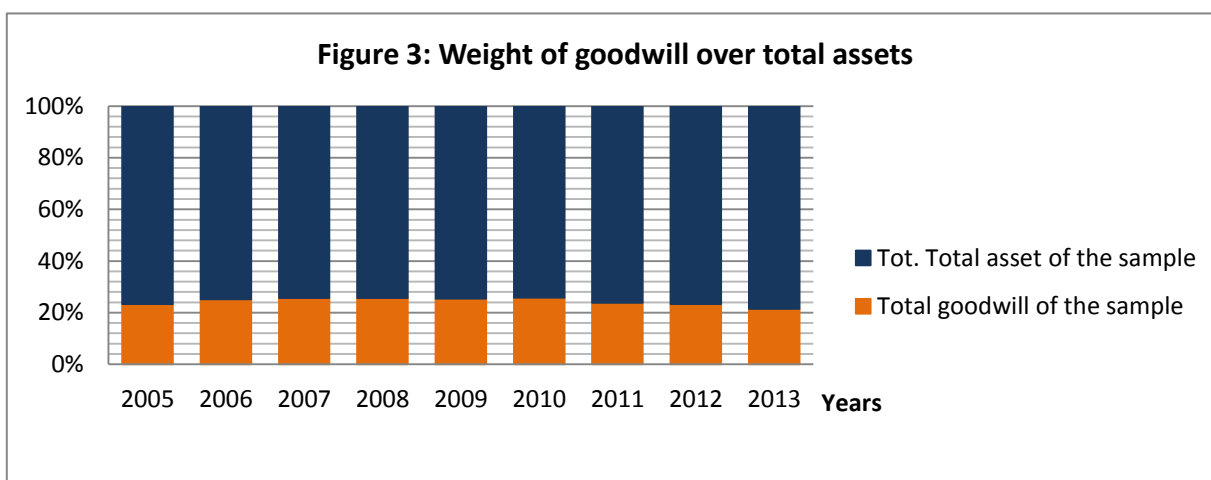


Figure 3 - Illustration of the average weight of the goodwill position over the total assets position of each company for each year.

In order to provide the reader with an idea of the weight of the goodwill over intangible assets (IA), figure 4 shows that, on average, goodwill represents about 60% of IA, which means that goodwill constitutes a majority of the intangible class of asset.

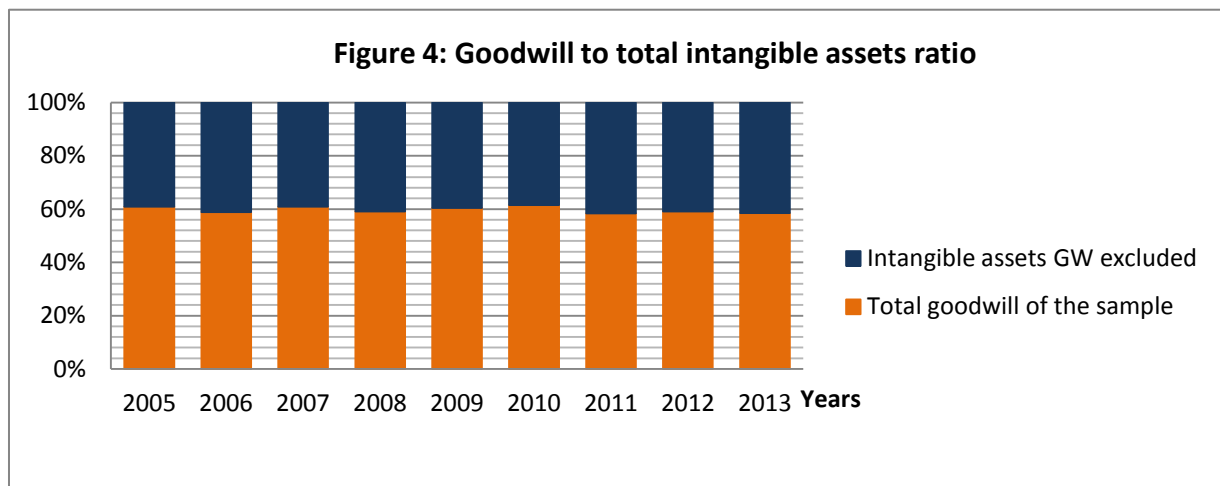


Figure 4 - Illustration of the average weight of the goodwill position over the total intangible assets position of each company for each year.

Figure 5, the goodwill to equity ratio, has skyrocketed in 2006 and 2009 and has collapsed in 2013. It is worth noting that, as the equity is composed of retained earnings or retained losses, it may lead either to computations with a low denominator, or even sometimes with a negative one. Therefore, the equity value strongly influences this figure. In a purpose of consistency, the sample remained as it was, but special care must be taken when assessing this plot. For instance, the 7,6% is mainly due to an equity value for BT group in 2013 of -303 million euros, compared to a goodwill position of 1.749 million euros. It is also worth mentioning that the ratio excluding BT group for the same year is 70,47%. In addition since 2010, goodwill position as well as equity go down.

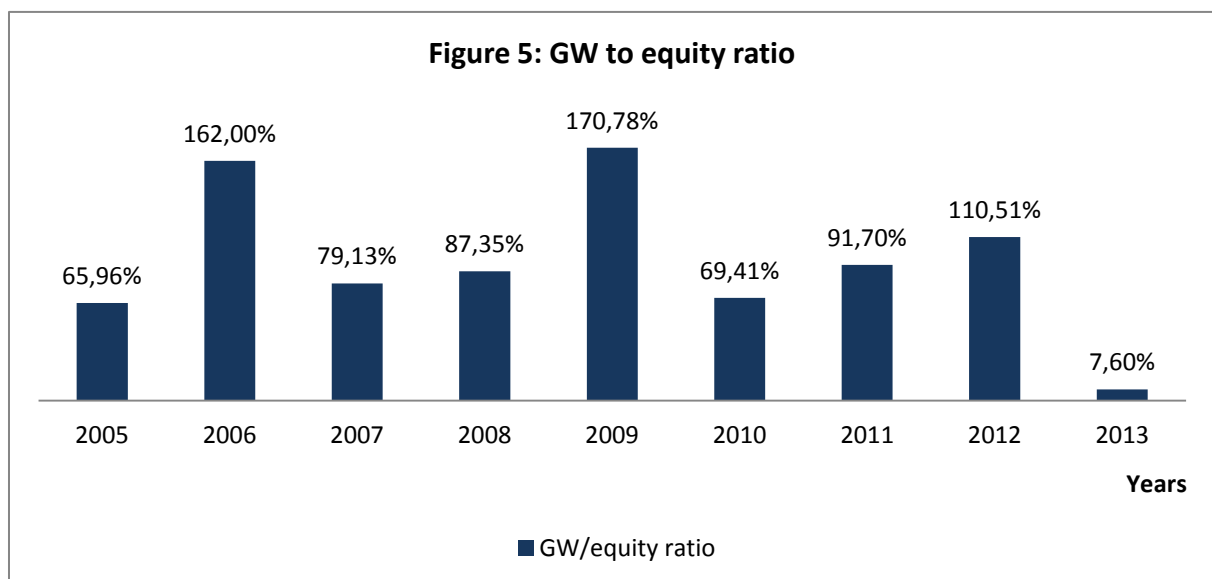


Figure 5 - Illustration of the average weight of the goodwill position over the total equity position of each company for each year.

B. Goodwill impairment charges

As mentioned previously, in order to compare the figures with one another, the impairment charges are expressed as percentage of their respective goodwill. Note that for previous and following charts, the percentage of variations and ratios are always expressed as the sum of the variations and not as variations of the sums. Indeed, the latter is not representative of the sample at all since every variation would be absorbed by a bigger one. As a result, figure 6 is composed of three elements. Firstly, the average variation of impairment charges over their respective goodwill position, carried out by the sample each year. Secondly, the median of variation of the ratio. Finally the number of impairments carried out by the sample every year. The chart is marked by significant tendencies in impairment in different years.

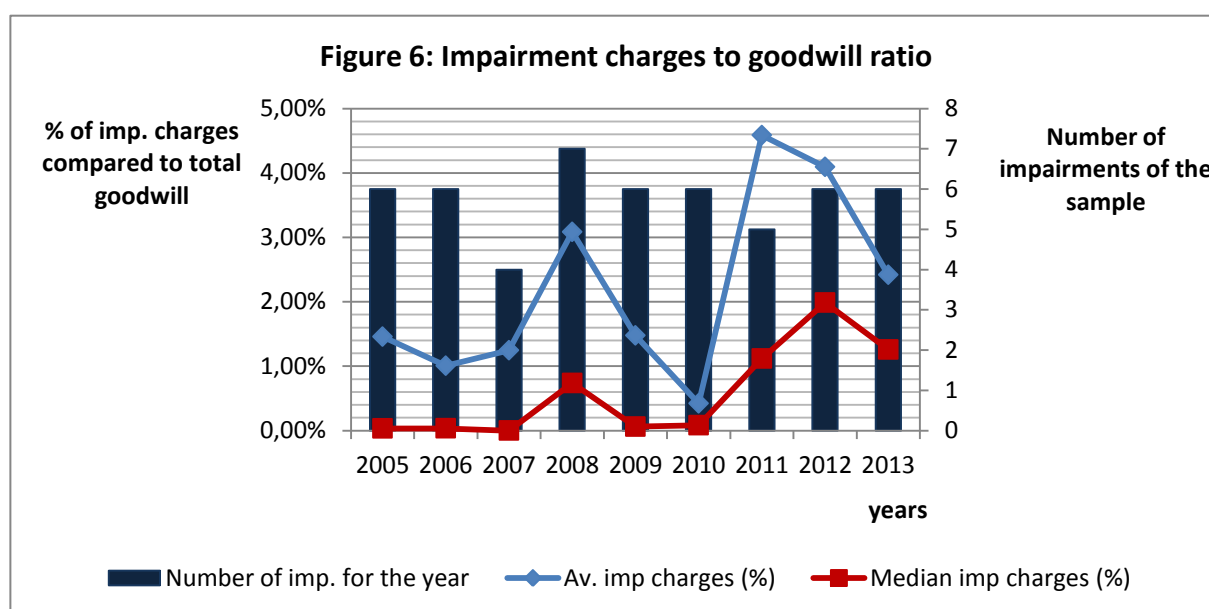


Figure 6 - The left-hand side represents the percentages of impairment losses against the total goodwill position, with the diamond line representing the mean and the square line constituting the median. On the right-hand side lies the total number of impairment carried out by the sample each year.

Firstly, the year 2008 has been impacted significantly by impairment charges in importance and in frequency, as seven out of the ten companies reported an impairment loss. For instance, Deutsche Telecom had in the first place performed an impairment test in September 2008, which did not lead to an impairment loss to be recognised. Afterwards, macroeconomics environment appearing to worsen, like discount rates becoming volatile, unfavourable regulatory decisions regarding future incomes, the company retook the test

which led to impairment loss of 289 million euros. Meanwhile, KPN (Netherlands) recognised *inter alia* an impairment loss of 67 million euros out of 125 for the collapse of the stock price of one of its acquired company [KPN, 2008]. TDC (Denmark) recorded an impairment loss of 564 million euros mainly due to overestimated cash flows' forecasts and to increased discount rates [TDC, 2008]. For its part, Orange (France) accounted a loss of EUR million 271, due to the overestimation of cash flows forecasts and for political troubles in an abroad CGU [Orange, 2008].

Secondly, 2011 is the year with the highest rate of impairment losses. Even though "only" half of the sample records a loss that year, the amounts registered are relatively high. On the one hand, deutsche Telecom recorded for 3.100 million euros impairment loss due to several reasons. First, the United States CGU is facing a harsh pressure on margins on the market as well as an intensification of competition. Besides, the Europe CGU is confronting with continually uncertainties in regards to the economic growth prospects of the gross domestic product, which is a consequence of an increasing competitiveness on the European market. Finally, the Greek debt crisis resulting in the increase in discount rates has led to a negative impact on the goodwill position of the Greek CGU [Deutsche Telecom, 2011]. On the other hand, Telecom Italia performed the impairment tests twice on its CGU "core business", each of which contributing to the recognition of losses, 3.182 million euros and 4.125 million euros respectively, for a total impairment of 7.364 million euros. These impairment charges are mainly due to an increased cost of capital through the rise of sovereign securities' long term rates in Italy [Telecom Italia, 2011]. Telecom Italia added that the macroeconomic environment and market climate were slowing down by the increasing fear of a recession. Leading to deterioration of the financial market with regards to interest rates and revenues expectations.

Thirdly, the year 2012 has nothing to envy of the preceding year. Indeed, there is only a slight smaller percentage of impairment loss but, 6 out of 10 companies recognised one. Once again, this year Telecom Italia impaired for EUR million 4.289 mainly on the "core business" CGU again. Another important impairment charge this year is attributable to Orange which recognised a loss for 1.732 million euros concerning CGUs comprising East-Europe countries as well as to a lesser extent Belgium and Egypt. The reasons related to

those impairments can be, a competitive pressure, a decreasing turnover due to the economical and political contexts and an increase in discount rates [Orange, 2012].

Finally, the year 2013 is driven by one large impairment loss from Telecom Italia anew, with 2.187 million euros on the "Core business" CGU. Due to the macroeconomic situation deterioration, from an Italian economy point of view and wrong management expectations on forecast [Telecom Italia, 2013]. Another quite significant impairment loss is recognized by Orange for an amount of 512 million euros, due to increased competitiveness on the Belgian market leading to a decline in price levels [Orange, 2013].

It is noteworthy that in our sample, some of the companies have recorded very few impairment losses over the time horizon. For instance, Portugal telecom has impaired only twice, one time in 2005 and the other time in 2013, though their level of goodwill has decreased considerably over time, especially after 2009 with a closing goodwill of 1.162 million euros declining in the financial year 2010 to 416 million euros. This was mainly accountable for changes in consolidation perimeter with the disposals of their CGU Vivo [Portugal Telecom, 2010]. Another burning issue consist in adjustments in order to comply with several IFRS standards in the financial year 2013 of the annual report of 2012 and 2011. In regards to goodwill, IFRS 11 led to a negative restatement for the goodwill position of 2012 of EUR million 1.024 as well as for a negative restatement in 2011 of 1.150 million euros.

Portugal Telecom EUR million	Prior restatement GW position	After restatement GW position
2011	1.297	353
2012	1.449	426

The change brought by IFRS 11 is, as disclosed by Portugal Telecom, no longer proportionally consolidation of investments in joint ventures [Portugal Telecom, 2013]. As these are restatements, and thus because neither charges nor write downs have impacted the financial statements, we decided to take into account in our computation of goodwill

position and all arising computations, the restated values for the year impacted by the restatement, namely, in 2010 and in 2011.

The figure 7 provides us with the number of impairment charges done by each company over the nine years time horizon.

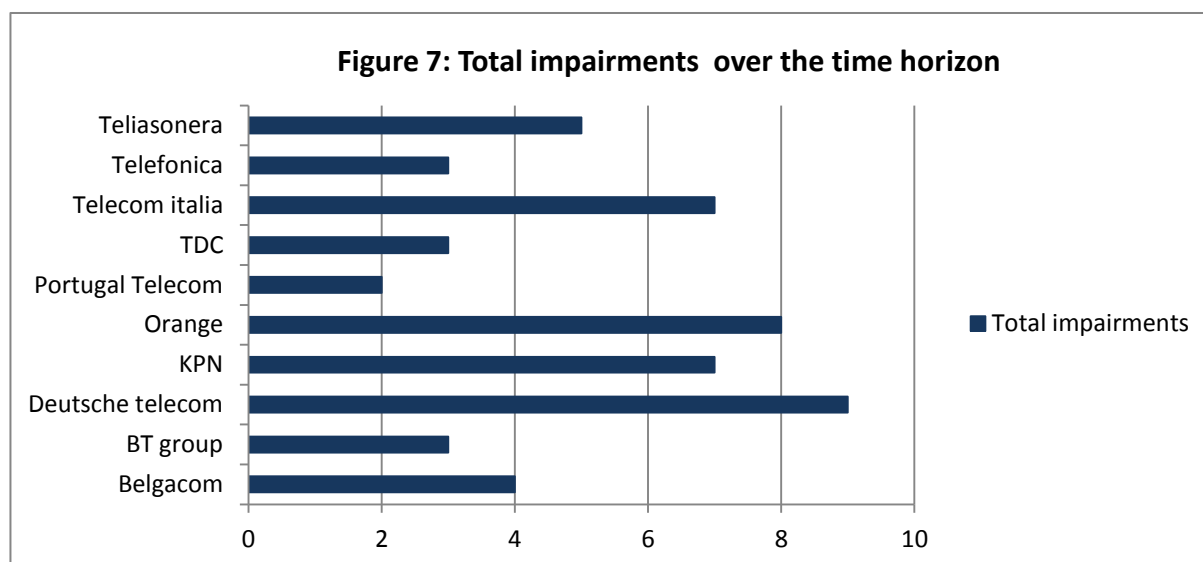


Figure 7 - illustration of the number of impairment losses carried out by each company over the time horizon of nine years.

Figure 6 is close to be perfectly consistent with figure 2. Indeed while in 2008 impairment charges rose, the goodwill position felt down, in 2009 goodwill position increased and impairment charges lowered. It is only in 2010 where the goodwill position variation slightly fell down that the impairment were at their lowest level. This can be explained by the decrease in goodwill position of Portugal Telecom and TDC in 2010 while none of them disclosed impairment charges that year which is explained by disposals of CGU.

This section on impairment charges can be summarised in essentials points regarding the reasons for their existence. First, in 2008, the macro-environment seems to have worsen, which resulted in discount rates being volatile and heightened, and, in over-estimation of future incomes. Since the DCF model is *inter alia* based on cash flows expectations arising from management predictions, based, among other things, on past experiences; and because of the significant weight the discount rate represents in the DCF computation, one might think that the crisis, if it has not directly impacted the whole

economy nor every specific entity, nevertheless makes for sure the future climate unpredictable. Therefore, special care should have been allocated, notably to the feasibility of the prediction.

Second, in 2011, on the one hand market pressure seems to have risen, with consequences on margin pressure and thus on the lowering of potential turnovers. On the other hand, the uncertainty left by the crisis upon economic growth has created the fear of recession asides. The cost of capital (*i.e.* the discount rate) rose, while growth expectations fell down.

Finally, 2012 and 2013 are also concerned by incomes over-estimation by the management, which are still the result of the economic and political context of uncertainty. The DCF formula here after will highlight the different affected parameters.

$$\text{PV of CGU} = \frac{\text{CF1}}{(1 + \text{WACC})} + \frac{\text{CF2}}{(1 + \text{WACC})^2} + \frac{\text{CF3}}{(1 + \text{WACC})^3} + \frac{\text{CF4}}{(1 + \text{WACC})^4} + \frac{\text{CF5}}{(1 + \text{WACC})^5} + \frac{[\text{FCF5} * (1+g)]}{(\text{WACC} - g)}$$

↑
Higher discount rates
Reliability of cash flows expectations lowered
↓
↑
Growth expectations lowered

C. Testing goodwill for impairment

1. Cash generating unit allocation

As a reminder, IAS 36 requires the goodwill to be allocated to cash generating unit that is expected to benefit from the synergies resulting from the business combination. A cash generating unit (CGU) is the smallest group of assets that generates cash flows that are largely independent of the cash inflows from other assets or group of assets. A CGU must not be larger than an operating segment as defined by IFRS 8 *operating segments* (*cfr*: section A: cash generating units).

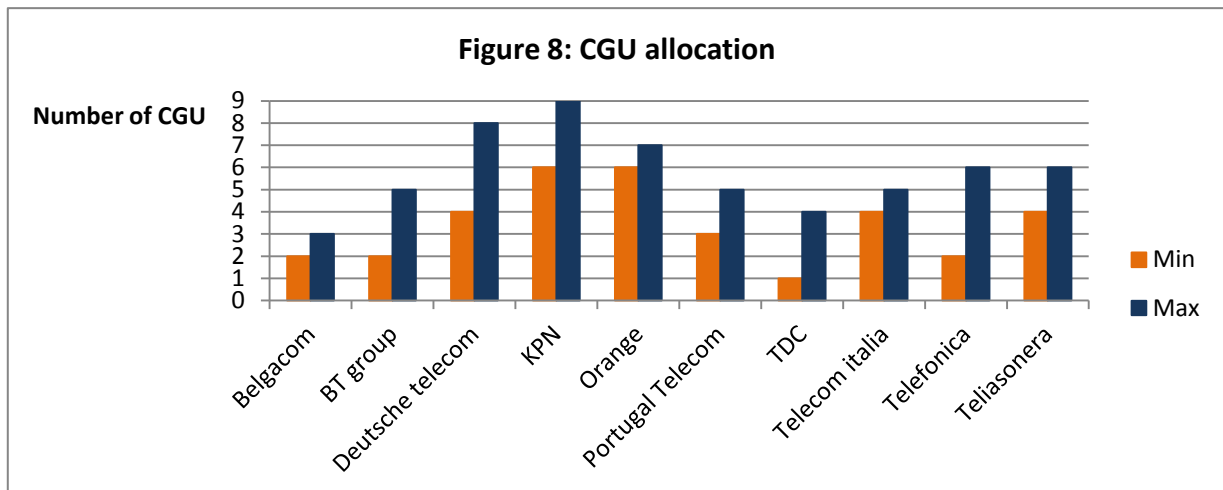


Figure 8 - Illustration of the minimal and the maximal number of CGU to which goodwill have been allocated for each company over the time horizon of nine years

According to the annual reports of each of the company in the sample, 100% of them disclose that their amounts of CGU is equal or larger than their amount of operating segments, meaning that they all comply with this requirement.

Figure 8 provides us with the minimal and the maximal amount of CGU the companies have recorded over the time horizon. As mentioned previously in the CGU allocation as well as in the financial crisis sections, management is likely to use the CGU allocation as it suits them. It is easily feasible to re-allocate goodwill, to up size or to down size a CGU in order to absorb potential loss of an operating segment. Indeed, even if IFRS 8 *operating segment* provides a clear definition (*cfr supra*) of what an operating segment must be, it is left up to management judgement to determines its size and motivate its choice.

Nevertheless, it appears that in general, the number of CGU stays constant over time. Companies in our sample didn't seem to adapt the size of their CGU. The major reason of one more or one less CGU is the acquisition or the disposal of an entity constituting the CGU in question. At any rate, in the disclosures made by the entities on their allocation and movement if any, they are all in accordance with the standards, and have allocated GW at the lowest level at which a segment operates.

2. Planning periods

The value in use computation comprises two phases. Firstly, the cash flows forecast predicted by the management and among other things, based on past experience, is the planning period. IAS 36 requires this planning period not to exceed 5 years unless it can be duly justified. Secondly, the computation of the terminal value (TV) represents the infinite growth of the asset beyond the planning period, based on the last cash flow (*cfr*: section C: impairment test). On average the entities uses a 5 years' budget forecast, which sometimes can be reduced.

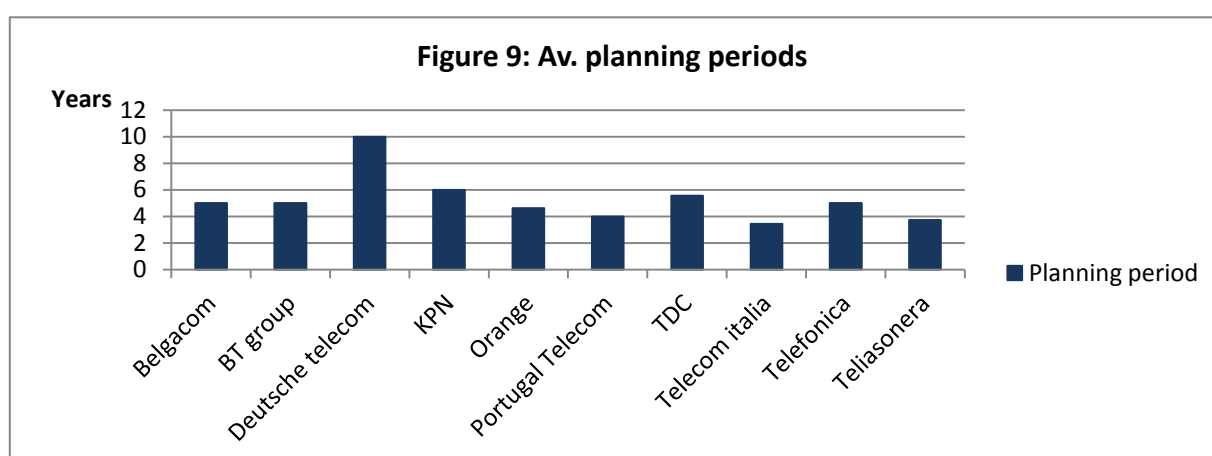


Figure 9 - illustrate the average of planning periods used by the companies over the nine years time horizon.

Only Deutsche Telekom uses a 10 years planning period, justified as better reflecting the assumptions for short to mid-term market developments, and representing a steady states, useful in the computation of the TV, due to long investments cycles in the telecommunication industry and the investments planned and expected in the long run to acquire and extent the rights of spectrum use [Deutsche Telekom, 2013]. It is worth wondering whether it is a reasonable justification. Deutsche Telekom used this planning horizon from 2005 until 2013 and consequently one might expect that either regulatory authorities admit it or conversely they do not but, at the same time cannot prove that it is not a proper justification, which is the purpose of the use of discretion by management.

KPN, by contrast, did not disclosed any further information on the fact that they used, especially between 2008 and 2011, a range of planning periods from three up to eight

or ten years, depending on the CGU. Needless to say, this practice does not go along with the requirement of the standards in regard to disclosures.

Denmark telecommunication company TDC also used a ten-years planning period for the years 2005 to 2007 without any explanation about this time duration.

Only Teliasonera is at the top of the class by disclosing CGU specific planning periods. They may use a ten-years forecast period in the case of a start-up CGU or as well as in the situation where put-options have been allowed to the minority interests of the CGU [Teliasonera, 2013].

The financial crisis seems to have an impact on the forecast periods. Indeed, one might expect a lowering time horizon from 2008 onwards in order to be safer and more reliable with respect to the deterioration of the economic background and therefore the uncertainty of cash flows forecast realisation. The planning horizon on average was in 2005 of 5,6 years, slightly decreasing each year to reach 4,8 years in 2013.

3. Determining the recoverable amount

When determining whether an asset or a CGU needs to be impaired, the recoverable amount of that asset or CGU must be determined and compared with its carrying amount to see whether it is lower or equal to it. The recoverable amount is the higher of the Fair Value Less Cost of Disposals (FVLCD) or the Value in Use (VIU). But only one of these two methods mentioned here above is necessary if it confirms that the recoverable amount is precisely below or equal to the carrying amount. Therefore, most of the time and in order to save cost, companies only use one of the two approaches. Almost every company disclose that to compute the recoverable amount, they use the higher of the fair value less cost of disposals and value in use. Nevertheless, as exhibited by figure 10, the majority of the sample uses the VIU method. In addition, the analysis reveals that 9 out of 10 companies in the sample use the discounted cash flow (DCF) method, which is consistent with our statement in the VIU section that the DCF is the commonly used computation method.

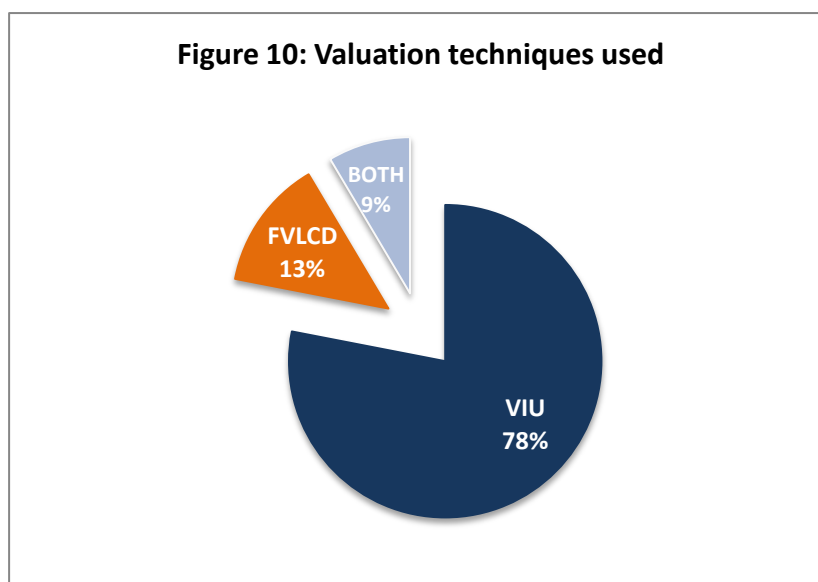


Figure 10 - Representation of the valuation techniques on average used by the sample over the nine years time horizon.

It is necessary to bear in mind that, as mentioned in the section C: impairment test, even if the FVLCD is a possibility of measurement, it doesn't not fit the valuation of an asset like goodwill. Therefore, the results of figure 10 are in line with that assumption. However, after having conducted an in-depth analysis of the entities in the sample, no evidence has been highlighted concerning the use of a technique compared to another.

In a situation where a company might use the FVLCD in some rare case, Deutsche Telecom uses it most of the time, and from 2005 until 2013. They use either the market price of companies to evaluate the recoverable amount of the CGU or by the mean of the DCF method. However, they never disclosed the main reasons for the choice of the FVLCD method rather than the VIU one. They are well aware of the necessity to disclose the fair value hierarchy of the input used in the valuation and disclose, when necessary, the parameters included in the DCF computation just as they would have done via the use of the VIU method. KPN uses both from 2007 to 2010 but once again without real explanations once again.

4. The rates

As previously mentioned, the value attributable to a CGU is based on two phases. here above we discussed about the planning period which concerns the cash flows

projections planned by the management. After the cash flow from the last period - five years as prescribed by IAS 36 - the company needs to evaluate the CGU as it has a perpetual growth over time. That is where the growth rate comes into play. As the two phases are considering value of money over time, the use of a discount factor becomes necessary in order to respect the time value of money. This factor constitutes the discount rate. As the literature as well as our sample suggest it, the discounted cash flow method is the most famous computation method to estimate the VIU even if there exist plenty of other ways to compute it. Besides, the standards do not prescribe the use of one among others.

a. The discount rate

First and foremost let's remind ourselves that IAS 36 requires the use of a pre-tax discount rate with pre-tax cash flows. In reality however, the computation of the pre-tax implies complications, which drive companies to use sometimes, a post-tax rate with post-tax cash flows. Nevertheless, the IAS 36 specifically requires the disclosure of a pre-tax discount rate even if it was obtained through an iterative method [BDO, 2013]. Figure 12 shows that the reality fails to conform with the theory. Indeed 30% of the sample disclosed only post-tax rate.

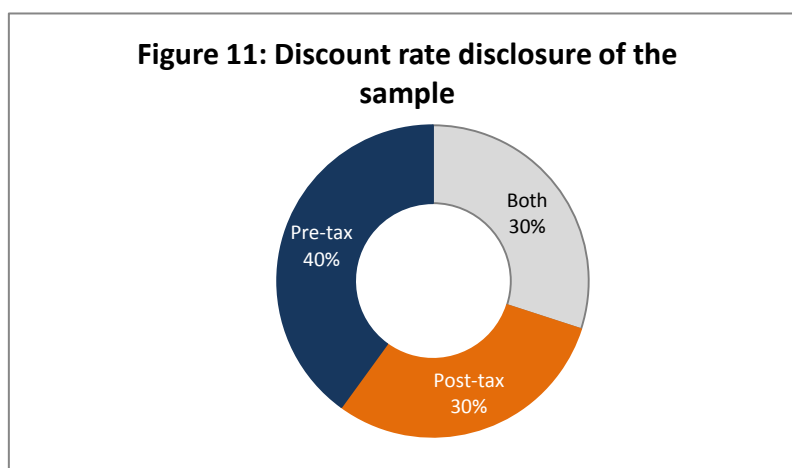


Figure 11 - Illustration of the disclosures on the discount rates made by the entities within the sample of the nine years time horizon.

It is important to bear in mind that the discount rate aims at discounting expected future cash flows to their net present value with reliability to the economic environment. Besides, the more the period is covering long terms assumptions, the more it is difficult to

predict, especially in circumstance of crisis recession [Patel, et al, na]. A small change can have considerable effects on the final valuation and therefore may radically change the necessity for impairment or not. For instance, high discount rates between 9% and 24% assume a prudent approach [Camodeca, et al, 2013]. Furthermore, as the discount rate is most of the time computed with the weighted average cost of capital (WACC), it is mainly composed of two elements, which are the cost of equity and the cost of capital. Both are related to economic assumptions.

The cost of equity on the one hand is driven by uncertainty linked firstly to the risk free rate, which is supposed to represent the market risk. However, the question that arises is whether companies should use a historical risk free rate, which represents past economic outlooks, or a future lower risk free rate to represent future evolution of the market risk. Secondly, the need for additional premium risk return to compensate extra risks is also likely to rise since few company are 100% self-confident about the future of the credit spread (*i.e.* expected loss on contractual cash flows of financial instruments) and the default premium (*i.e.* the compensation for uncertainty in expected future defaults, in timing and amount of future cash flows) [Ernst & Young, 2011].

The cost of debt, on the other hand, for which loan are harder and harder to obtain in time of recession [Patel, et al, na].

Our sample study, based on disclosures of the entities, revealed so far that discount rates are volatile and increasing and that the economic environment is slowing down because of the fear left by the recession. It also revealed that the cost of capital rose.

b. The growth rate

The period coming next to the planning period is approximated by the terminal value in the DCF computation. It represents the perpetuity growth of the valuated asset or CGU in the case of asset with indefinite useful life such as goodwill. The terminal value represents a high proportion of the total present value up to 75% [Rotkowski, et al, 2013]. Therefore, the TV represents the growth expectations in the future from the last cash flow expected to arise following the planning period length, on which a perpetual growth rate is applied. Basically, the g-rate used is supposed to be around the inflation rate. A higher rate could mean that the company expect to improve more strongly than the market and *vice versa*. In

the Camodeca et al' survey, the g-rate was around 3% and 11% and they stipulated that the g-rate is supposed to follow the inflation rate.

So far our study highlighted that the companies of our sample had in some way troubles to estimate reasonably their future cash flows, especially with febrile economical climate. Therefore, if the last cash flow is over estimated and a perpetuity growth rate is applied on it, it could lead to considerable over estimation of an asset or of a CGU.

c. Disclosures

The standard requires a specific disclosure of the discount rate and the growth rate for each CGU in order to better reflect the key assumptions and growth expectations relating to the market, industry or country in which the CGU operates. We should note that we used only rates concerning European countries to stay consistent with our sample. Indeed, some companies disclosed growth rates and discount rates from countries like Brazil which are not facing the same economic environment and thus had for instance largely higher growth rate. Figure 13 provides us with the disclosures of the sample on the discount rates and growth rate they used in 2013. It is worth noting that the disclosures have largely improved since 2009. For the financial years 2005 and 2006 very few of the companies within the sample disclosed their rates.

Generally speaking, disclosures on how they obtained their discount rates and growth rates are very lean. It is especially true for discount rates, where most of the time the companies says they used one technique or another on the basis of available market data. It can certainly be said that there is a gap between the IAS requirements and the practice.

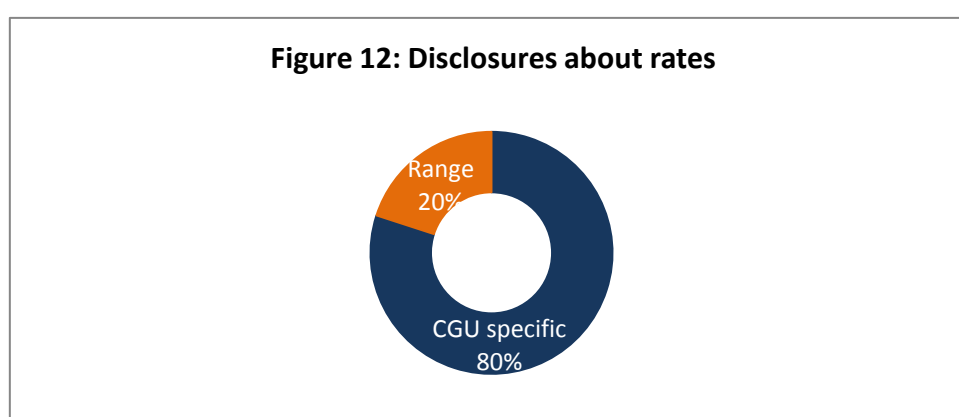


Figure 12 - Percentage of the CGU specific disclosures about rates used by the entities within our sample.

d. Tendencies of the discount rates and the growth rates

Figure 13 exhibits, on the left hand side, the percentage post-tax and pre-tax discount rates disclosed by the entities. These percentages are expressed in average of the sample for each year. In order not to overflow the figure, the median has not been represented on this graph but it has the same shape as the mean. On the right hand side stands the percentage of growth rates disclosed by the entities. As well as for the discount rate, this line represents the mean of the sample over the time horizon. Concerning the median, the same applies for the growth rate. First of all we will focus on the tendencies of this figure which will be followed up by a deeper analysis of the g-rate.

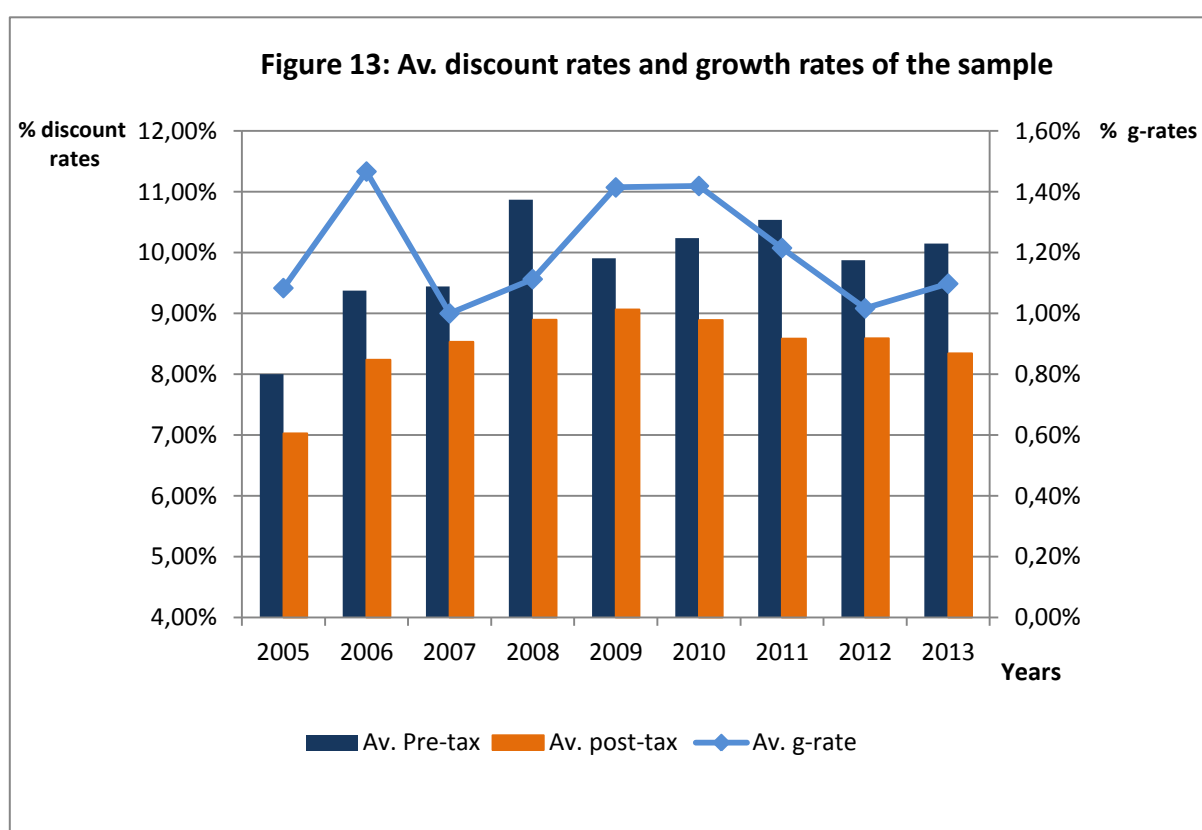


Figure 13 - On the right hand side stands the percentages of growth rates used by the sample expressed as mean (diamond line) of the sample for each year. On the left hand side stands the percentage of pre-tax and post-tax used by the sample for each year.

There are two main elements highlighted by this figure. The first is the tendency of the post-tax discount rate plots to inch up in 2006, to peak in 2009 and then decrease until 2013. The pre-tax discount rate follows the same curve with the difference that the latter

rose up again in 2011. At first glance, it is consistent with our assumptions about discount rates highlighted in the impairment charge and in the financial crisis sections. Six entities from our sample use the WACC method to compute their discount rates. Turning to the others, BT group uses external sources like market data whereas Orange uses WACC and g-rate as well as other external sources from its peers. For their part, Portugal Telecom uses discount rates from current market assessments of the time value of money and TDC uses a risk premium on the risk-free interest rate fixed at a level that reflects management expectations of the spread for future financing. Therefore, it is clear that the financial crisis had an impact on the discount rates used by the telecom industry: they rose in 2008, we can deduce from it prudence over the projections made by the management. The ESMA study of 2013 reports the use of discount rates between 8% and 11% (7% and 10% post-tax) in its sample. Our sample is perfectly consistent with this assumption.

Secondly, the growth rate line which decreased in 2007 slightly increased in 2008 to reach a peak in 2009. The average growth rate of the telecom industry represented by our sample is bounded between 1% and 1,6%, meaning that the rate stays more or less steady over time and reflects a very precautionary approach about growth expectations, if we refer to the fact that Camodeca et al stipulated about the level of growth rate being near the inflation.

As a matter of conclusion, by comparing this figure 13 with figure 6 about impairment charges to goodwill ratio, we can find evidences of a correlation between them. Indeed, in 2008 the impairment to goodwill ratio rose, meaning that the proportion of impairment compared to goodwill was higher. Moreover, there was an additional impairment compared to the adjacent years. In 2008 and 2009 the discount factors surged, thus increasing the chance for an impairment. Furthermore, the growth rate, even if increasing, stays low, which is also in favour of an impairment. In 2010 the impairment ratio dropped close to zero, whereas the discount factor, especially the pre-tax, is low. The g-rate for its part is at its highest level since 2006, meaning that with regards to 2010 the figures are also consistent. In 2011 the impairment ratio skyrocket while the pre-tax rates went also up. Yet when the discount rate increases, one could expect the chance of occurrence of impairment charges to increase, as the discount factor is used as denominator, which increases proportionally with years, diminishing the recoverable amount. Moreover, a

smaller growth rate ratio also contributes to increase the chance of impairment. Therefore, we are entitled to wonder whether the key assumptions used in the determination of the recoverable amount through the use of the VIU are prone to management manipulations or not. Sometimes intuitions are contradictory, it is therefore hard to isolate what factor dominates the other. Indeed, it is possible for the discount factor to increase while the g-rate increases as it is the case in 2013. Despite of this, the impairment charges to goodwill ratio for that year, even if lower than in 2012, is still significant.

e. In depth analysis of the growth rate

This study deepens the researches on the growth rate topic in particular because while discount rates are internally computed, the g-rate is more related to the economy of the industry or of the country in which the entity and its CGU operates and is thus easier to analyse. For this purpose we will compare the minimal, the maximal and the mean growth rates of our sample to the European inflation rate recorded on the same time horizon by the European Central Bank [ECB, 2015].

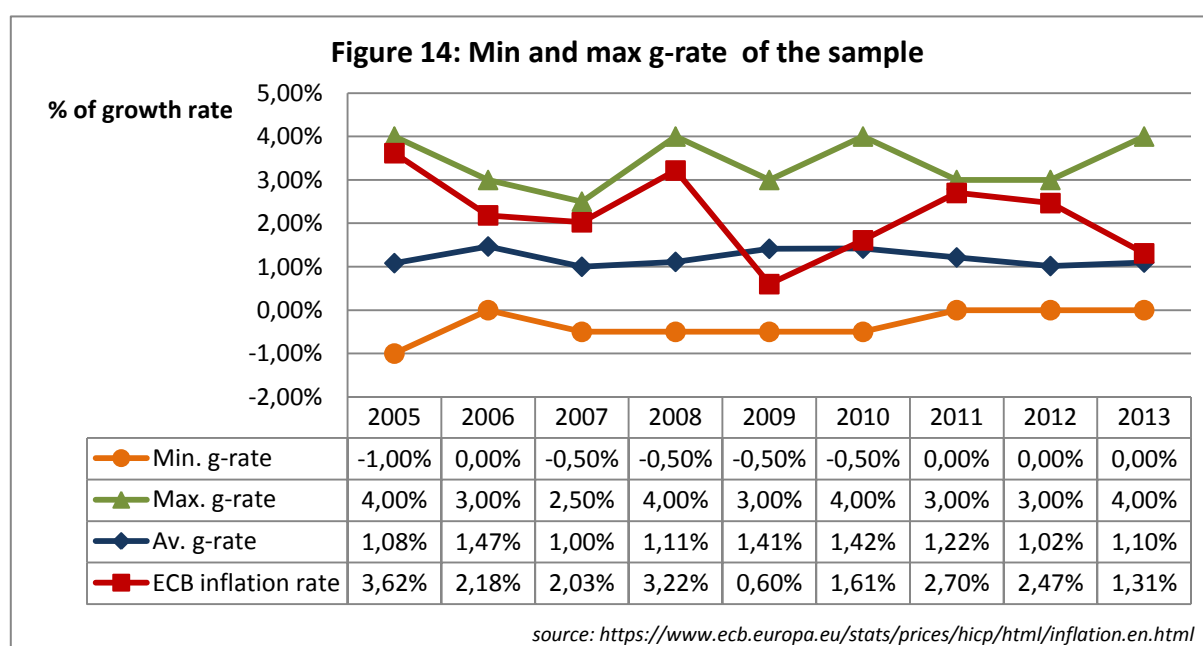


Figure 14 - Illustration of the percentages of minimum (dot line), maximum (triangle line) and average growth rates (diamond line) of the sample from 2005 to 2013. Compared to the European inflation rate (square line - from ECB) over the same time horizon.

According to figure 14 it clearly appears that the growth rates are consistent with the inflation rates. The later boarded between the min and the max of the sample but nearly always slightly over the means. Note that the median is not represented here because of the fact that it is a almost perfect match with the average. Indeed, the average is not biased by any outstanding g-rate since all the rates disclosed by the entities throughout the timeline are from the same shape. Therefore it is no exaggeration to say that on average the sample had a prudent approach in assessing their growth opportunities. Even when one could expect any great maximum rate during one year or another, this was not achieved. We can even say that the max rates are slightly higher than the European inflation rate. Moreover, from October 2009 to June 2009, the ECB recorded deflation rates of around -0,3% where in our sample only Telecom Italia used a negative growth rate on its terminal value.

Companies that used a g-rate greater than the inflation rate are supposed to have motivations about the reason why they are expecting any CGU to outperform the market. For instance for nearly each company, their g-rate exceeded the inflation rate in 2009 which was 0,60%. For instance, BT group explained for that year that they chose their g-rate accordingly to the long term historical growth rates of the regions in which the CGU operates and they reflected an assessment of long term growth prospects of the sector (*i.e.* 1,6% and 2%). Afterwards, they added that it has been benchmarked against external data and that none of them exceeded the historical average growth rate for those market and sectors [BT group, 2009]. Deutsche Telecom that disclosed discount rates for eastern Europe between 1,3% and 2,3% without any information about the reasons for such variation. Nevertheless, they said that a change of only 0,5% would have led to an increase in impairment of about 300 million euros [Deutsche Telecom, 2009]. TDC used mainly 2,5% for its CGU but did not add additional information [TDC, 2009]. An important issue regarding the year 2009 is that nearly all the disclosed g-rates from nearly every companies exceeded the inflation rate. An explanation could be a lag with respect to the market as it concerns the year just after the crisis blast off.

As stipulated by the ESMA study in 2013, a growth rate higher than 3% is too optimistic compared to the long term investors expectations on the market capitalisation especially in the current recession [ESMA, 2013]. Moreover, IAS 36 requires the use of a steady or declining growth rate unless an increasing rate can be justified [IAS36, 33c]. In

comparison, our sample is on average largely below the level of 3%. Only maximums are sometimes higher. We can also state that companies do not follow at all the requirement of the standard concerning the steady or declining rate.

5. Sensitivity analysis

Most of the time, the entities (5 out of 10) disclose a sensitivity analysis which consist in a extrapolation of the inputs used in the computation of the DCF that are supposed to represent reasonable change in key assumptions. They subsequently state whether or not the variation leads or not to the recoverable amount becoming higher than the carrying amount. BT group and Telecom Italia do it in a slightly different way. Indeed, they start with the recoverable amount being at least equal to the carrying amount then, they compute the rates that would conduct to that equality. It allows them to know what would be the maximum discount rate and growth rate from which the impairment would be necessary. On the contrary, TDC discloses really few information about their sensitivity analysis: the group only states that "the any reasonable changes in the key assumptions are deemed no to cause the carrying amount of goodwill to exceed the recoverable amount" [TDC, 2013]. The rest of the sample (3 out of 10) does not disclose relevant information on the sensitivity analysis, let's remind ourselves that Deutsche Telecom use the FVLCD method, and thus disclose their rates, the way they obtained the cash flows expectations. Nevertheless, their disclosures stay quite low: this method is less comprehensive in terms of disclosures than the VIU. We should remember that the IAS 36 *impairment of assets requires* explicitly the company to disclose the sensitivity analysis on reasonably possible change in key assumptions while IFRS 13 *Fair value measurement* does not: it calls for the entity to provide quantitative information about the significant unobservable inputs; to disclose, when using the FVLCD with unobservable inputs (*i.e.* the income approach), the effect of the measurements on the profit and loss or other comprehensive income for the period, and if any change in valuation technique appears, the entity shall disclose those changes [IFRS13, 91-93]. Therefore, five companies are consistent with this requirement, two do even better, and two are below expectations and Deutsche Telecom meets the IFRS 13's requirement.

As the enforcers stipulate in their reports, it appears that the disclosures on the impairment test as well as the sensitivity analysis are low, and not especially understandable

with regard to the sensitivity analysis in itself. But most of all, what remains is the sensation that only measured and selected information are disclosed, in order to suit the theoretical requirement, with the purpose of compliance with the standards rather than the faithful information at its source.

As a matter of conclusion about the goodwill part we have analysed the goodwill position and the variation of goodwill over the years. Afterwards, we have studied the impairment losses recognised by our segment, we assumed that these two figures are correlated. This has led to the examination of the different key assumptions in the goodwill impairment testing of our sample, with among other things the CGU allocation, the planning periods, the discount and the growth rates. This section mainly underlined that the elements composing the computations are in general consistent with the economic environment, and that the financial crisis had an impact on the goodwill valuation but also has worsened the future expectations of the managements. It has also highlighted that the disclosures are under IASB's expectations or the assumptions from other enforcement authorities.

II. Does the impairment of goodwill better reflect its economic useful life?

In the light of the above topic on impairment, one good question remains: does the impairment of goodwill better reflect its economic useful life? What are the other feasible methods. And what is our path of reflection.

A. Intuitions resulting from the analysis of the impairment method

The purpose of the impairment only approach is for assets with an indefinite useful life to get as close as possible to the reality of the salvage value of that asset. We already know that the goodwill is difficult to account as an asset, especially when we know that it does not even exist by its own because it is the result of an entity acquired by another one. Beyond this consideration, it is even harder to attribute a definite useful life to it and its completely arbitrariness. Therefore, IASB and US GAAP decided to adopt the impairment method of asset with definite useful life. This regime is supposed to determine the future value of that kind asset in the subsequent periods at the present time. The evaluation focuses on the movement of the asset, which could either rise or fall in the future. This assessment has to be carried out at least once a year. As far as that goes it looks nice on paper. But, as we highlighted previously, there are several elements that may be problematic.

First of all, the non reversibility of the impairment charges. As goodwill represents an important part of the annual report, investors carefully focus on it [Keryn et al, 2011]. Because of that term, managers have their backs to the wall and might be tempted to avoid impairment as far as possible by the use of discretion.

Secondly, the difficulty for SME to compute the key assumptions required in a VIU valuation represents a waste of time and money. On the contrary, a straight line basis amortisation is far easier.

The third and final point is linked to the first one as it concerns discretion. Indeed, and despite the requirements made by the IASB, the companies seem to adapt their disclosures at their own convenience, it allows them to control their impairment test. It is especially underlined by the sensitivity analysis: some companies compute the maximum

rates after which the impairment loss would become unavoidable. Thereafter, they only have to choose their rates below those calculated before and disclose the reason why they chose them. This clearly demonstrates the room for discretion left to the entities. Furthermore, as Trottier explains by means of the agency theory, the management will always tend to maximise its utility, and will thus use impairment charges as it best suits them. The impairment only approach then loses all sense of economic useful life time valuation, especially from an investors point of view, when it allows tremendous accounting manipulation from the management's angle. We will not pretend to advocate one method over another, but if the impairment method is fair at the inception, its use is, from a fair value perspective, potentially less reliable since it is used in a purpose of finance optimisation rather than what it has primarily been designed for. This is the so-called difference between the *jure* and the *de facto* harmonisation [Tommaso et al, 2014].

B. What else?

A significant counter-argument of the impairment only approach is the ephemeral character of the acquired goodwill. Indeed, and even if it is playing with words, it is commonly stipulated that goodwill, is from an acquired nature, at the acquisition date (after the acquisition of the company) There are not two companies anymore but one and only one company, and thus, the acquired goodwill at its core is consumed and replaced by internally generated goodwill, recognition of which is prohibited. Therefore, some argue that the direct write-off to profit and loss or to equity method best suits the real being of a goodwill [Tommaso et al, 2014].

The direct write-off to profit and loss supporters argue that the goodwill does not meet the definition of an asset and must therefore be considered as a cost or if it occurs as a profit. The direct write-off to equity on the contrary does not impact the profit and loss, but this is possibly the most controversial proposition of goodwill accounting as in this case the goodwill will not be accounted as an asset anymore. There also exists a proposition of a mix between the former and the current method, which is the amortisation and impairment approach, but it amounts to stick plasters on a wooden leg as it does not give answers to the latent issues (*i.e.* the determination of useful life, the room of discretion,...) [Tommaso et al, 2014].

A line of thought could consist in imposing key assumptions. First and foremost, the value in use and the DCF through the use of the WACC could be demanded, in order to standardise the method as well as the inherent disclosures. Afterwards, depending on the country or the industry in which the entity operates and at a given time, the rates necessary to the computation could be required by the market (*i.e.* $g\text{-rate} = \text{inflation rate of the country in } t-1$, the discount rates could be led by the $\text{LIBOR} + x \text{ bps}$), so that it sticks to a common reality and reduces the room for discretion. In our point of view, this method would come closest to what the goodwill actually is, or would at least be better than the old amortisation method, with the advantage to thwarting the management's discretion power.

In order to conclude this chapter, it is worth saying that the goodwill for nowadays represents a huge cloud of confusion. Authorities are not even sure of whether it meets the definition of an asset, and if yes, how it should be treated. On the one hand it is hard to estimate its economic useful life and on the other hand, in the impairment only approach, management has too much room for discretion, which skews the aim of fair value representation.

Conclusion

This topic has made a lot of ink flow because of its complexity. This intricacy is mainly due to the uniqueness of the goodwill. But in accountancy just as in science, nothing is created, nothing is lost, everything is transformed, therefore goodwill must be taken into account, there comes the question of its treatment, which is at the heart of the debate.

Based on a thorough analysis, it is obvious that the financial turmoil has impacted the goodwill position of the companies within our sample, both directly and indirectly. Indeed, the goodwill valuation is based on several key assumptions. To begin with, it is supposed to be indefinite in terms of time horizon, and therefore a perpetuity growth rate has to be applied on it. Besides, it has no contractual terms neither in time nor in incomes. But in finance one way *inter alia* to value an asset refer to its ability to generate future expected cash inflows, on which a discount factor is applied in order to represent the time value of money. This paragraph summarises the main assumptions impacted by the crisis.

First, the companies have to determine a planning horizon for their CGU to which goodwill has been allocated, limited by the IAS 36 to five years, unless a proper motivation can be put forwards.

This five-year period is due to several factors. On the one hand, it would be hard to reliably estimate what are the expected returns of an asset that has no income securities over a longer time period. We could notice that the time horizons of the entities constituting our sample tends to slightly fall down over the years, which may reflect a more cautious approach.

On the other hand, after the planning horizon, the companies need to determinate the cash flows they expect to arise. Therefore, the companies have to base their believes upon empirical results and the most recent budget. It is easily understandable that if the budget is forecasted on the basis of the results of preceding years, the crisis in 2008 forced the expectations based on 2007 to be over-estimated, which has led to unfavourable regulatory decisions with regard to future incomes. But there is more to find out: the financial crisis has not only had a direct impact on the subsequent year, it has also left a fear of recession, making the future climate unpredictable, and lowering the feasibility of the predictions. Moreover, it has led to an increase in the volatility of the market participants and their expectations about future earnings, causing a rise in the cost of capital.

Secondly, as introduced in the previous paragraph, the cost of capital (*i.e.* the WACC - the discount rate) has fluctuated over the years. On the one hand, the pre-tax discount rate, as required by IAS 36, started in 2005 at 8%, skyrocketed in 2008, reached up to 11% before falling down a bit in 2009, to rose again in 2011 and end at a little more than 10% in 2013. On its part, the post-tax rate was coming from 7% in 2005 and reached its peak in 2009. It then slightly fell down over the years. A high discount rate mathematically means a lower recoverable amount, increasing the probability of depreciation occurrence. This was verified afterwards with the highest proportion of impairment losses recorded in 2008, 2011 (specifically that year), and subsequent years. Only 2010 is the year that has a really low proportion of depreciation, but it is also the year with the highest level of goodwill position in our sample, leading the ratio of impairment charge to goodwill to be at its lowest level on the time horizon.

Thirdly, as the goodwill is an asset with an indefinite useful life, the predictions beyond the planning period must be considered as *ad infinitum*. Therefore, a perpetuity growth rate is applied on the latest predicted cash flow forecast. This is the so-called terminal value which is approximated by means of the Gordon growth model. The standard requires the growth rate to be steady or declining unless an increasing rate can be justified. This rate is also supposed to reflect the specific inflation rate according to its country or industry; a higher rate would mean that the company expects to over-perform the general economy in which it operates. the higher the percentage of growth rate, the higher the recoverable amount. It turns out that our sample used prudent growth rate, being below the European inflation rate, even if the companies of our sample do not meet the standard's requirement. It is hard to determine whether the crisis in itself had an impact on the determination of the growth rate, but its sure that they are consistent with a depression period.

Finally, the crisis had an impact yes, but, as in a board game or as in tax, when the rules change, the player adapt. Indeed we could highlight decreasing position of goodwill and improving impairment charges, but that can possibly be the minimum level at which impairment couldn't be avoided. What is certain is that the management disposes of an important room for discretion, and probably the main limit to this study was that we could have based our research only upon what the management agreed to disclose. Sometimes

however, a slight variation of 0,1% in any of the rates might lead to a dramatic change in the recoverable amount. Feasible future research could be for instance, an in-depth analysis from case to case assuming that the analysed company is agreed to deliver all its secrets. Or it could also be the establishment of a grid of disclosures in order to fix the information provided, with an emphasis on the how companies did their computations.

This master thesis subject was very entertaining because, on the one hand, it focuses on theoretical basis with very substantive reports on the subject - with the standards IAS 36, IFRS 3 and IFRS 13 - as well as with all the writings thereupon, and all the enforcers that provide their own explanations and their "how to". On the other hand, after having brought the light to that issue, it was more than captivating to analyse and discover what is done *de facto* by companies. Moreover, as accountancy is known for being logical and "square" with the goodwill, it seems that we reached the limits of the logic since it is necessary to put an amount on something that has neither price nor definite useful life.

Bibliography

Annual reports

Belgacom SA. (2005-2013). *Belgacom. Annual reports*. Bruxelles, BE:.

BT Group PLC. (2005-2013). *BT Group PLC. Annual reports & Form 20-F2005-2013*. London, UK:.

Deutsche Telecom AG. (2005-2013). *Deutsche Telecom AG. Annual reports*. Bonn, DE:.

KPN N.V. (2005-2013). *KPN N.V. Annual reports*. Den Haag, NL:.

Orange SA. (2005-2013). *Orange SA. Annual reports*. Paris. FR:.

Portugal Telecom SGPS,SA. (2005-2013). *Portugal Telecom SGPS, SA. Annual reports*. Lisboa, PT:.

TDC A/S. (2005-2013). *TDC A/S. Annual reports*. Copenhagen, DK:.

Telecom Italia. (2005-2013). *Telecom Italia. Annual reports*. Milan, IT:.

Telefonica SA. (2005-2013). *Telefonica SA. Annual reports*. Madrid, ES:.

TeliaSonera AB. (2005-2013) *TeliaSonera AB. Annual reports*. Stockholm, SE:.

Standards

International Accounting Standards Board [IASB]. (2013). *International Accounting Standard 36: Impairment of assets*. Retrieved from <http://www.ifrs.org/IFRSs/Pages/IFRS.aspx>

International Accounting Standards Board [IASB]. (2011). *International Financial Reporting Standard 13: Fair value measurement*. Retrieved from <http://www.ifrs.org/IFRSs/Pages/IFRS.aspx>

International Accounting Standards Board [IASB]. (2001). *International Financial Reporting*

Standard 3: Business combinations. Retrieved from <http://www.ifrs.org/IFRSs/Pages/IFRS.aspx>

International Accounting Standards Board [IASB]. (2013). *International Accounting Standard 38: Intangible assets.* Retrieved from <http://www.ifrs.org/IFRSs/Pages/IFRS.aspx>

International Accounting Standards Board [IASB]. (2013). *International Financial reporting Standard 8: Operating segment.* Retrieved from <http://www.ifrs.org/IFRSs/Pages/IFRS.aspx>

Litterature

AbuGhazaleh, M., Al-Hares, M. and Roberts, C. (2011). Accounting discretion in goodwill impairments: UK evidence, *Journal of International Financial Management & Accounting*, 22(3), 164-204. doi: 10.1111/j.1467-646X.2011.01049.x

BDO. (2013). *IFRS in practice: IAS 36 impairment of assets* (2013). Retrieved from [http://www.bdointernational.com/Services/Audit/IFRS/IFRS%20in%20Practice/Documents/IFRS%20in%20Practice%20-%20IAS%2036%20Impairment%20of%20Assets%20\(print\).pdf](http://www.bdointernational.com/Services/Audit/IFRS/IFRS%20in%20Practice/Documents/IFRS%20in%20Practice%20-%20IAS%2036%20Impairment%20of%20Assets%20(print).pdf)

Camodeca, R., Almici, A. and Bernardi, M. (2013). Goodwill impairment testing under IFRS before and after the financial crisis: evidence from the UK large listed companies. *Problems and perspectives in Management*, 11(3), 17-23.

Chalmers, K., Godfrey, J. and Webster, J. (2011). Does a goodwill impairment regime better reflect the underlying economic attributes of goodwill ? *Accounting and finance*, 51(1), 634-660.

Association des Experts en Evaluation d'Entreprises de Lyon (2013). *Modalités de réalisation des tests de dépréciation du goodwill dans les sociétés du SBF 120 de 2010 à 2012.* 1-34. Retrieved from http://www.a3e-lyon.fr/img/pdf/etudea3e_sbf120-2011_presentation_23mai2013.pdf

Duff&Phelps. (2014). *2014 European goodwill impairment study*. Retrieved from <http://www.duffandphelps.com/expertise/publications/Pages/NewslettersDetail.aspx?itemid=176&list=Newsletters>

Dobbs, R., Jiang, B. and Koller, T.M. (2008). Why the crisis hasn't shaken the cost of capital: The cost of capital hasn't increased so far in the downturn—and didn't in past recessions. *McKinsey Quarterly*, 1-6.

Dunse, N.A. and Hutchison, N.E. (2004). Trade-related valuations and the treatment of goodwill. *Journal of Property Investment & Finance*, 22(3), 236-258.

Ernst & Young. (2011). *Discount rates: One size does not fit all*. Retrieved from [http://www.ey.com/Publication/vwLUAssets/insights/\\$FILE/insight_disconrates.pdf](http://www.ey.com/Publication/vwLUAssets/insights/$FILE/insight_disconrates.pdf)

ESMA. (2013). *ESMA report: European enforcers review of impairment of goodwill and other intangible assets in the IFRS financial statements* (Rapport n° 2013/2). Paris.

ESMA. (2013). *IFRS enforcement in Europe: Report impairment of non-financial asset* (Report n° 254). Retrieved from http://www.ima-france.com/load_conference/IMA.20130227_ESMA-IFRS-depreciation.pdf

EFRAG. (2014). *Should goodwill still not be amortised? Accounting and disclosure for goodwill*. Retrieved from http://www.efrag.org/files/Goodwill%20Impairment%20and%20Amortisation/140725_Should_goodwill_still_not_be_amortised_Research_Group_paper.pdf

Forest, L., Parent, P. and Velut, C. (2014). Test de dépréciation des goodwills: enjeux, pratiques et recommandations. *RFComptable*, 414, 18-21.

FSMA. (2012). *Etudes concernant la publication d'informations sur le goodwill conformément à la norme IAS 36 dans les comptes annuels des sociétés cotées portant sur l'exercice 2010*. (Publication n° 41). Retrieved from https://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCIQFjAAahUKEwiquWnq_3GAhWCuBQKHW8IDQc&url=http%3

A%2F%2Fwww.fsma.be%2F~%2Fmedia%2FFiles%2Ffsmafiles%2Fstudies%2Ffr%2Fstudy41.ashx&ei=xTO3Veq7IoLxUu-QtDg&usg=AFQjCNFNXC_dcqIEvsN-5FPLjDTA8xX2zQ&bvm=bv.98717601,d.bGQ&cad=rja

FSMA. (2012). *Goodwill. Etude de la FSMA: publication d'informations sur le goodwill conformément à la norme IAS 36 dans les comptes annuels des sociétés cotées portant sur l'exercice 2010*. Retrieved from [https://www.ibr-ire.be/nl/vorming_events/agenda/infosessies/Documents/5\)%20slides%20IAS%2036V2.pdf](https://www.ibr-ire.be/nl/vorming_events/agenda/infosessies/Documents/5)%20slides%20IAS%2036V2.pdf)

Grant Thornton. (2014). *Impairment of assets: A guide to applying IAS 36 in practice*. Retrieved from http://grantthornton.ca/resources/insights/adviser_alerts/IAS%2036%20Impairment%20of%20Assets%20-%20A%20guide%20to%20applying%20IAS%2036%20in%20practice.pdf

Herz, R., Iannacconi, T., Maines, L., Palepu, K., Ryan, S., Schipper, K., ... Schrand, C. (2001). Equity valuation models and measuring goodwill impairment, *American Accounting Association Accounting Horizons*, 15(2), 161-170.

Kantor, J. and Pike, R. (1987). Valuing Unlisted shares: A dual approach to the major information determinants. *Managerial and Decision Economics (1986 -1998)*, 8(3), 221-228.

KPMG. (2011). *Evaluating impairment risk: Goodwill impairment continues its downward trend in 2009*.

Mautino, L. (2013). Advancing economics in business : What WACC for the crisis? *Oxera Agenda*, 1-6.

Laghi, E., Mattei, M. and di Marcantonio, M. (2013). Assessing the value relevance of goodwill impairment considering country-specific factors: Evidence from EU listed companies. *International Journal of Economics and Finance*, 5(7). 32-50. doi: 10.5539/ijef.v5n7p32

Patel, V. and Venneri, M. (na). Cost of capital in the financial turmoil: how should utilities deal with it ? *Value partners*, 1-5.

PWC. (2009). *Making acquisitions transparent: Goodwill accounting in times of crisis*. Retrieved from http://pwcmaroc.pwc.fr/assets/files/pdf/pwcma_41098_studie_goodwill_france_110225_screen.pdf

PWC. (na). *Making sense of a complex world: IAS 36 impairment of assets, a discussion paper on the impact on the telecoms industry*. Retrieved from <http://www.pwc.com/gx/en/communications/publications/ias-36-impairment-of-assets.jhtml>

Qasim, A., Haddad, A.E. and AbuGhazaleh, N. (2013). Goodwill accounting in the united kingdom: The effect of international financial reporting standards. *Review of Business and finance studies*, 4(1), 63-78.

Rotkowski, A. and Clough, E. (2013). How to estimate the long term growth rate in the discounted cash flow method, *Forensic Analysis Insights - Business Valuatuo*, 9-20.

Seetharaman, A., Sreenivasan, J., Sudha, R. and Ya Yee, T. (2005). Managing impairment of goodwill, *Journal of intellectual Capital*, 7(3), 338-353. doi: 10.1108/14691930610681447

Stahlberg, M. (2013). *The impact of the Economic Crisis on Goodwill Impairment Charges, an analysis of the telecommunication industry in Europe*. Berlin, Germany: Berlin School of Economics and Law.

Steenkamp, N. and Kashyap, V. (2010). Importance and contribution of intangible assets: SME managers' perceptions. *Journal of Intellectual Capital*, 11(3), 368-390. doi: 10.1108/14691931011064590.

Stempniewsky, Y. (2015). Les extraits de la base de données de l'EECS: une source de doctrine particulièrement autorisée, pour l'application appropriée et cohérente des normes IFRS! *ACE comptabilité, fiscalité, audit, droit des affaires au Luxembourg*, 2, 8-17.

Trottier, K. (2013). The effect of reversibility on a manager's decision to record asset impairments, *Simon Fraser University*, 12(1), 1-22. doi: 10.1111/1911-3838.12005.

Watson, R. (2010). Small and medium size enterprises and the knowledge economy, assessing the relevance of intangible asset valuation, reporting and management initiatives. *Journal of Financial Regulation and compliance*, 18(2), 131-143. doi: 10.1108/13581981011033998.

Wolfgang, S. and Weiler, A. (2010). Goodwill accounting and performance measurement. *Managerial Finance*, 36 (9), 768-784. doi: 10.1108/03074351011064645.

Internet sources

Deloitte. (2004). IASB issues three new and three revised standards. Retrieved from <http://www.iasplus.com/en/news/2004/March/news1518>

Deloitte. (na). IAS 36 - Impairment of assets. Retrieved from <http://www.iasplus.com/en/standards/ias/ias36>

Deloitte. (na). IFRS 3 - Business combinations. Retrieved from <http://www.iasplus.com/en/standards/ifrs/ifrs3>

Deloitte. (na). IFRS 8 - Operating segments. Retrieved from <http://www.iasplus.com/en/standards/ifrs/ifrs8>

Deloitte. (na). IFRS 13 - Fair value measurement. Retrieved from <http://www.iasplus.com/en/standards/ifrs/ifrs13>

ECB. (2015). Euro foreign exchange reference rates. Retrieved from <https://www.ecb.europa.eu/stats/exchange/eurofxref/html/index.en.html>

ECB. (2015). Inflation dashboard. Retrieved from <https://www.ecb.europa.eu/stats/prices/hicp/html/inflation.en.html>

Ernst&Young. (na). Goodwill: Valuation drivers in the telecommunications industry. Retrieved from <http://www.ey.com/GL/en/Industries/Telecommunications/Valuation-drivers-in-the-telecommunications-industry---Goodwill>

KPMG. (2013). Regulators to focus on goodwill impairment testing: Call for better disclosures. Retrieved from <http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/In-the-Headlines/Documents/ITH-2013-01.pdf>

Le blog du directeur financier. (2013). Le manque de dépréciation du goodwill: étude sur la situation des grands groupes européens. Retrieved from <http://fr.viadeo.com/fr/groups/detaildiscussion/?containerId=0021n5fvup6bglog&forumId=002xsu84033eu98&action=messageDetail&messageId=0021fts0qondsaxo>

Macabacus. (na). Terminal value. Retrieved from <https://www.macabacus.com/valuation/dcf/terminal-value>

Mohutova, S. (na). IAS 36 Impairment of assets. Retrieved from <http://www.ifrsbox.com/ias-36-impairment-assets/>

Mohutova, S. (na). IFRS 3 Business combinations. Retrieved from <http://www.ifrsbox.com/ifrs-3-business-combinations/>

Mohutova, S. (na). IFRS 13 Fair value measurement. Retrieved from <http://www.ifrsbox.com/ifrs-13-fair-value-measurement/>

Liste des opérateurs de télécommunications. (na). Dans *Wikipedia, l'encyclopédie libre*. Retrieved from https://fr.wikipedia.org/wiki/Liste_des_op%C3%A9rateurs_de_t%C3%A9l%C3%A9communications

IFRS Foundation. (na). Conceptual framework. Retrieved from <http://www.ifrs.org/Current-Projects/IASB-Projects/Conceptual-Framework/Pages/Conceptual-Framework-Summary.aspx>

PWC. (2008). Top 10 tips for impairment testing. Retrieved from <https://www.pwc.com/gx/en/ifrs-reporting/pdf/impairment-10tips.pdf>

Sherise, A. (2013). 4 Business valuation methods. Retrieved from <https://blog.udemy.com/business-valuation-method>

Appendices

Appendix 1 - Goodwill position

EUR Million	Goodwill Position	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium	Belgacom	0	1.760	1.777	2.111	2.088	2.337	2.323	2.339	2.320
UK	BT group	689	809	1.117	1.112	1.677	1.665	1.623	1.641	1.749
Deutscheland	Deutsche telecom	18.735	20.955	20.640	20.626	20.334	20.521	17.158	14.440	14.562
Netherlands	KPN	4.571	4.569	5.781	5.659	5.769	5.733	5.575	5.157	1.169
France	Orange	33.726	31.517	31.389	29.914	29.314	29.033	27.340	25.773	24.988
Portugal	Portugal Telecom	1.526	1.284	1.074	942	1.162	416	353	426	380
Denmark	TDC	3.825	3.721	3.147	2.820	3.376	2.143	2.182	2.177	2.173
Italia	Telecom italia	43.980	43.739	44.420	43.230	43.627	43.923	36.957	32.410	29.932
Spain	Telefonica	8.910	21.739	19.770	18.323	19.566	29.582	29.107	27.963	23.434
Sweden	Teliasonera	6.657	6.929	7.538	7.690	8.363	8.566	8.608	8.059	7.539
	Total goodwill of the sample	122.618	137.021	136.653	132.427	135.276	143.919	131.226	120.384	108.246
	Average of the sample	12.262	13.702	13.665	13.243	13.528	14.392	13.123	12.038	10.825
	Median of the sample	5.614	5.749	6.660	6.674	7.066	7.149	7.092	6.608	4.930
	MIN	0	809	1.074	942	1.162	416	353	426	380
	MAX	43.980	43.739	44.420	43.230	43.627	43.923	36.957	32.410	29.932

Appendix 2 - Goodwill variation

% of variation	2006	2007	2008	2009	2010	2011	2012	2013
Belgacom	ns	0,00965909	0,18795723	-0,01089531	0,11925287	-0,00599059	0,00688765	-0,00812313
BT group	0,174066093	0,38117403	-0,00444365	0,5080428	-0,00696893	-0,02516974	0,01079627	0,06582341
Deutsche telecom	0,118494796	-0,01503221	-0,00067829	-0,01415689	0,00919642	-0,1638809	-0,15841007	0,00844875
KPN	-0,00043754	0,26526592	-0,02110362	0,01943806	-0,00624025	-0,02755974	-0,07497758	-0,77331782
Orange	-0,06549843	-0,0040613	-0,04699098	-0,0200575	-0,00958586	-0,05831295	-0,05731529	-0,03045823
Portugal Telecom	-0,15858453	-0,1635514	-0,12290503	0,23354565	-0,64199656	-0,15144231	0,20679887	-0,10798122
TDC	-0,02706534	-0,15416807	-0,10391427	0,19714994	-0,36524218	0,01803612	-0,0023634	-0,00150731
Telecom italia	-0,00547976	0,01556963	-0,02678973	0,00918344	0,00678479	-0,15859572	-0,12303488	-0,07645788
Telefonica	1,439842873	-0,09057454	-0,0731917	0,06783824	0,51190841	-0,01605706	-0,03930326	-0,16196402
Teliasonera	0,040831259	0,08797255	0,02011985	0,08752767	0,02426696	0,00494238	-0,0638078	-0,06448417
Average variation of the sample	16,85%	3,32%	-1,92%	10,78%	-3,59%	-5,84%	-2,95%	-11,50%
MIN variation	-15,86%	-16,36%	-12,29%	-2,01%	-64,20%	-16,39%	-15,84%	-77,33%
MAX variation	143,98%	38,12%	18,80%	50,80%	51,19%	1,80%	20,68%	6,58%
MED variation	2,02%	0,97%	-2,11%	6,78%	-0,62%	-2,76%	-3,93%	-6,45%

Appendix 3 - Goodwill over total assets

	GW/total asset ratio	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium	Belgacom	0,00%	24,11%	24,26%	27,13%	28,03%	27,46%	27,95%	28,38%	27,56%
UK	BT group	1,75%	2,20%	3,39%	3,71%	5,09%	4,99%	5,76%	5,59%	6,11%
Deutscheland	Deutsche telecom	14,58%	16,09%	17,10%	16,76%	15,91%	16,06%	14,01%	13,38%	12,33%
Netherlands	KPN	20,13%	21,49%	23,31%	23,66%	23,21%	25,21%	24,90%	23,12%	4,52%
France	Orange	30,84%	30,71%	31,20%	31,94%	32,25%	30,80%	28,45%	28,64%	29,11%
Portugal	Portugal Telecom	9,17%	9,06%	8,18%	6,87%	7,83%	2,74%	1,54%	3,32%	3,16%
Denmark	TDC	31,22%	35,12%	22,12%	21,01%	29,08%	24,65%	24,89%	25,57%	26,84%
Italia	Telecom italia	45,58%	48,43%	50,14%	50,14%	50,62%	49,31%	44,03%	41,77%	42,63%
Spain	Telefonica	12,18%	19,95%	18,67%	18,34%	18,09%	22,79%	22,46%	21,55%	19,72%
Sweden	Teliasonera	30,67%	31,41%	32,84%	31,95%	31,79%	30,81%	30,27%	27,33%	26,62%
	TOT average	19,61%	23,86%	23,12%	23,15%	24,19%	23,48%	22,43%	21,87%	19,86%

Appendix 4 - intangible assets goodwill excluded

INT. GW exl	Belgacom	602	590	482	552	623	1.190	1.155	1.097	1.185
	BT group	220	2.033	2.407	2.317	2.589	2.605	2.431	2.191	2.147
	Deutsche Telecom	33.940	37.059	33.764	33.301	31.371	33.286	33.069	27.407	31.405
	KPN	4.830	4.482	4.643	14.400	14.278	4.022	3.637	3.301	2.474
	Orange	18.865	18.713	16.658	14.009	9.953	11.302	11.343	11.818	11.744
	Portugal Telecom	3.602	3.491	2.309	2.521	2.884	696	5.071	3.640	718
	TDC	615	597	649	687	3.282	2.526	2.330	2.214	697
	Telecom Italia	6.810	6.740	6.985	6.492	6.282	7.936	8.637	7.927	6.280
	Telefonica	7.877	20.758	18.320	15.921	15.846	25.026	24.064	22.078	18.548
	Teliasonera	1.264	1.276	1.349	1.506	1.415	1.478	1.699	1.645	1.591
	SUM	78.625	95.738	87.566	91.706	88.523	90.067	93.436	83.318	76.789

Appendix 5 - Equity

Shareholders' Equity EUR Million	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgacom	2.591	2.399	2.525	2.276	2.528	3.342	3.303	3.093	3.042
BT group	5.619	2.393	5.826	5.551	190	-3.053	2.334	1.603	-313
Deutsche telecom	48.599	49.670	45.245	43.112	41.937	43.028	40.032	30.531	32.063
KPN	5.104	4.196	4.518	3.759	3.841	3.500	2.273	1.334	5.303
Orange	28.438	31.638	34.325	30.543	29.577	31.549	29.592	26.384	26.334
Portugal Telecom	2.255	1.338	2.081	1.199	2.384	4.609	2.828	2.854	1.866
TDC	5.824	441	4.293	4.244	3.639	2.798	2.992	2.883	2.732
Telecom italia	26.985	27.098	26.985	26.856	27.120	32.555	26.694	23.012	20.186
Telefonica	16.158	20.001	22.855	19.562	24.274	31.684	27.383	27.661	27.482
Teliasonera	13.532	13.187	12.421	11.875	13.204	13.969	12.948	12.752	12.133

Appendix 6 - Impairment charges

EUR million	Imp charges	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total impairments
Belgium	Belgacom	0	10	0	12	22	0	0	0	18	4
UK	BT group	0	0	0	63	0	2	47	0	0	3
Deutscheland	Deutsche telecom	1.920	10	327	289	2.345	395	3.100	360	605	9
Netherlands	KPN	40	1	0	125	30	2	154	314	0	7
France	Orange	11	2.800	26	271	449	509	611	1.732	512	8
Portugal	Portugal Telecom	28	0	0	0	0	0	0	0	31	2
Denmark	TDC	0	17	339	564	4	0	0	0	0	3
Italia	Telecom italia	6	0	0	23	6	57	7.364	4.289	2.187	7
Spain	Telefonica	10	17	0	0	0	0	0	414	0	3
Sweden	Teliasonera	0	1	1	0	0	19	0	880	131	5
	Average imp charges of the sample	202	286	69	135	286	98	1.128	799	348	
	Number of imp. for the year	6	6	4	7	6	6	5	6	6	

Appendix 7 - CGU allocation

	CGU allocation	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average	Min	Max
Belgium	Belgacom	ns	2	2	2	2	3	3	3	3	2,5	2	3
UK	BT group	ns	2	4	5	5	5	5	5	5	4,5	2	5
Deutscheland	Deutsche telecom	ns	7	7	8	5	4	4	4	5	5,5	4	8
Netherlands	KPN	7	6	9	8	8	9	9	8	8	8,0	6	9
France	Orange	ns	6	6	7	7	6	6	6	6	6,3	6	7
Portugal	Portugal Telecom	3	5	3	3	3	3	4	4	5	3,7	3	5
Denmark	TDC	2	2	2	1	4	3	3	3	2	2,4	1	4
Italia	Telecom italia	5	5	4	4	5	5	5	5	5	4,8	4	5
Spain	Telefonica	6	ns	4	4	4	3	2	3	3	3,6	2	6
Sweden	Teliasonera	4	6	5	4	4	4	4	4	4	4,3	4	6
	average per year	4,5	4,55555556	4,6	4,6	4,7	4,5	4,5	4,5	4,6			

Appendix 8 - Planning periods

	Planning period	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average	Min	Max
Belgium	Belgacom	ns	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
UK	BT group	ns	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
Deutscheland	Deutsche telecom	ns	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0
Netherlands	KPN				7,5	7,5	7,5	7,5	3,0	3,0	6,0	3,0	7,5
France	Orange	ns	5,0	5,0	5,0	5,0	5,0	4,0	4,0	4,0	4,6	4,0	5,0
Portugal	Portugal Telecom	ns	ns	ns	ns	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0
Denmark	TDC	10,0	10,0	10,0	5,0	3,0	3,0	3,0	3,0	3,0	5,6	3,0	10,0
Italia	Telecom italia	3,0	3,0	3,0	3,0	3,0	3,0	3,0	5,0	5,0	3,4	3,0	5,0
Spain	Telefonica	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
Sweden	Teliasonera	4,3	4,3	4,3	2,7	3,3	3,3	3,3	4,0	4,0	3,7	2,7	4,3
	average per year	5,6	5,9	5,9	5,4	5,1	5,1	5,0	4,8	4,8			

Appendix 9 - Valuation techniques

	Valuation techniques	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium	Belgacom	ns	VIU	VIU	VIU	VIU	VIU	VIU	VIU	VIU
UK	BT group	ns	VIU	VIU	VIU	VIU	VIU	VIU	VIU	VIU
Deutscheland	Deutsche telecom	FVLCD	FVLCD	FVLCD	FVLCD	FVLCD	FVLCD	FVLCD	FVLCD	BOTH
Netherlands	KPN	FVLCD	FVLCD	FVLCD	BOTH	BOTH	BOTH	BOTH	VIU	VIU
France	Orange	ns	BOTH	BOTH	VIU	VIU	VIU	VIU	VIU	VIU
Portugal	Portugal Telecom	ns	ns	VIU	VIU	VIU	VIU	VIU	VIU	VIU
Denmark	TDC	VIU	VIU	VIU	VIU	VIU	VIU	VIU	VIU	VIU
Italia	Telecom italia	VIU	VIU	VIU	VIU	VIU	VIU	VIU	VIU	VIU
Spain	Telefonica	ns	ns	VIU	VIU	VIU	VIU	VIU	VIU	VIU
Sweden	Teliasonera	ns	VIU	VIU	VIU	VIU	VIU	VIU	VIU	VIU
	VIU	2	5	7	8	8	8	8	9	9
	FVLCD	2	2	2	1	1	1	1	1	0
	BOTH	0	1	1	1	1	1	1	0	1

Appendix 10 - Post-tax discount rates

Av. post-tax	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgacom	ns	7,6	7,7	7,2	7	6,9	7,08	6,8	6,4
		9	8,7	9	10,1	9	9,04	9,2	9
Deutsche Telecom	ns	ns	ns	ns	6,51	5,88	5,96	6,16	6,23
					7,23	10,21	11,21	6,39	6,76
					7,71			10,55	10,48
					7,75	6,95	7,17	6,63	7,11
					7,97	6,68	6,6	7,32	7,75
					8,26	7,14	6,74	7,23	7,73
					11,24			5,8	8,78
								8,17	9,7
									7,15
									6,86
									10,18
									5,82
									7,97
Orange	ns	8,5	7,7	7,5	7,5	7,5	7,8	7,5	7
		8,5	7,7	8,75	8,25	9	10,4	9,8	8,8
		9	8,25	8,25	10,85	10,35	9	9,3	8,5
		11,3	8,5	11	11,25	11,75	8,5	8,5	8,5
			11	8,25	8,5	8,5	11,3	10,8	10
				11		8,6	8,5	8,5	7
				10		11,5	13	14	17,5
Portugal Telecom	ns	ns	ns	7,5	8,2	8,2	8,5	8,9	7,1
			ns	14	9,2	10,2	10	9,9	10,4
					11,2	8,2	5,9	8,9	8,1
					13,2	13,3	11,4	10,9	12,4
					8,2	9,7	5,9	9,9	
					12,9	15,3	13,4	12,9	
					9,2				
					14,9				
Telecom Italia	6,63	7	7,1	7,4					
	7,22	7,6	8,1	7,9	7,6	7,9	8,9	8,63	8
	7	6,8	7	8,2	9,28	9,77	9,36	9,48	8,43
Teliasonera	ns	7,5	8,8	8,96	7,46	7,05	7,14	6,85	6,875
		7,8	9,25	7,62	7,14	6,81	6,6	6,54	6,535
			11,1	8,7	6,075	5,8	5,2	5	5,6
MOY Sample	7,02%	8,24%	8,53%	8,90%	9,06%	8,89%	8,58%	8,59%	8,34
MED Dample	7,22	7,80	8,25	8,25	8,25	8,50	8,50	8,57	7,97

Appendix 11- Pre-tax discount rates

Av. Pre-tax	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgacom		7,5	11,4	10	9,6	9,3	9,6	9,6	8,4
		9,3	11,9	12,8	13,9	12,5	10,95	10,9	11,1
BT group	ns	11,4	10	10	11,1	10,8	10	9,2	8,8
			11,4	11,4					
KPN	7,80	9,40	8,00	9,50	8,00	8,00	7,50	6,50	8,50
		10,60	9,00	11,40	13,90	9,60	9,60	7,00	9,00
		10,00		16,00				6,50	9,50
				9,50				7,50	10,00
				11,40				13,00	16,00
								14,00	17,00
Orange	ns			10,3	12,95	11,9	13,2	13,4	13,6
				10,9	12,7	11,4	11,6	12,4	11,2
				12,1	11,2	11,8	12,3	11,7	11
				12,1	10,2	14	12,3	11,3	10,2
				12,5	13		13	12,4	11,4
				15,8			11,8	12,3	10
							15,1	16,7	16,7
TDC	6,6	7	7,2	7,7	6,8	8,1	7,9	6,9	6,9
	9,6	9,8	10,3		7,7	8,5	8,1	7,3	7,3
					8	8,7	8,1	7,7	7,7
					8,4		8,5	7,9	7,7
					8,6		8,5	8,1	
					9,1		8,7	8,5	
					9,3				
					9,4				
Telecom Italia					11,21	11,6	12,91	12,5	11,61
					13,76	14,48	13,77	13,65	12,38
Telefonica	ns	ns	7	7,6	6,3	6,3	5,9	5,8	5,3
			7,7	7,8	6,8	7,8	7,5	6,1	6,1
			8,1	8,5	7,3	8,6	11,2	7,7	6,3
			11,3	10,1	8,5	10,9	14,8		
MOY Sample	8,00%	9,38%	9,44%	10,87%	9,91%	10,24%	10,53%	9,87%	10,15%
MED Dample	7,8	9,6	9,5	10,6	9,35	10,2	10,475	9,2	10

Appendix 12 - Growth rates

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belga	ns	2	0,5	0	0	0	0	0	0
			2	1	1,6	1,6	1	1	1
BT	ns	0	0	0	2	2	2	2	2
		2	2		2,5	2,5	2,5	2,5	2,5
DT	ns	ns	ns	ns	1	1	1	1	1
					2,5	1,5	1,5	1,5	1,5
					2	2	2	2	2
					1,3	2,5	1		
					2,3	1,5	1,5		
					1,5				
KPN	ns	ns	ns	0	0	0	0	0	0
		ns	ns	2,2	2	1,5	1,4		
Orange	ns	1	1	0	0,5	0,5	0,5	0,5	0,5
		2	2	2	1,5	1	1,5	1,5	1,5
		2	0	3	2	1,5	1	1	1
		0	0	2	2	3	0	0	0,3
		3	0	4	0	1,5	2	2	2
			1,5	0		0	1,5	0,5	0,5
PT	ns	ns	ns	ns	0,5	0,5	0	1	1
				ns	1	1	2	1,5	1,5
						0,5	0	0	0
						2,5	2,5	2,5	3
					0,5	1	0,5	0,5	1
					2,5	3	3	3	4
					1				
					3				
TDC	4	2	2	2	2,5	2,5	2,5	0	0
	2	2	2		2,5	2,5	2,5	0	0
					2	2	2	1	
					2	4			
TI	0,5	1	0,5	-0,5	-0,35	-0,26	0	0	0
	0,5	0	-0,5	0,5	-0,5	-0,5	0	0	0
	-1	0,5	0,5						
	0,5			0					
TELE	ns	ns	ns	ns	0,88	0,91	0,51	0,8	0,8
					0,94	1,1	0,59	1	1
					1	1,28	0,96	1,1	1,1
					2	1,46	1,07		
Telia	ns	2	1	1,83	2	2	2	1,75	1,875
		3	2,5	1	1	1	1	0,86	0,857
			1	1	1,75	1	1	1	1
Av. g-rate	1,08%	1,47%	1,00%	1,11%	1,41%	1,42%	1,22%	1,02%	1,10%

Med. g-rate	0,50%	2,00%	1,00%	1,00%	1,55%	1,48%	1,00%	1,00%	1,00%
Min. g-rate	- 1,00%	0,00%	- 0,50%	- 0,50%	- 0,50%	- 0,50%	0,00%	0,00%	0,00%
Max. g-rate	4,00%	3,00%	2,50%	4,00%	3,00%	4,00%	3,00%	3,00%	4,00%

Appendix 13 - ECB inflation rates

(source: <https://www.ecb.europa.eu/stats/prices/hicp/html/inflation.en.html>)

dec-13	0,008	juin-09	-0,001
nov-13	0,009	mai-09	0
oct-13	0,007	avr-09	0,006
sept-13	0,011	mars-09	0,06
août-13	0,013	févr-09	0,012
juil-13	0,016	janv-09	0,011
juin-13	0,016	déc-08	0,016
mai-13	0,014	nov-08	0,02
avr-13	0,012	oct-08	0,032
mars-13	0,017	sept-08	0,036
févr-13	0,017	août-08	0,04
janv-13	0,017	juil-08	0,04
déc-12	0,02	juin-08	0,037
nov-12	0,02	mai-08	0,033
oct-12	0,025	avr-08	0,036
sept-12	0,026	mars-08	0,033
août-12	0,026	févr-08	0,032
juil-12	0,024	janv-08	0,031
juin-12	0,024	déc-07	0,031
mai-12	0,024	nov-07	0,026
avr-12	0,026	oct-07	0,021
mars-12	0,027	sept-07	0,017
févr-12	0,027	août-07	0,018
janv-12	0,027	juil-07	0,018
déc-11	0,027	juin-07	0,019
nov-11	0,03	mai-07	0,019
oct-11	0,03	avr-07	0,019
sept-11	0,03	mars-07	0,019
août-11	0,025	févr-07	0,018
juil-11	0,026	janv-07	0,018
juin-11	0,027	déc-06	0,019
mai-11	0,027	nov-06	0,019
avr-11	0,028	oct-06	0,016
mars-11	0,027	sept-06	0,017
févr-11	0,024	août-06	0,023
janv-11	0,023	juil-06	0,024
déc-10	0,022	juin-06	0,025
nov-10	0,019	mai-06	0,025
oct-10	0,019	avr-06	0,025
sept-10	0,019	mars-06	0,022
août-10	0,016	févr-06	0,023
juil-10	0,017	janv-06	0,024
juin-10	0,015	déc-05	0,022
mai-10	0,017	nov-05	0,023
avr-10	0,016	oct-05	0,025
mars-10	0,016	sept-05	0,026
févr-10	0,008	août-05	0,022

janv-10	0,009	juil-05	0,022							
déc-09	0,009	juin-05	0,021							
nov-09	0,005	mai-05	0,02							
oct-09	-0,001	avr-05	0,021							
sept-09	-0,003	mars-05	0,021							
août-09	-0,02	févr-05	0,021							
juil-09	-0,006	janv-05	0,19							
Average	2005	2006	2007	2008	2009	2010	2011	2012	2013	
ECB inflation rate	3,62%	2,18%	2,03%	3,22%	0,60%	1,61%	2,70%	2,47%	1,31%	

Appendix 14 - Disclosures

Discount rates disclosures	
Belgacom	both
Deutsche telecom	post
BT group	pre
KPN	pre
Orange	both
Portugal Telecom	post
TDC	pre
Telecom italia	both
Telefonica	pre
Teliasonera	post
Both	3
Post-tax	3
Pre-tax	4

Disclosures about rates	
Belgacom	range
Deutsche telecom	range
BT group	CGU specific
KPN	CGU specific
Orange	CGU specific
Portugal Telecom	CGU specific
TDC	CGU specific
Telecom italia	CGU specific
Telefonica	CGU specific
Teliasonera	CGU specific
CGU specific	80,00%
Range	20,00%

Sensitivity analysis	
Belgacom	YES
BT group	YES
Deutsche Telecom	NO
Orange	YES
KPN	yes
Portugal Telecom	NO
TDC	NO
Telecom Ita	yes
Telefonica	YES
Teliasonera	YES

# CGU ≥ # operating segment	
Belgacom	YES
BT group	YES
Deutsche telecom	YES
KPN	YES
Orange	YES
Portugal Telecom	YES
TDC	YES
Telecom italia	YES
Telefonica	YES
Teliasonera	YES