Goodwill Impairment

1. Predicting goodwill impairment with the market reaction to acquisitions

Godefroy Späth, Robert Trampler
Abstract

In the economy intangible assets have become more and more important. Financial standards have evolved in order to capture this change and to be relevant. IFRS are international financial accounting standards with the goal to provide investors relevant information in their investment decision process.

Since 2005, all listed companies in the European Union have to implement the IFRS 3; Forcing companies to write off their goodwill instead of amortizing it. The goal of this measure was to provide investors more information about management’s investment decisions. Beside, companies proceed to firm acquisitions in order to gain a competitive advantage. Such events are important in companies’ life and are impacting the potential value creation. Out of that reason, investors are reacting to acquisition announcements. Moreover, the market reacts to goodwill impairments.

The purpose of this research was to examine to what extent the market reaction of an acquisition announcement can predict goodwill impairment in the two following years. This study was conducted using a quantitative method; focusing on aspects of the financial statements of 43 companies from the Nordic countries that acquired companies in the G20 countries. A Spearman’s correlation, logistic and linear regressions were pursued in order to observe the correlation and the strength of the relationship between goodwill impairment and the market reaction.

The findings imply that the market reaction can predict goodwill impairment in the first year after an acquisition in case of positive market reaction. Additional to that, it can also predict the amount of impairment in the second year, but not whether the impairment is happening. Also, there is a correlation between the first and second year goodwill impairments. However, the results of this research indicate that neither the industry, financial or non-financial, nor the deal value can predict goodwill impairment after an acquisition.

Keyword: Goodwill impairment, market reaction, Nordic countries, G20, earnings management, IFRS 3, merger and acquisition
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Godefroy Späth & Robert Trampler
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<thead>
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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>IND</td>
<td>Industry sector</td>
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<tr>
<td>IDC</td>
<td>Industry coded</td>
</tr>
<tr>
<td>DFS</td>
<td>Variation of the financial structure</td>
</tr>
<tr>
<td>DSP</td>
<td>Variation of the stock price</td>
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<tr>
<td>DSPC</td>
<td>Variation of the stock price coded</td>
</tr>
<tr>
<td>IGY1C</td>
<td>Coded impairment of the goodwill impairment at year one</td>
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<tr>
<td>IGY2C</td>
<td>Coded impairment of the goodwill impairment at year two</td>
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<tr>
<td>GSY1</td>
<td>Scaled goodwill impairment in year one</td>
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<tr>
<td>GSY2</td>
<td>Scaled goodwill impairment in year two</td>
</tr>
<tr>
<td>M&amp;A</td>
<td>Merger and acquisition</td>
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<tr>
<td>IFRS</td>
<td>International Financial Reporting Standards</td>
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<tr>
<td>IASB</td>
<td>International Accounting Standards Board</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief executive officer</td>
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<td>CFO</td>
<td>Chief financial officer</td>
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1. Introduction

The introductory part of this thesis has the purpose to provide the background of the study. Moreover, it explains the purpose of this study. Additionally, the research gap is stated and at the end of this chapter the research question, which this study aims to answer, is presented.

1.1. Subject choice

We are two accounting students studying "accounting, auditing and control" at Umeå University. While the advance financial accounting course we got interested in the topic of goodwill. At the time, we learned more about goodwill and the impairment according to IFRS 3, we understood that with this regulation there is much room for earnings management. Since there is nearly every week an article about some big acquisition in the news at the moment, we figured out that goodwill in relation to acquisition would be an interesting choice for our master thesis.

1.2. Background

After the financial crisis in 2007/8, many of the European countries had difficulties to keep a positive growth level (Verdun, 2015, p. 219-220). Following this problem, the inflation in the European market decreased to a critical level (Micossi, 2015, p. 7). Especially in the southern countries reached the inflation a dangerous low level (Dauderstädt, 2016, p. 7) that the European Central bank was alarmed and had to take initiative in order to prevent a deflation. Moreover, many essential banks were in danger to go bankrupt (Acharya & Steffen, 2015, p. 216). Therefore, the European Central bank started a giant program and floated the European market with cheap money (Micossi, 2015, p. 14-15) and lowered the interest rate (Ricci, 2015, p. 245) with the purpose that companies would be more solvent and could invest more. Even that this program is heavily criticized by some countries, especially Germany (Fratzscher et al., 2015, p. 1), the European Central Bank keeps this path and an end is not identifiable. This had the result that companies realized that it would be the perfect moment to proceed to undertake acquisitions in order to become more stable. But also, because they were scared that, if they would not take over other companies and to grow with this acquisition, they would be acquired by other companies.

However, since the pressure is high to use this moment, many companies also made acquisitions that harmed the company more than it had beneficial synergies. Moreover, since the money is cheap, because of the money float of the European Central Bank (Ricci, 2015, p. 245), also the stock prices of most companies are increasing (OECD, 2018) with the effect that acquisitions become more expensive. In case the investors saw that the acquisition would be harmful to the company, the market reaction tended to be negative and the stock price of the company decreased (Andrade et al., 2001, p. 109). In order to even the losses and to satisfy the investors, the management of companies has several options. One option is to use earnings management (Burgstahler & Dichev, 1997, p. 100). Due to the fact that in 2005 the IASB changed the regulation that goodwill is not any longer amortized over a period of time, but impaired based on subjective decisions (Hamberg & Beisland, 2014, p. 60). This is often criticized for increasing the chance for earnings management (Zang, 2008, p. 39). By using the goodwill for the earnings management to even the losses, companies can postpone the impairment of goodwill to some later years, when the situation for the company is better...
again (Pajunen & Saastamoinen, 2013, p. 255). Also, the management is often not only performing earnings management with goodwill with the single intention to satisfy the investors, but also having the purpose in mind that if the performance of the company decreases, their performance-based compensation will be lowered (Kumar et al., 2015, p. 2114). Furthermore, some of the compensation of the management is delivered in form of stock packages. That means that, if the goodwill is impaired too early, the management could lose some of their wealth too. Another issue with the impairment of goodwill is, that in contrast to the impairment of other assets, the impairment of goodwill is permanent and cannot be revised (Lhaopadchan, 2010, p. 123). This fact makes the impairment of goodwill even more difficult, since the management needs to think about all the impact that impairment will have, and this has the result that the management is careful not to lower the goodwill too much.

1.3. Purpose of this study
The purpose of this study is to find out, whether a relationship between the market reaction to acquisitions and the impairment of goodwill in the two years afterwards exists. As stated in the background, it could be possible that the management undertakes earnings management in order to satisfy the investors of the company, but also to save their own wealth. On the other hand it could have also other reasons, but the aim of this research is to find out, whether a correlation between the market reaction and the impairment exists and not why.

In case the results of this study show a correlation between the market reaction of acquisitions and the impairment of goodwill, it is a sign for the shareholders of companies that the company, they are investing in, needs more mechanisms for controlling the management of the company. However, the results of this study are not only interesting for shareholders of acquiring companies, but also for accounting standard setters. For this last group the results are interesting, since they can see, whether there is eventually a correlation between the market reaction to acquisitions and the impairment of goodwill and that could mean that earnings management is used in this circumstance. Therefore, they can adjust the accounting regulation to the practical reality in order to give less room for earnings management.

Hence, with this study it is aimed to contribute to research conducted within the field of Nordic impairment accounting. The Nordic countries were chosen, because on the one hand we are two students studying in Sweden and on the other hand are Nordic countries in that sense interesting that they are considered more transparent than most other countries.

1.4. Research question
To what extent does the market reaction to acquisition announcements predict the goodwill impairment?
1.5. Theoretical background and research gap

The first reference that dealt with the nature of the term “goodwill” was first mentioned in the 19th century in Bithell’s "A Counting House Dictionary" (Courtis, 1983, p. 2). From that point it was always further developed. Then, in 2000/1 the USA experienced a scandal among companies, which inflated their balance sheets by reporting excessive goodwill from mergers (Hall & Davis, 2014, p. 3). This inflating was possible because of the regulations, how goodwill had to be amortized. As a result of that the Financial Accounting Standard Board (FASB) changed the regulations from goodwill amortization to goodwill impairment in 2001.

A few years after that, the International Accounting Standards Board (IASB) introduced IFRS 3, which also abolished the goodwill amortization and introduced the goodwill impairment method (Hamberg & Beisland, 2014, p. 60). With the introduction of the impairment method, the IASB intends also to increase the value of information that the impairment testing has for financial reporting. This is because the amortization method contains little to no value (Mazzi et al., 2016, p. 356). And that is normally the purpose of financial statements, to communicate information to external users like investors, lenders or other creditors (Higgins, 2012, p. 3). In order to be useful for those groups, the information, contained in these statements, needs to be of valuable relevance. This is the case, if there is a correlation between its use by investors to value the company and its stock price (Wyatt, 2008, p. 217). A study in 1999 by Lev and Zarowin (p. 383) resulted that the usefulness of financial information has decreased over 20 years. Therefore, the task for accounting standard setters is to make changes in order to increase the relevance again.

The difficulty with the writing-off of goodwill is that it is not restorable, which means that the decision to impair goodwill is permanent (Lhaopadchan, 2010, p. 123). Also, Van Hulzen et al. (2011, p. 94) state in their research that the writing-off method was changed from goodwill amortization to goodwill impairment due to the fact that the amortization of goodwill often led to arbitrary accounting. Moreover, they mention that also after the change of regulation it is not clear, whether this shift has impact on an improvement of goodwill accounting.

Since the goodwill impairment method includes judgment for the write-off, in some studies it is criticized for contributing to earnings management (Pajunen & Saastamoinen, 2013, p. 245). It can either be not recognized and therefore the impairment postponed, or it can be used as an earnings bath in times of low profitability. The problem that it is based on subjective of management is, that the assumptions and estimations are difficult to confirm (Knauer & Wöhrmann, 2016, p. 421).

At this point the agency theory is important to be mentioned. It defines the relationship between the owner (principle) and the management (agency) (Eisenhardt, 1989, p. 58). The agency theory is important in this context, hence the earnings management is only possible, because of the information asymmetry that can be explained by this theory (Bosse & Phillips, 2016, p. 276). Furthermore, it also explains the different goals the agent and the principle are following (Eisenhardt, 1989, p. 58).

To come back to goodwill, the impairment of goodwill is associated with good corporate governance and with the willingness of managers to communicate
information about the future performance of the firm (AbuGhazaleh et al., 2011, p. 196). This is, because goodwill impairment is negatively related to companies’ performance (Glaum et al., 2015, p. 32) and with the stock price in the short-term (Cheng et al, 2017, p. 328). Resulting from that, companies are more likely to write-off their goodwill in times their stock prices are up (Cheng et al, 2017, p. 324).

Many studies focused on the effect the impairment has on the stock price (Hirschey & Richardson, 2003; Cheng et al., 2017; Li et al., 2011) instead of what effect stock price changes have on the impairment of goodwill like this research does. Goodwill comes from acquisitions and these are one of the toughest decisions a CEO has to make. A downside nowadays is that most acquisitions do not add any value to the acquiring company (Darrough et al., 2014, p. 435).

The market reaction to acquisitions gives a gauge, whether the take-over creates or destructs value for the shareholders (Andrade et al., 2001, p. 109). In a capital market that happens quickly and is efficient due to public information. If the acquiring company has potential for growth and the probability is high that it will be successful in transferring this potential also to the target company, this information has positive effect on the market reaction (Tanriverdi & Uysal, 2015, p. 152). That means in short that companies are looking for targets to acquire, which could result in synergies (Svetina, 2012, p. 537). The market reaction also depends as well on the health of the target’s health as the acquirer’s health and their competitor’s health (Geiger & Schiereck, 2014, p. 27). Additional to that, companies try to diversify themselves with acquisitions to reach a point that they have fewer potential losses in an economic crisis (Mukherjee et al., 2004, p. 18).

An M&A can create value through performance gains, the access to an extensive market, and the market for corporate control (Sehleanu, 2015, p. 600). Accordingly, M&As have a higher chance to happen between companies with a similar economic profile (Hoberg & Phillips, 2010, p. 3775). Besides, M&As are seen as a way to restructure a business and to create value (Huyghebaert & Luypaer, 2012, p. 1832). Companies with overvalued stock prices have a higher ability to survive and an advantage in their acquisition strategy (Shleifer & Vishny, 2003, p. 309). In addition, also the payment method impacts the return, since a study of Andre et al. (2004, p. 41) shows that acquisitions on cash base outperform those based on equity.

In case the market reaction is worse than expected, it has impact on the decision of the CEO to proceed the acquisition. In some cases the CEO cancels those plans (Kumar et al., 2015, p. 2113). That is, because the market reaction has not only impact on the wealth of the shareholders, but also on the future of the CEOs position and his own wealth (Luo, p. 1970; Lehn & Zhao, 2006, p. 1809). Thus, to improve the market reaction, the management has to communicate about the growth plan, its strategy, and its resource management (Balog, 1975, p. 26).

Most mergers happen in waves and some theories say that the reason for this is, since the market responds to shocks with merger waves (Park & Town, 2014, p. 548). That can also be argued with the efficient market theory. According to Fama (1970, p. 383), an efficient market always displays all available information. Therefore, its prices give signals for resource allocations.
In the article “Using Real Activities to Avoid Goodwill Impairment Losses: Evidence and Effect on Future Performance” (Filip et al., 2015, p. 551), the researchers mention that more research is needed in the area of goodwill impairment. They identify that previous literature did not focus on the effect, which the market reaction to merger deals will have on the management of the acquiring company in regard to the impairment of goodwill.

Based on this article we found out that this specific area is an interesting topic for our master thesis, since it has not been researched in the past. Furthermore, after researching the studies that have already been conducted on this field, we found out that research in this area mainly focuses on how the impairment impacts the stock price. Other studies looked for the reasons why goodwill impairment happens in general or what indicators for goodwill impairment exist. After searching through all these studies it became clear that there is a research gap in this field. The gap is that to this point no research was conducted with the intention to find out whether the market reaction to acquisitions can predict the impairment of goodwill in the two years after the acquisition.

By writing this master thesis it is aimed to fill the gap in this research area. The outcomes could be an indicator, whether the top management of acquiring companies use earnings management with the intention to on the one hand satisfy their shareholder and on the other hand preserve their own wealth after a risky acquisition. But this is beyond this research.
2. Theory

In this chapter previous literature is going to be reviewed. It is divided into literature about goodwill, the market efficiency and the M&A. Each section contains knowledge about topics related to this degree project. These theories will be compared to the findings in the discussion chapter.

2.1. Goodwill accounting

Goodwill is linked to intangible assets and arises after a combination. Since our economy shifted from a tangible to an intangible assets economy and the modification of the financial standards highlighted the importance of its fair value, goodwill is more and more revealing management's decisions.

2.1.1. The concept of Goodwill

The definition of goodwill evolved over the time and this change is confusing. It is not only confusing according to the accounting rules, but also according to the law (Carlin & Finch, 2011, p. 370). A first approach in the 19th century defined goodwill as an asset that will increase the business production. This definition was also impacted by the apparition of new technologies over time. The evolution of the term goodwill was mandatory, since it is a vital notion in business administration as Miller (1973, p. 285) states it: “the term ‘goodwill’ is necessary for the accountant because he attempts to disaggregate the purchase price for an organized whole only by isolation of elements which are classifiable according to traditional accounting procedure and which can be valued arbitrarily in terms of some historic costs or external market values”. This definition highlights the fact that the goodwill is an asset. Indeed, the conceptual framework (IFRS, 2017) defines an asset as “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”.

According to accountants there are two ways to measure the goodwill: the abnormal profits approach and the difference between the price of the purchased price and its fair-value (Wen & Moehrle, 2016, p. 13).

According to Ratiu & Tudor (2013, p.138) the fact that the goodwill is at the origin of 70% of the market capitalization made the goodwill an important accountant item. There are three types of goodwill: positive goodwill, negative goodwill and internal generated goodwill (Ratiu & Tudor, 2013, p. 141). Positive goodwill arises during business combinations when synergies are expected. Synergies are expected during a business combination when the acquirer and the acquired company’s systems interact positively with their environment and benefits are obtained for the whole group (Ratiu & Tudor, 2013, p. 147). The IFRS 3 p. 35 defines the negative goodwill as “A bargain purchase is a business combination in which the net fair value of the identifiable assets acquired and liabilities assumed exceeds the aggregate of the consideration transferred, the noncontrolling interests and the fair value of any previously-held equity interest in the acquiree.” Internally generated goodwill is not recognized by the accounting standards (Ratiu & Tudor, 2013, p. 143).

After a business combination the acquirer must recognize each acquired intangible asset (IFRS 3). However, they are not often recognized (Hamberg et al., 2011, p. 264-265).
According to (2007, cited in Carvahlo et al., 2016, p. 6) goodwill is overstated whereas intangible assets are understated. This author finds that the 100 largest companies in the United States attributed 48% of the cost of the business acquisition to the goodwill whereas 28% of the cost of the business acquisition was attributed to the intangible assets. Acquirers might not recognize them in a proper way, because they are hard to identify separately during a business combination (Carvahlo et al., 2016, p. 4). Another explanation is possible: acquirers want to reduce their future costs by increasing the goodwill. In fact, goodwill is not subject to amortization but to impairment whereas intangible asset must be amortized what leads to accrual costs in the future (Carvahlo et al., 2016, p. 4).

2.1.2. IFRS 3 and Goodwill

IFRS 3 (2017) is about business combination and its effect about the acquirer. The aim of the guideline is to provide the most accurate information about business combination and its impacts. IFRS 3 (2017, para. 5) provides an acquisition method, where the main steps are:

- Identification of the 'acquirer'
- Determination of the 'acquisition date'
- Recognition and measurement of the identifiable assets acquired, the liabilities assumed and any non-controlling interest (NCI, formerly called minority interest) in the acquirer
- Recognition and measurement of goodwill or a gain from a bargain purchase

“Identifiable assets acquired, liabilities assumed and non-controlling interests in the acquiree, are recognized separately from goodwill” (IFRS 3, 2017, para. 10). They must be recognized at their fair value at the acquisition date (IFRS 3, 2017, para. 18).

According to IFRS 3 (2017, para. 32) Goodwill is measured as the difference between:

- The aggregate of (i) the value of the consideration transferred (generally at fair value), (ii) the amount of any non-controlling interest, and (iii) in a business combination achieved in stages, the acquisition-date fair value of the acquirer's previously-held equity interest in the acquiree, and
- The net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed

There is the “partial goodwill” method and the “full goodwill” method (IFRS 3, 2017, para. 19). The “full goodwill” includes the minority interest in the goodwill and the non-controlling interest is measured at fair value. With the “partial goodwill” only majority’s share of goodwill is recognized. If less than 100% of the shares are acquired, the amount of goodwill will depend on the proportion of shares acquired. Non-controlling interest measured as the minority’s share of the fair value of the net assets. According to the IFRS 3 (2017, para. 64) some disclosures are mandatory:
In 2000/1 the USA experienced a scandal among companies, which inflated their balance sheets by reporting excessive goodwill from mergers (Hall & Davis, 2014, p. 3). This inflating was possible, because of the regulations, how goodwill had to be amortized. As a result of that, the Financial Accounting Standard Board (FASB) changed the regulations from goodwill amortization to goodwill impairment in 2001. A few years after that, the IASB introduced IFRS 3, which also abolished the goodwill amortization and introduced the goodwill impairment method (Hamberg & Beisland, 2014, p. 60). This implementation of the IFRS 3 generated new challenges for companies (Mario et al. 2001, p. 557). There are challenges in the measurements and disclosures related to the business combination itself and to the impairment of the goodwill (Mario et al. 2001, p. 558).

Since the environment has become more complex, accountants face issues when it comes to the allocation of business combination costs (Mario et al. 2001, p. 559). In fact, tangible and intangible assets must be recognized separately. And the goodwill, that is equal to the difference between the purchasing price and the market value of assets, must be recognized as an intangible asset (Mario et al. 2001, p. 560). Because all assets had to be amortized, goodwill and other intangible assets were not really separated. However, with IFRS 3 goodwill cannot be amortized anymore, but it has to be impaired. Moreover, it has to be recognized at its fair value. Companies have also to allocate a fair cost to the goodwill, what represents a challenge for the companies (Mario et al. 2001, p. 560). Additionally, with the implementation of IFRS 3, companies must disclose more elements about business combinations. According to Mario et al. (2001, p.261), such disclosures represent a challenge for European companies because they are not used to communicate about these elements.

2.1.3. Goodwill impairment testing

In 2004, the European Union decided that from 2005 onwards all listed companies have to use the impairment method instead of amortizing purchased goodwill (Knauer & Wöhrmann, 2016, p. 424). According to Mazzi et al. (2016, p. 356) there are two reasons why accounting is shifting from the traditional amortization towards impairment testing: Firstly, the information of amortization has little to no value for the user of the financial statements. And secondly, the impairment testing provides more accurate and more useful information for the user of the financial statement.
The recoverable amount is defined as the higher of either fair value less costs to sell or value in use. The value in use can be defined as “the present value of the future cash flows expected to be derived from an asset or cash-generating unit” (Husmann & Schmidt, 2008, p. 50). There are three different types of assets for which the recoverable amount has to be tested each year: Firstly, intangible assets with indefinite useful life, secondly, assets that are not available for use yet, and thirdly, the goodwill acquired in business combinations (IFRS, 2017). However, each reporting period all other assets have to be assessed, whether there is any indication that the asset could be impaired. In such a case the asset should be tested for impairment (IAS 36, 2017 para. 9).

The purpose of the impairment test according to IAS 36 (2017) is, that an asset must not be held in financial statements at a higher amount than it could be recovered through its use or sale (IFRS, 2017). In case that the carrying amount of the asset is higher than the recoverable amount, it is impaired, and the amount has to be reduced to the recoverable amount. The difference between these two amounts is the impairment loss. In order to perform the impairment test, companies need to value their operational business units by using processes based on forward looking information like for example business plans etc. (Glaum et al., 2013, p. 165). Furthermore, IAS 36 (2017) defines how the calculation for the value in use has to be carried out. Included in this calculation are the future cash flow expectations and the discount rate (Kvaal, 2010, p. 87). The basis for the impairment tests of goodwill are also based on the subjective of management, what makes the assumptions and estimations hard to confirm (Knauer & Wöhrmann, 2016, p. 421). However, to provide transparency to investors and other stakeholders, companies need to disclose information related to these assumptions made in the estimations of the recoverable amount (Mazzi et al., 2016, p. 356). The discounted cash flow calculation is needed in order to determine the value in use (Husmann & Schmidt, 2008, p. 50).

The difference between the impairment test of goodwill and the test of any other asset is that the impairment loss for goodwill is permanent and cannot be reversed (Lhaopadchan, 2010, p. 123). Resulting from that, some companies either time the write-downs or even postpone them, since the write-downs always have impact on the profits of the company (Knauer & Wöhrmann, 2016, p. 422). This is often criticized, as it is one method to practice earnings management, since it helps to postpone losses (Caruso et al., 2016, p. 125).

2.1.4. Practical issues and criticism

The change from the amortization of the goodwill to impairment tests enables the user of financial statements to get more information about the company. With this reform the goodwill is more important for the analysts, since it translates the ability of the management to make the right acquisition choices. In fact, according to the conceptual framework (2017 para. 12-16), financial statements must be a faithful representation of the economic reality of the company. To achieve this goal, fair value measurement must be used (IFRS, 2107, para. 13). Fair value is thought to be an accurate measure of economic performance, nevertheless it might be not “fair”, because of estimations inaccuracy (Penman, 2007, p.33). The main advantage of this measure is that the stated goodwill will be more aligned to the real economic performance. In this way the balance sheet is more informative about companies’ performances. This new treatment gives more information about the management’s decisions (Wines et al. 2007, p.868).
However, some technical issues are related to this guidance. First, there is a risk that companies do not comply with the regulation. (Carlin & Finch, 2011, p. 368) show that Australian listed companies systematically do not respect the impairment of goodwill. Indeed, companies are unable to adapt themselves to the new regulation due to a lack of internal ability. This lack of compliance could find its origins in “lack of understanding of reporting frameworks by preparers, lack of resources to fully implement the requirements of applicable standards on the part of preparers, and lack of understanding and resources on the part of auditors [...]” (Carlin & Finch, 2011, pp. 372-373). One of the biggest challenges is related to the identification of cash generating units (CGU). As defined in the paragraph 6 of the IAS 36 (2017) "a cash generating unit is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash flow from other assets or group of assets (IAS 36, 2017, para. 6). Companies face this challenge when they acquired another entity that has different CGUs. After that, they must identify the recoverable amount for each unit. The challenges are due to the identification of CGUs, their valuation, the time spent to identify and value them, and the judgment that accountants must use to impair them in the right way (Wines et al., 2007, p. 870). In addition to these challenges, there is another one for the auditors. Indeed, they must assess that the goodwill was impaired in the proper way (Wines et al., 2007, p. 872).

Beside these challenges, there are some trust issues related to goodwill impairment. Sometimes goodwill must be tested when the conditions are uncertain. According to Klimczak et al. (2016, p. 657), who focus on the effect of uncertainty of the external environment on disclosures in Poland, uncertainty has no impact on the disclosures. Financial statements are based on facts and a discussion about the reliability of the financial statements would question management's skills (Klimczak et al., 2016, p. 657). Moreover, with this new guidance the fair value of goodwill depends on the managements’ appreciations: it must use its professional judgment (Hamberg & Beisland, 2014, p. 71). This need for judgment from different actors render the IFRS standard ambiguous. Financial managers and accountants must use their financial and valuation skills in order to agree on assets’ fair value and auditors have to use their professional judgment in order to assert that the financial statements are free of material misstatements (Wines et al. 2007, p. 863).

Impairment of goodwill is associated with good governance and with the willingness of managers to communicate information and about the future performance of the firm (AbuGhazaleh et al., 2011, p. 196). Efficient corporate governance will encourage managers to report impairment linked with the economic reality (AbuGhazaleh et al., 2011, p. 197).

Corporate acquisitions are one of the toughest decisions for a CEO and nowadays acquisitions often do not add value to companies (Darrough et al., 2014, p. 435). Sometimes CEO’s compensation is contractually linked to companies' financial performances like ROA, ROE or to goodwill impairments (Darrough et al., 2014, p. 436). This disposition is implemented to push CEOs to take optimal decisions. However, it acts also as an incentive for CEOs to do some earnings management and not to impair goodwill in a proper manner (Darough et al., 2014, p. 435). Then, with the adoption of IFRS 3, the earnings of companies increased on an accrual basis, because companies were not obliged to amortize the goodwill anymore (Hamberg et al., 2011, p. 264). According to Beatty and Weber (2006, p. 257), the debt covenants impact the
way managers are writing off the goodwill. Indeed, covenants are often about leverage and gearing. If the goodwill is written off, there will be an equity decrease that will impact the gearing or the leverage. However, this new method can lead to more earnings management (Wines et al. 2007, p. 868).

Goodwill impairment is negatively correlated to companies’ performance (Glaum et al., 2015, p. 32). It means that the better the performance is, the higher is the probability the goodwill will be impaired. However, goodwill impairment is also impacted by the governance. Furthermore, companies are more willing to impair their goodwill in the proper time, if they are in a country with a strong enforcement system (Glaum et al., 2015, p. 33). Goodwill is generally not related to the economic value of the acquired company (Bugeja, & Loyeung, 2015, p. 245). Even if goodwill is useful in the financial analysis process, a large amount of it could have a positive and a negative impact. Large amounts of goodwill could be dangerous for a company during a crisis, if the company must recognize high impairment losses. However, if the company respects the requirements about the disclosures it has a positive impact on its valuation (Baboukardos & Rimmel, 2014, p. 13). According to Clinch (1995, p. 22), there is no real evidence of correlation between goodwill amortization and stock prices. The change from the amortization of the goodwill to its impairment enables the user of financial statements to get more information about the company.

2.2. Information and stock prices

With the implementation of the IFRS 3, managers can choose how they impair the goodwill by using their professional judgment and they can also use it, to communicate about the company’s economic opportunities and to manage contractual and political payoffs. As the goodwill impairment is public information, rational investors have the possibility to use it in order to make a thought investment decision. However, the impact of this information is limited because the goodwill is not impaired when period of earnings change (Sherrill, 2016, p. 69).

Before the adoption of IFRS 3, researches highlighted the fact that stock prices were negatively impacted by the goodwill amortization on the short and long term (Cheng et al., 2017, p. 327). According to Cheng et al. (2017, p. 328), the stock price is negatively impacted by the goodwill impairment in the short term. It is remarkable that in the long-term goodwill impairment has a positive impact on the stock price. This is due to the fact that investors perceive goodwill impairment as a positive event in the long term. The stock price momentum is the only performance indicator that impacts the impairment of the goodwill. Companies are also more likely to write-off their goodwill when the stock price is lower (Cheng et al., 2017, p. 324).

On the other hand, the stock market reacts negatively to the announcement of goodwill write-offs (-1.5% on average). Nevertheless, the goodwill impairment seems to be taken into account by the investor months before. After this impairment, an increase of the profitability is observable. That is why it can be thought that the market is overreacting (Feuilloley & Sentis, 2007, p. 121). In the same way, Hirshey & Vernon (2003, p. 75) find that investors first underreact to the goodwill impairment announcement by a little decrease of the stock price. Nonetheless, they react afterwards, and this reaction affects harshly the stock price. This new reaction to the goodwill write off announcement has more negative effect on the stock price.
Jennings et al. (2000, p. 26) find that the earnings before goodwill amortization are more useful in the explanation of the share price variation than the earnings after the goodwill amortization. Goodwill impacts also the stock price, but some financial outcomes are more relevant for the stock pricing. Besides, goodwill impairment is considered by rating agencies in their rating methodology (Sun & Zhang, 2016, p. 2). They take also into account the financial profile and the governance in their rating methodology. Goodwill impairment is perceived as a negative event in the investment decision process (Sun & Zhang, 2016, p. 4).

2.2.1. Market reaction

According to Brealy & Myers (1988, cited in Woolridge & Snow, 1990, p. 354), the market value of a firm is the sum of the discounted value of future cash flow generated from assets in place and the net present value of expected cash flows from investment opportunities that are expected to be accessible and used by the firm in the future.

The stock market reaction can give a gauge, whether the merger creates or destructs value for the shareholders (Andrade et al., 2001, p. 109). This is efficient in a capital market due to public information. As a result, the stock price quickly adjusts after a merger is announced. The advantage of using stock market data is that it is on the one hand an independent assessment of the effects of the merger and on the other hand it is easily observable (Duso et al., 2007, p. 462). In case that the acquirer has still potential for growth and has the possibility to transfer this growth possibility to the target firm, it has also impact on the market reaction on the announcement date (Tanriverdi & Uysal, 2015, p. 152). Another aspect that has positive impact on the market reaction of acquisitions is, if the acquirer uses a top tier investment bank with experience in M&A and international presence for the acquisition (Humphrey-Jenner et al., 2017, p. 1691). Mergers and acquisitions that are announced in times the market is up, have normally a better market reaction than mergers that are announced when the market is down (Krishnan & Satish, 2016, p. 1267; Rosen, 2006, p. 989). Even that some evidence shows that mergers in times the market is up lead to a decline in stock price in the long-run. This is, because of over optimism of the managers in hot market times (Krishnan & Satish, 2016, p. 1267). The positive effect on the stock price in hot markets results from the fact that in these times investors are also over optimistic (Krishnan & Satish, 2016, p. 1267). Statistically, over confidential CEOs proceed more acquisitions than rational CEOs. However, this does not mean that over confidence of a CEO can predict a negative market reaction to a merger, but on average the created value is lower for over confident CEOs (Malmendier & Tate, 2008, p. 23). The market reactions of merger announcements depends mainly on the information that is contained in the announcement, but also on the potential synergies that the bidding company could capture for its shareholders (Krishnan & Satish 2016, p. 1268). Furthermore, the market reactions to a merger are positively correlated with the response to other recent mergers (Rosen, 2006, p. 989; Kumar et al., 2015, p. 2111). According to Jain and Sunderman (2014, p. 828), the market is already reacting to the merger before the first public announcement of the initiated acquisition.

According to Kumar et al. (2015, p. 2113), the market reaction has such a big impact on the decision of managers that if the reaction is too bad, managers cancel their plans for acquisitions. In contrast to this states Luo (2005, p. 1970) that even, if the market reaction is bad, most mergers still happen. As a reason for this, Luo says that companies
have to pay too high fines, if they cancel the acquisition plans. Market reactions have not only impact on the wealth of shareholders, but also on the wealth of the managers. The impact comes not only in form of value decrease of the shares, the managers are holding, but also through other mechanisms like compensation adjustments (Kumar et al., 2015, p. 2114). Resulting from that, managers have a personal interest that the market reaction is not bad, but positive, since otherwise they would lose larger amounts themselves (Kau et al., 2008, p. 350). Furthermore, CEOs’ that proceed with value reducing acquisitions have a higher chance of being replaced than CEOs’ that cancel such value decreasing acquisitions (Lehn & Zhao, 2006, p. 1809). In order to avoid a bad market reaction, managers often withhold bad information and leak good information early (Kothari et al., 2009, p. 273). Moreover, if a merger is announced on a Friday, the market reaction is much lower than if the announcement happens on any other weekday (Lois & Sun, 2010, p. 1792).

Studies find that instead of taking place individually, merger and acquisitions happen often in waves (Hou et al, 2015, p. 140). While these take place, large amounts of capital are transferred through the economy (Park & Town, 2014, p. 548). Moreover, these waves are clustered by industry (Moran, 2017, p. 174). Some theories say that merger waves take place in response to industry shocks (Park & Town, 2014, p. 548). According to Mitchell & Mulherin (1996, p. 196), shocks are accompanied by a change in technology, government policy, or demand or supply conditions. However, the shock and changes in these factors alone are not enough in order to cause merger waves, but there has also to be sufficient liquidity to accommodate the asset reallocation (Harford, 2005, p. 530). Furthermore, additional requirements stated by Harford (2005, p. 530) are that both, an economic motivation for transactions and relatively low transaction costs in order to generate many transactions, have to be fulfilled. After stating all those requirement, it has to be said that these are all theories, since in the literature there is still no consensus about why merger waves happen (Harford, 2005, p. 532). Other theories for example state that merger waves occur, because managers want to take advantage of temporary market misevaluation (Rhodes-Kropf & Viswanathan, 2004, p. 2710).

The market reaction to a cash merger has a higher likelihood to be positive than the reaction to an equity merger (Rhodes-Kropf & Viswanathan, 2004, p. 2710). The reason for that is that the bidders’ expectations are more often fulfilled by using cash as form for the acquisition payment instead of using equity (Emery & Switzer, 1999, p. 84). In contrast to the market reaction for the acquirer, it has also to be said that in most acquisitions the shareholders of the target company have even a larger gain than the shareholders of the bidder company (Danbolt, 2004 p. 104).

### 2.2.2. Market efficiency/ effective market efficiency

According to Fama (1970, p. 383), an ideal market is, if its prices give signals for resource allocation. For that, the prices at the market have always to fully display all available information. In this case the market can be called “efficient” (Fama, 1970, p. 383). As soon as information is available, it is incorporated into the prices at the market without any delay (Malkiel, 2003, p. 59). An efficient market can be defined as “a market, if there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants” (Fama, 1995, p. 76). Resulting from that, in an efficient market no trader has an information
advantage over another trader (Brown, 2011, p. 82). Additionally, it is to say that the market absorbs information in a few minutes and within these minutes the new information is incorporated in the market price (Patell & Wolfson, 1984, p. 249).

The competition in efficient markets has the result that information about past events, but also information about expected events in the future, are incorporated in the prices (Fama, 1995, p. 76). Altogether, there are three types of information that are included in the market prices according to the efficient market hypothesis: historical information, public information, and future information (Eom et al., 2008, p. 4630). From these three kinds of information the future information has the biggest impact on market prices according to the efficient market hypothesis (Bollen et al., 2011, p. 1).

The efficient market hypothesis is linked to the “random walk” theory (Malkiel, 2003, p. 59). According to Cheng and King Deets (1971, p. 11), the random walk theory is on the other hand divided into two distinct hypotheses: an economical hypothesis and a statistical hypothesis. The economical hypothesis assumes that all security markets are efficient markets and resulting from that the possibility for investors to earn systematically superior is not given. In contrast to this assumes the statistical hypothesis that all price changes are independent random variables (Cheng & King Deets, 1971, p. 11).

All in all, the theory of random walk states that the price of stocks at the current market is independent and unrelated to previous market-price paradigms (Van Horne & Parker, 1967, p. 87). That means that it is impossible to forecast future market prices based on the price patterns in the past.

Some critics say about the efficient market hypothesis that it is not as efficient as it is suggested. For example, Gilson and Kraakman (2014, p. 373) state that information is not as fast incorporated, as it would be needed in order for the market to be efficient. Moreover, they say that sometimes some information is not even integrated in the market price. Another critic mentions that the market is only efficient, if all traders are rational. That is, because then all traders act as “one driver”, but in case some trader are biased, a “second driver” enters the market and this has the result that the market become less efficient (Odean, 1998, p. 1891). Also, Grossman and Stiglitz (1980, p. 404) argue that if the efficient market hypothesis would be true, it would be impossible for informed traders to make any profit with their information.

### 2.2.3. Agency Theory

The agency theory defines the relationship between the principle, who is the owner of the company, and the agent, who is the person that manages the company in the name of the principle (Eisenhardt, 1989, p. 58; Bosse & Phillips, 2016, p. 276). The principle engages the agent for work on behalf of the principle and in return for this work the principle pays compensation to the agent (Kivistö, 2005, p. 1).

According to Eisenhardt (1989, p. 58) the main concern of the agency theory are two problems: First, the conflict between the different goals of principle and agent and in this aspect the expensive verification about what the agent is actually doing. And the second concern is the risk sharing between agent and principle in case both parties have different positions towards risk. These problems exist, because of the information asymmetry between both parties (Bosse & Phillips, 2016, p. 276). However, these
problems are related to adverse selection and moral hazard (Kambright, 2009, p. 209). Adverse selection means that some information is hidden. This occurs often before creating a contract and bases on the uncertainties of the agents’ preferences (Rauchhaus, 2009, p. 872). Moral hazard on the other hand means hidden action. This often happens after the contract is in place and results that the principle is not able to observe the actions of the agent (Rauchhaus, 2009, p. 872).

The main focus of the agency theory is to establish the best contract to govern the relationship between principle and agent (Eisenhardt, 1988, p. 490). Therefore, the agency theory defines mechanisms that could reduce the agency loss. Examples of these mechanisms are incentive schemes. These schemes typically align the financial interests of the executives with those of the shareholders (Donaldson & Davis, 1991, p. 50). In order to align the interests, the schemes try to split the risks between the agents and the principle that, if the agent is performing badly, the agent will also bare the results of this bad performance (Rungtusanatham et al, 2007, p. 117). The downside of the compensation schemes is that managers want to acquire other companies in order to on the one hand increase their compensation and on the other hand to maximize their power. By doing that they increase the company often beyond the optimal size (Jensen, 1986, p. 323).

Agency costs are a sum of three different costs. First, the expenses of the principle for monitoring the agent, second, the bonding costs of the agent, and third, the residual loss (Williamson, 1988, p. 572). Jensen (2004, p. 553) argues that especially an overvaluation of a company can be harmful, since it also increases the equity-based compensation of managers and board members. After some time, the managers will realize that it will be difficult to deliver the expectations that come with the overvaluation and managers start gaming. Furthermore, companies in which the agency costs are lower, are statistically experiencing more often earnings management (Jiraporn et al., 2006, p. 623).

The agency loss describes the amount that is lost by the agents in comparison, as if the principles would exercise direct control of the company (Donaldson & Davis, 1991, p. 50). Estimations of the costs of the agent problem at large manufacturing firms are between 0.2 and 5 percent of the revenues (Bosse & Phillips, 2016, p. 276). In addition to that, the agency theory assumes that people are self-interested, rational and risk-averse (Eisenhardt, 1988, p. 491; Daily et al., 2003, p. 372).

2.2.4. Earnings management

Earnings management can be defined as following: “Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers” (Healy & Wahlen, 1999, p. 368). As stated in this definition, earnings management means that managers alter financial reports with the intention to mislead specific parties. The possibility of earnings management depends on the freedom that accounting standards are granting the management in accounting estimates (Onesti & Romano, 2013, p. 57). According to Leuz et al. (2003, p. 521), the investor protection plays a big role in regard to which extend earnings management is happening in a company. This results from the fact that with better investor protection,
insiders experience fewer private control benefits and therefore they have less motivation to mislead investors.

A reason why companies are performing earnings management is to avoid the reporting of decreasing earnings, hence companies that do so experience normally negative abnormal stock returns (Burgstahler & Dichev, 1997, p. 100). Another reason is to absolute and relative losses of the company (Burgstahler & Dichev, 1997, p. 124). Additional reasons for earnings management are influencing the stock market, increasing management compensation, decreasing the chance of violating lending agreements and avoiding intervention from the governmental side (Sevin & Schroeder, 2005, p. 48).

Accounting done according to IFRS is considered to report investor orientated. That means that companies adopting IFRS often show less earnings management than before (van Tendeloo & Vanstraelen, 2005, p. 159). But to which extent earnings management is applied depends not only on the report method, but also on how much the regulations are enforced in the specific country. According to Moratis and van Egmond (2018, p. 2), earnings management can be divided into two different types: accrual-based earnings management and real earnings management. Accrual-based earnings management on the one hand consists of changing the accrual part of earnings while not causing real economic effects. Real earnings management on the other hand implies that the management of companies modifies business action and with it causing real economic consequences (Moratis & Edmond, 2018, p. 2). Since the write-off method of goodwill was changed from amortization to impairment, it is criticized that it can be used for earnings management (Pajunen & Saastamoinen, 2013, p. 245). On the one hand, the management can decide not to impair the goodwill, but on the other hand, it can use the impairment loss as an earnings bath in times of low profitability (Pajunen & Saastamoinen, 2013, p. 255). An earnings bath describes a situation in which a company lowers its earnings with the intention to increase the likelihood of future profits. Since the introduction of the impairment method, the writing-off of goodwill requires a certain amount of judgment. This gives management some flexibility in writing-off the goodwill and therefore it can increase earnings management (Zang, 2008, p. 39).

### 2.2.5. The value relevance of accounting information

Financial statements are prepared in order to communicate information for external users like investors, lenders or other creditors (Higgins, 2012, p. 3) in order to help them making thought investment decisions. Because the world is globalized and there are differences in the requirements for preparing the financial statements, the International Accounting Standards Board (IASB) aims to narrow these differences and to harmonize financial statements reporting between the countries. IASB developed in this purpose the conceptual framework (IFRS, 2017a). This conceptual framework has 3 qualitative characteristics. It must be relevant, which means that the financial statements have to be capable of making a difference in the users’ decisions. It must not be material: if there are misstatements they must not affect the users’ decisions. And, financial statements must be a faithful representation of the economic reality: to be a faithful representation, they must be complete, neutral and free from error. The conceptual framework has also 4 enhancing qualitative characteristics: comparability, verifiability, timeliness and understandability (IFRS, 2017).
Information has valuable relevance, if there is a correlation between its use by investors in order to value a firm and its stock price (Wyatt, 2008, p. 217). Beside the difficulty, to measure reliably of the research and development costs in order to make it being relevant information, other intangible assets like goodwill, brands or customer loyalty are in the same situation (Wyatt, 2008, p. 217). The ability to measure reliably information is also linked with its value relevancy. Lev and Zarowin (1999, p. 383) find that the usefulness of financial information has decreased over 20 years. Indeed, stock prices and key financial information, like earnings cash flows, and book value, are less correlated. This lack of usefulness is due to the change of business condition and the inability of the accounting standards to translate these changes. It is especially the case for intangible assets (Lev & Zarowin, 1999, p. 383; Francis & Schipper, 1999, p. 323). Truly, financial statements have mainly lost their relevance for high-tech companies; the reporting standards fail in the recognition of intangible assets generated by cash burning R/D programs (Francis & Schipper, 1999, p. 342). In most developed countries the economy shifted from a tangible to an intangible intensive profile (Ciftci et al., 2014, p. 199). Value relevance of intangible industries financial statements is lower than the value relevance for tangible industries (Ciftci et al., 2014, p. 224). Valuation of intangible assets is at stake in our economy, because it is important for a lot of investment forms like corporate venture capitalism and venture capitalism (Wyatt, 2008, p. 218).

Financial statements have also lost their main relevance to their users (Francis & Schipper, 1999, p. 319). Audited financial statements lost their relevance, because the reporting model has evolved in a way that does not communicate relevant information (Francis & Schipper, 1999, p. 323). The net income results from the addition of different components that are not homogenous (Ball & Brown, 1968, p. 159). Net income is an outcome that is used by investors; they think that it is relevant. The net income contents at least 50% of the information contained in the financial statements. Nevertheless, most of the information is not communicated through the annual report, but through other media like interim reports. Indeed, they allow a better timely analysis. Kane et al. (2015, p. 190) find that the book value of equity and earnings are relevant information in investors’ decision process especially during crisis.

### 2.3. Mergers and acquisitions

With the globalization, companies have the opportunity to grow externally on new markets with the help of cross border mergers and acquisitions. (Mario et al. 2001, p. 557)

#### 2.3.1. The logic behind these operations

Acquisitions aim to get synergies and to redirect resources (Svetina, 2012, p. 537). Even that each M&A operation has a different reason, the main reason for mergers and acquisitions is to get synergies (Mukherjee et al., 2004, p. 8). To value a target, CFOs are more using the discount cash flow methods than the multiple methods (Mukherjee et al., 2004, p. 7). Companies are diversifying themselves in order to reduce their potential losses during an economic crisis (Mukherjee et al., 2004, p. 18). If public companies want to acquire a target only because of the potential synergies, then they should pay more than private equity firms. Indeed, their pricing strategy will depend on the present value of the synergies (Svetina, 2012, p. 537). Therefore, the acquirer pays often a
premium. The premium is the cash or securities that are paid in excess of the target’s value and that is justified by the potential synergies (Nielsen & Melicher 1973, p. 139).

Using mergers and acquisition as a development tool is risky, because of the high failure rate (Kreitl & Oberndorfer, 2004, p. 691). In the engineering consulting sectors, firms are merging in order to diversify and enter or to consolidate their position in their markets. This diversification is geographic as well as technologic. This strategy aims to increase the company market shares and to accelerate the firms’ growth. The risk in a M&A appears one year before the transaction. This risk is decreasing over time (Chang & Cho, 2007, p.257). However, the risk distribution is not always the same. In fact, when a company chooses to merge for customers’ reasons, the risk is persisting after the merger. Whereas, for other M&A justifications, the post-merger risk is decreasing (Chang & Cho, 2007, p. 261).

M&As can create value through efficiency gains, the access to a broader market, and the market for corporate control. However, such deals can potentially destroy value as well, because of the agency costs, the free cash flow, the management entrenchment, managerial discretion and managerial hubris (Sehleanu, 2015, p. 600).

2.3.2. Key success factors of a M&A deal
A merger success depends on pre- and a post-merger strategy. The merger must fall within a strategy. Before the acquisition the acquirer has to think about the target and the way it will be integrated in the future group. The acquirer must also think about the payment and the post-acquisition reaction by preparing the communication related to the acquisition. Then, the post-merger key success factors are: integration strategy, post-acquisition leadership, the speed of implementation, the post-merger–integration team and disregard of day-to-day business activities, the communication during the implementation and, managing corporate and national cultural differences (Gomes et al., 2013, pp. 17-19). M&A deals are more likely to happen between firms that have the same economic profile (Hoberg & Phillips, 2010, p. 3775). This effect might be caused by an “asset complementarity effect”. Truly, it is easier for companies that are similar to create synergies. This similarity impacts positively the financial outcomes, especially when it is about the introduction of new products on the market (Hoberg & Phillips, 2010, p. 3775). In the end, a deal between two likewise companies increases their potential to outperform their peers.

The mergers market is impacted by the industry concentration (Geiger & Schiereck, 2014, p. 27). The capital market reaction about a merger depends on the target’s health, the acquirer health and their competitor’s health (Geiger & Schiereck, 2014, p. 27). The more the industry is concentrated, the more it is motivated by production gains. Value creation in an M&A depends mainly on the industry conditions. Then, M&As are seen as a consistent way to restructure a business and to create value, as the target shareholders realize on average an abnormal return of 20.45% between 35 days before and 5% after the deal (Huyghebaert, & Luypaert, 2012, p. 1832).

2.3.3. Value creation and stock price
The stock market often reacts to M&A deals. This is due to the fact that such a deal will modify the factors that determine a stock price like the earnings of a company and the associated ratios. Analysts and salesmen look positively to the following items in an
M&A deal: “product line compatibility, earnings growth rate, balance sheet impact, sales growth rate, the reputation of the acquisition candidate, and the management computability” (Balog, 1975, p. 24). Then, they look in a negative way to the following items: “earnings growth rate dilution, earnings per share dilution, product line incompatibility, balance sheet degradation, margin deterioration, sales growth rate dilution and reputation of the acquisition candidate” (Balog, 1975, p. 25). To improve the market reaction managers must communicate about their growth plan, their strategy, and their resource management (Balog, 1975, p. 26). Companies that enjoy an overvalued stock price have an advantage in their acquisition strategy. In fact, they have a higher ability to acquire targets due to their high-priced shares. Moreover, they are more likely to survive and grow than companies with an undervalued stock price, which have a high chance of becoming targets (Shleifer & Vishny, 2003, p. 309).

Value creation in an M&A depends mainly on the industry conditions. Then, M&As are seen as a consistent way to restructure a business and to create value, as the target shareholders realize on average an abnormal return of 20.45% between 35 days before and 5% after the deal (Huyghebaert, & Luypaert, 2012, p. 1832). In Canada between 1980 and 2000, acquirers had a lower “three-year post acquisition returns” than their peers on an scaled equity basis. Cross border acquisitions have a poor performance in the long term. Then, the payment method impacts the return too, M&As that are cash financed outperform those that are equity based financed (André et al, 2004, p. 41). The value creation analysis of an M&A deal must be different, if a company is listed or not (Latorre et al., 2014, p. 1075). Acquirers of private firms earn on average higher abnormal returns than acquirer of a public firm, which are insignificant in the last case. In an M&A deal the stock performance on the short term is as important as the stock performance on the long-term (Hazelkorn et al, 2004, p. 82). Everything is about value creation in these deals. After an acquisition the acquirers’ share loses on average 0.5% to 0.7%. Despite that, the market reacts more positively to the acquisition of a more mature target. The acquisition of a foreign company is seen as a strategic operation and creates more value than a domestic deal (Hazelkorn et al, 2004, p. 82).

2.4. Summary

One of the first times goodwill was mentioned in history was in the 19th century, where it was defined as the excess profits that arise from different sources and reasons (Courtis, 1983, p. 2). Over the time, the definition of goodwill developed (Miller, 1973, p. 285), since it reached a higher level of importance (Ratiu & Tudor, 2013, p. 138). According to Ratiu & Tudor (2013, p. 147), goodwill is divided into three types: positive goodwill, negative goodwill and internal generated goodwill. Positive goodwill comes from synergies, negative goodwill from a bargain purchase and internally generated goodwill is not recognized by the accounting standards (Ratiu & Tudor, 2013, p. 143). The accounting standards define two ways for recognizing goodwill (IFRS 3, 2017, para. 19): The “full goodwill” method, which includes minority interests and the “partial goodwill” method that takes only the majority’s share of goodwill into account. With the implementation of IFRS 3, the writing-off method of goodwill changed from amortization it to impairment (Mario et al., 2011, p. 560). Furthermore, goodwill has to be recognized at fair value. The reason for this shift is that the amortization included no little information for the user of financial statements (Mazzi et al., 2016, p. 356). With the impairment method companies must test goodwill each reporting period for impairment (IAS 36, 2017, para. 9). The basis of these impairment tests is based on subjective of the management, what results in difficulties to confirm the assumptions.
and estimations (Knauer & Wöhrmann, 2016, p. 421). On the other hand, the stated goodwill is more aligned to the real economic performance (Wines et al., 2007, p. 868). In contrast to impairment losses of other assets the impairment loss of goodwill is permanent and cannot be reversed (Lhaopadchan, 2010, p. 123). That has the result that some companies postpone the impairment of goodwill (Knauer & Wöhrmann, 2016, p. 422). The impairment of goodwill is associated with good governance and the willingness of managers to communicate information and about the future performance of the firm (AbuGhazaleh et al., 2011, p. 196). Goodwill impairment is negatively correlated to companies’ performance (Glaum et al., 2015, p. 32). Furthermore, companies are more willing to impair goodwill, if the firm is located in a country with a strong enforcement system (Glaum et al., 2015, p. 33).

Before the adoption of IFRS 3, stock prices were negatively impacted by the amortization of Goodwill in both, the short- and long-term (Cheng et al., 2017, p. 327). With the impairment method, the stock price is negatively impacted in the short-term, but positively in the long-term (Cheng et al., 2017, p. 328). After the change to impairment method for goodwill, it is criticized for being used in order to perform earnings management (Pajunen & Saastamoinen, 2013, p. 245). This is possible, because of the information asymmetry, which is described by the agency theory. According to the agency theory, the management has different goals than the management and tries to reach them with the advantage of the information asymmetry (Eisenhardt, 1989, p. 58; Bosse & Phillips, 2016, p. 276).

The stock market reaction can give a gauge, whether the merger creates or destructs value for the shareholder (Andrade et al., 2001, p. 109). The advantage of using stock market data for this is that it is as well an independent assessment of the effects of the merger as it is easily observable (Duso et al., 2007, p. 462). That is, like the efficient market theory says, because all available information, from the past, present and future, are already incorporated in the stock price (Malkiel, 2003, p. 59; Eom et al., 2008, p. 4630). The market reaction is affected in the case that the acquirer has still potential for growth and also can transfer this potential to the target company (Tanriverdi & Uysal, 2015, p. 152). The market reaction has big impact on the decision of managers to proceed the take-over that some managers cancel their plans for acquisitions (Kumar et al., 2015, p. 2113). This is, because the market reaction has not only impact on the wealth of shareholders, but also on the wealth of the managers (Kumar et al., 2015, p. 2114).

Most mergers happen not alone, but in merger waves (Hou et al., 2015, p. 140). Some theories say that merger waves are an answer to industry shocks (Park & Town, 2014, p. 548). The aim of acquisitions is, to get synergies and to redirect resources (Svetina, 2012, p. 537). On the other hand, M&As are risky, because of high failure rates (Kreitl & Oberndorfer, 2004, p. 691). Therefore, M&A deals are more likely to happen between companies with a similar economic profile (Hoberg & Phillips, 2010, p. 3775). Additionally, companies that have a high stock price have the advantage that they are more likely to survive and have also benefits in their acquisition strategy (Shleifer & Vishny, 2003, p. 309).

### 2.5. Hypotheses

In order to help answering the research question, six sub-hypotheses were developed. They were evolved based on the literature review and the research framework. The first
sub-hypothesis assumes that the market reaction to an acquisition announcement can predict the goodwill impairment one year after the acquisition (H1). This hypothesis comes from the fact that financial markets evaluate potential value creation (Andrade et al., 2001, p.109) and reacts according to this evaluation (Duso et al., 2007, p.462). Besides, they are reacting to goodwill impairment and it is perceived as an acknowledgement of a value destruction investment decision. Resulting from the fact that it could be possible that the market reaction could be used to predict the impairment one year after the acquisition, but also for predicting the impairment in the second year (H2). These two first hypotheses lead to the third one that the first year impairment predicts the impairment in the second year (H3).

Based on what was found in the literature review that financial and non-financial companies pay differently for synergies and therefore acquire different amounts of goodwill, the fourth hypothesis is formed. Our fourth hypothesis is the following: “The industry sector could be used to predict goodwill impairment (H4).” According to Geiger and Schiereck (2014, p.27), investors’ reaction depends not only on the potential of the new perimeter of the acquirer. It also depends on the industry conditions, since it impacts the success of a deal. Then, financial companies, like private equity firms, are willing to pay less for a target than a non-financial company that is aiming for synergies and competitive advantages (Svetina, 2012, p.537).

Book value of equity and earnings is important for financial analysts in their investment decision process (Kane et al., 2015, p.190). If the acquirer has the control over the target, it has to consolidate its balance sheet (IFRS 10, 2017). Our fifth hypothesis aims to investigate if the variation of the financial structure, calculated with the leverage, could predict goodwill impairment (H5). This hypothesis lead us to the sixth one. Its purpose is to examine if the goodwill could be predicted according to the deal value (H6).
3. Scientific methodology

In this section, the adopted philosophical point of view is discussed through the presentation of the epistemological and ontological posture. At the end, the research approach is presented.

3.1. Ontology

Saunders et al. (2009, p. 597) defines ontology as a “branch of philosophy that studies the nature of reality or being.” Bryman (2011, p. 64) defines it more accurately, according to him ontology refers to the question regarding social entities, art, and nature: should social entities be analyzed as objective entities or as socially constructed entities. Ontology is divided into two aspects (Bryman et al, 2011, p. 64): Objectivism and constructionism.

Objectivism assumes that social entities can exist in reality external to social actors (Saunders et al., 2009, p. 110). According to Bryman et al., (2011, p. 64), these social entities confront everyone as external facts and are beyond everyone’s reach or influence. However, objectivism believes that humans are imperfect and can only understand the world around them through systematic investigations (Rosa, 1998, p. 18). Moreover, it considers that social and natural reality exists independently before human cognition (Brannick & Coghlan, 2007, p. 62). Furthermore, in the objectivism assumption, organizations are treated as a tangible object (Bryman et al., 2011, p. 64). People are working there and tend to adopt the views of the organization, but the organization also limits the individuals working there.

Constructionism is the other ontology aspect. In contrast to objectivism it assumes that social phenomena and their meanings are continuously realized by social actors (Bryman et al., 2011, p. 65). According to Neuman (2003, in Tuli, 2010, p. 101), constructionism assumes that reality is a product of social processes. In other words, it is considered that reality is an output of the cognition process of humans (Brannick & Coghlan, 2007, p. 62). Resulting from that, individuals perceive different situations in different ways, since they have their own idea of the world (Saunders et al., 2009, p. 111). The task of the researcher is to understand the view of the individuals in order to understand their motives. However, the constructionism position believes that knowledge is indeterminate (Bryman et al., 2011, p. 65).

For our study we considered objectivism as ontological consideration. This is, because this research aimed to investigate the impact, which the market reaction of acquisitions has on the goodwill impairment based on a quantitative study. Here we analyzed, what impact the social entity (the acquiring company) has on the social actors (management). Since the outcome of this research is not depending on who is conducting it, it clearly can be categorized as an objectivism consideration.

3.2. Epistemology

Epistemology is about what type of knowledge could be considered as acceptable in a selected field of study (Saunders et al., 2009, p. 112). For positivist researchers the only knowledge that is acceptable is the one that comes from an objective evidence, and an observable and measurable phenomenon. To reach that outcome, the positivist describes and explores in-depth phenomena from a qualitative point of view (Crossan, 2003, p.
According to Smith (1998, p. 77), positivism approaches assume that things can be studies as hard facts.

In the contrary for interpretivist researchers’ acceptable knowledge comes from subjective evidence, the researcher is closer to the phenomena and impacts him (Saunders et al., 2009, p. 116). Moreover, the interpretivist researcher believes that many aspects of the complex world are lost, if it is reduced to some law-like generalizations. For this kind of research, it is important to understand the social roles of humans. That means that the research is rather conducted among humans than objects (Saunders et al., 2009, p. 116).

For the pragmatic assumption, the acceptable knowledge depends mainly on the research question; researchers can choose either observable phenomena or subjective meanings (Saunders et al., 2009, p. 109). However, the outcome of the research should be positive within the researchers’ value system (Tashakkori & Teddlie, 1998, p. 30).

For the positivist assumption researchers are only allowed to look for observable phenomena and must focus on causality and law-like generalizations. For the realist assumption, researchers must focus on observable phenomena that provide credible data and facts. They must be aware of the data sufficiency. They have to focus on explanations within a context (Saunders et al, 2009, p. 114). Here is also important to mention that the realist position can be divided into two different assumptions: the direct realist and the critical realist (Saunders et al, 2009, p. 115). For the critical realist there are two steps: First, there is the object and the event that takes place and following this, the mental process that after it meets the sense. In contrast to this, the direct realist believes that there is only the first step (Saunders et al., 2009, p. 115). For the interpretivist paradigm subjective meanings and social phenomena are considered as an acceptable knowledge. Researchers must focus on details of situations and the motivation of the actors (Saunders et al., 2012, p. 115).

In addition to the three main positions of epistemology, interpretivism, positivism, and realism, one can also adopt pragmatism, which adopts multiple epistemological positions (Saunders et al., 2009, p. 109). This is supported by authors such as Van de Ven and Poole (2005, p. 1393-1394), who argue that even though different approaches or views regarding epistemological or ontological standpoints may seem competing or opposing, they should be interpreted rather as being complementary. Pragmatism is often preferred in mixed-method studies conducted with both a qualitative and quantitative method (Saunders et al., 2009, p. 109). This is derived from the epistemological position saying that the most important determinant of the research philosophy should be the research question (Saunders et al., 2009, p. 598).

For this research the positivism perspective was applicable, since the aim of it is to generalize the outcomes to other companies. The data that was collected for this research is observable and measurable. It is not relying on subjective evidences. Moreover, the research focused on the causality between the impairment of goodwill and the after-acquisition market reaction. Based on this causality, the result is a generalization that can be adopted to other companies that are comparable. To be able to generalize the outcomes, 43 companies from Denmark, Finland, Norway and Sweden were taken as a representative sample for acquiring companies that acquired another firm around the G20 countries between 2011 and 2014.
3.3. Research approach

For the research approach it has to be decided, whether a deductive or inductive research is conducted (Saunders et al, 2009, p. 124). The deductive research is concerned with conclusions from premises or propositions. If the deductive approach is used by a researcher, first a conceptual and theoretical structure has to be developed. After that, this structure is tested with the help of empirical observations (Collis & Hussey, 2014, p. 7). That means that by using the deductive approach, the researcher concludes particular instances from general inferences (Collis & Hussey, 2014, p. 7). In other words, the researcher first develops a theory and following this a hypothesis is deducted from this theory. Based on observations, the hypothesis is either confirmed or rejected (Saunders et al., 2009, p. 125). According to Bryman et al. (2011, p. 56), the deductive approach first seems to be very linear, but it includes occasions, where it is not the case. Another aspect of the deductive approach is that it has to be generalizable (Saunders et al., 2009, p. 125). Therefore, the sample size needs to be of sufficient numerical size.

The inductive approach on the other side is the opposite of the deductive approach. By using the inductive approach, a researcher develops a theory based on observations of empirical reality (Collis & Hussey, 2014, p. 7). Instead of developing and using a theory from the beginning, it is the result of the inductive approach (Bryman et al., 2011, p. 57). First, the object of research is observed. Then the researcher analysis the results for patterns and regularities. These form the basis for a hypothesis and, in the end, the researcher formulates a general theory (Saunders et al., 2009, p. 125). Researchers that are following the inductive approach are more likely to use qualitative research and also to have a relatively small sample size (Saunders et al., 2009, p. 126). The reason for the small sample size is that with the inductive approach, researchers intend to investigate the context of particular events.

Hence this thesis started with the theory instead of developing an own theory by conducting research, the deductive approach was used. Along with this, the aim of this research was that the outcome could be generalized. Before any data was collected, the literature was reviewed and based on this the research question and six hypotheses were formed. With that the data was collected and a generalizable result was the outcome. All these steps were steps of a deductive approach and therefore, this study can be considered as a deductive one.
4. Practical methodology

This chapter is dedicated to the practical methodology that is induced by the adopted paradigm. It describes the data collection method and analysis. This chapter closes with ethical considerations.

4.1. Axiology:
Axiology can be defined as the branch of philosophy that is concerned with the judgment about values (Saunders, et al., 2009, p. 115). Values are important in the research process, since they are the image of the researcher’s beliefs (Bryman & Bell, 2011, p. 29). Indeed, our values have an impact on the research process. According to Bryman & Bell (2011, p. 30), values and beliefs like “choice of research area, formulation of research question, choice of method, formulation of research design and data collection techniques, implementation of data collection, analysis of data, interpretation of data and conclusion”. However, positivism is seen as value-free. Positivist scholars are looking for relationships and agree about the fact that their study is not impacted by their research activity (Collis & Hussey, 2014 p. 48). According to Collis & Hussey (2014, p. 48), these assumptions are not right for the social sciences. Undoubtedly, different studies have demonstrated that research impacts scholars and participants.

Our topic choice was influenced by our accounting courses and the economic. We highlighted business combinations and their accounting treatment and the impairment in our accounting class. The economic news influences our choice and our perception of our topic, because we read different interpretation of this every day. Moreover, our data collection method is not neutral, instead we chose the method that is in our mind the best in term of data retrieving. In fact, we have a non-probability sample and there is a risk that our judgment impacted our selection process (Bryman & Bell, 2011, p. 177). Being conscious of these phenomena, we tried to take a step back when we had to make a choice and to think about all possible solutions.

4.2. Research design
The research design is “the detailed plan for conducting a research study” (Collis & Hussey, 2014, p. 344). Research design can also be defined by the methodological choices made in order to answer the research question (Collis & Hussey, 2014 p. 59). There are two main research strategies: quantitative and qualitative research strategies. To choose between them, scholars must refer to their ontology and epistemology.

Quantitative research strategies are used under positivist paradigm. Such a strategy aims to test one or more hypothesizes in the study of the literature against empirical evidence (Collis & Hussey, 2014 p.51) based on numerical measurement (Zikmund et al., 2013, p. 134). In this type of study, it is important to identify and then to collect all the key variables. One key success factor of this research strategy is the reliability of the data. To be reliable, they have to be “highly specific and precise” (Collis & Hussey, 2014, p. 52).

Qualitative research strategy is used under the interpretivist paradigm. Its aim is to draw a pattern perceived with the data and then to build an explanatory theory. As the aim of
this paradigm is to construct a theory, there is no intention to analyze data statistically (Collis & Hussey, 2014, p. 52). Under the interpretivist paradigm, data must be rich, well detailed, nuanced and with a high quality in order to study deeply a phenomenon. Our study aimed to explore the relationship between stock prices and goodwill impairment. Since we defined our study as a positivist study, we agreed on the fact that we have to pursue a quantitative study. According to our epistemological stance of positivism, we pursued a panel study.

The panel of this study was constructed by multiple companies followed over two years. Moreover, it was constituted by financial and non-financial companies. This study was also a longitudinal study, since, according to (Collis & Hussey, 2014, p. 343), a longitudinal study is “a methodology used to investigate variables or group of subjects over a long period of time”. The main advantage of this research design is to analyze a phenomenon and its changes over a long period (Collis and Hussey, 2014, p. 64). Nevertheless, this type of study is time consuming, costly and there is a risk to lose some participants. To lower this risk, secondary data can be used. A panel was used in this study. Panel studies are one type of longitudinal studies. It is selected at two occasions and from the same geographic region (Bryman & Bell, 2011, p. 58).

4.3. Literature search

Literature is an important part in our degree project, since it allows us to identify what is relevant for this degree project. Indeed, it helped us narrowing our topic and to find the literature gap. Moreover, the existing literature helped to get a better grasp about a subject and to identify used methodologies (Collis & Hussey, 2014, p. 76).

Our literature review is characterized by the fact that we did not only look for information directly linked to our topic. We chose to follow this method in order to broaden our knowledge and to have an as objective degree project as possible. Furthermore, in our literature review, we used primary sources, especially for the accounting guidance. Secondary sources were used to have an overview of the current state of the research that has already been conducted about our topic. Primary data is defined as “the first occurrence of a piece of work” (Saunders et al., 2009, p. 69). “Secondary literature sources such as books and journals are the subsequent publication of primary literature” (Saunders et al., 2009, p. 69).

According to Collis & Hussey (2014, p. 76), relevant sources for our degree project could be found on databases, books, articles, conference, papers, reports, professional journals, newspapers, statistics and industry data. We chose to use mainly peer-reviewed articles in order to have information of sufficient quality. We collected most of our sources on the Internet. They were downloaded from the database EBSCO provided by ICN Business School and Umeå University, or Google Scholar. In addition to peer-reviewed articles we used the IFRS.

To find our sources, initially, we looked for articles by using for example the following keywords: “goodwill”, “impairment”, “amortization”, “business combination”, “IFRS 3”, “IAS 36”, “M&A”, “M&A motivation”, “M&A effects”, “market reaction”, “stock prices”, “effects”, “Agency theory”. During all our literature search, we improved our research skills, by screening faster the most useful keywords for our research. We
improved also our academic skills by referencing faster our sources and by understanding what is important for our degree project.

4.4. Choice of theories and concepts
According to Saunders et al. (2009, p. 68), there are three types of sources for literature: primary, secondary and tertiary. Furthermore, they state that the purpose of the literature review has the purpose to demonstrate familiarity with research that has already been conducted in regard to this specific topic (Saunders et al., 2009, p. 590). A good research can contribute to the collective understanding. But in order to perform a good research, the researcher needs to understand, what studies have been conducted before and their strengths and weaknesses (Boote & Beile, 2005, p. 3). Other reasons for the literature review are, to avoid approaches that have a dead end, gaining knowledge about methodological approaches or gaining new perspectives (Randolph, 2009, p. 2). A good indicator for a good thesis is, if the literature review shows a grasp of what is going on (Mullins & Kiley, 2002, p. 377).

The first part of the literature review focused on gaining deeper knowledge about goodwill. That meant to explore the history of it and to understand the purpose of goodwill. Also important was to show differences to other intangible assets.

Since this thesis studied the predictability from the market reaction to acquisition about the impairment of goodwill, the impairment has also to be reviewed. In that context to understand the impairment, it had to be analyzed, how the goodwill was treated in the past and why it changed to the method that is used nowadays. Like most things in the world, also goodwill is not without critics. Therefore, the literature about practical issues, but also critics, about goodwill was reviewed.

Coming to the second part of the research: the stock prices. In order to proceed this thesis, the relationship between stock prices and the impairment of goodwill had to be understood. Accordingly, the literature to this topic was reviewed, too. In this context the market reaction to mergers is explained and also, why the market is reacting in the way it is and, what has impact on the reaction. Resulting from that, the market efficiency theory is discussed. It explains different aspects of the market, like that the market is very efficient in adapting the market prices quickly according to new available information. In addition to this theory the theory of the random walk had to be explained. It explains why it is difficult to forecast, how the market will react to new information and why even the best trader can never be completely sure, whether his investment is paying off.

To gain a deeper understanding why managers should impair goodwill differently in case of a certain market reaction to an acquisition, the agency theory was reviewed. This theory analyzes the differences of goals of managers and owners of a company. Also, it gives an idea, why managers would practice earnings management.

In this regard it was important to gain a deeper knowledge about earnings management. Therefore, it is explained, what earnings management is, why it happens and what could lower the chance of it to happen. Since earnings management changes the value of the financial reports published by companies, financial reports were also a topic that had to be reviewed. That means that it is explained what the purpose of financial reporting is,
what makes the information in it valuable and what major changes happened in recent times.

The third part of the literature review concentrates on mergers and acquisitions. This part starts with explaining why M&As happen and what intentions companies are following with them. The review of the literature continues then with the focus on risks and factors for success. This is especially important, since based on the success of mergers this thesis aims to identify, whether the market reaction to M&As can predict the goodwill impairment. Furthermore, to understand what impact acquisitions have on the stock price of companies, it was investigated, how take-overs create value and change the stock price of the acquiring company.

4.5. Data collection method and analysis
In this chapter, the data collection method is presented, how it was analyzed. The chapter ends with a detailed description of ethical considerations.

4.5.1. Quantitative data collection
Scholars have the choice between primary and secondary data. Primary data can be defined as data that “are generated by an original source, such as your own experiments, surveys, interviews and focus group” (Collis & Hussey, 2014, p. 196). Whereas, secondary data is “collected from an existing source such as publications, databases and internal records” (Collis & Hussey, 2014, p.196). Both of them can be qualitative or quantitative. Quantitative data is data in numerical form and qualitative data is data in non-numerical form.

According to Saunders et al. (2009, p.268), secondary data has a few advantages: few resource requirements, unobtrusive, can provide contextual data, can result in unforeseen discoveries and this data is permanent. But it has also a few drawbacks (Saunders et al., 2009, p. 269): collected for another purpose and is not totally compatible with our needs, it can also be costly and its quality can be questionable. The data collection method is important in our research design. Indeed, it was important for us to collect data as reliable as possible, in order to get results as accurate as possible. In order, to choose suitable data, we considered to use both, primary and secondary data. Our choice was made according to their reliability, their cost, their availability and their relevancy.

Our reasoning was based on our topic and our research design. We thought about the databases used by economic journalists and financial analysts. Indeed, Umeå University provides its students one access to the database Eikon. This database gets its data from companies’ reports. Nevertheless, being conscious of the disadvantages of secondary data, we chose to check some of them manually by reading the annual report in order to be sure of the data quality.

4.5.2. Quantitative sampling technique
According to Saunders et al. (2009, p. 213), there are two sampling methods: the probability sampling method and the non-probability sampling method. The main difference between both sampling methods is that the probability sampling method is
representative for the population. Non-probability samples allow researchers to use their professional judgment in their sample selection. However, they are guided by their research question and their research strategy (Saunders et al., 2009, p. 233). The chosen sampling technique is mostly dependent on the access to data and to what is practically possible (Saunders et al., 2009, p. 243).

We used a convenience sampling. This sampling method is based on the selection of the easiest sample to obtain. The main drawback of this technique was that a bias, that the result would eventually not objective, was introduced and as a result, generalizing the finding could be difficult (Saunders et al., 2009, p.241).

We collected the data with a search engine on the data-base Eikon (Reuters). This data collection method was chosen, because of its completeness. To be sure about the reliability of the data, we checked manually some of it. Even, if this data collection method allowed us to have highly reliable data, some of it was missing. In this case, we excluded the companies with missing data from our sample.

To constitute our sample the following criteria were used. We chose acquirers that have their head office in Denmark, Finland, Norway or Sweden, because we are students in Umeå School of Business Economics and Statistics. Another reason for this choice was that companies in these countries are considered to have a high level of transparency. We limited the acquisitions that took place in G20 countries. That is, because it is a well-known group of countries and every continent is represented: it was important for us to have the possibility of having acquired companies from every continent. Then, it is a way for us to avoid choosing countries arbitrarily or biased from our personal knowledge, it is a way for us to lower the risk of having a biased study. We selected every deal where the acquirer purchased more than 50% of the target company’s capital. The reason for choosing it was, because this threshold allows the acquirer to have the control over the target and must present a consolidated balance sheet. In fact, according to IFRS 10 (2017, para.1), an entity must present a consolidated balance sheet, if it controls another entity. A parent entity controls an investee if: it has the power over it, it is exposed to variable returns related to its involvement in the investee, and it has the power to impact other investors’ return (IFRS 10, 2017 para.7). We chose this threshold in order to be sure that the investor has the control over the investee and that a consolidated balance sheet had to be presented. We focused on acquisitions made between the years 2011 and 2014. This time frame was chosen, because the 2007 financial crisis ended in 2011. The year 2014 was our limit, because then we could be sure to have the financial statements over the two next years. This last fact is important, since it allowed us the get the goodwill impairment over the two following years. We chose this criterion, because Feuilloley and Sentis (2007, p. 95) show that goodwill impairment impacts abnormal returns 750 days after its announcement. Additionally, we chose to study only the deals bigger than 5 million USD to limit sample size to acquisition, which have an impact on the company and to have a reliable sample size. Our sample first contained 303 companies. However, we had to adjust it, because of small inconstancies. Indeed, some companies proceeded to several acquisitions during the same year. That was a problem, since we wanted to observe, if there is a link or a correlation between the market reaction and the goodwill impairment.

To avoid this situation, we proceeded in the following way: if there were 2 years between different acquisitions we took both of them into account, otherwise we took
only the last one into account. If one company proceeded to different acquisition in the same year we took both into account, as these acquisitions are part of the strategy of the acquirer and the market is reacting to the acquirer's strategy.

### 4.5.3. Quantitative data analysis

In order to analyze our data, we needed to put them in an excel file. This helped us to filter companies that proceeded to several acquisitions during our observation time frame. Moreover, the excel file allowed us to transfer all the data easily to SPSS and to use this statistical analysis software. SPSS is widely used in the business research, because of its capacity to analyze a large amount of data (Collis & Hussey, 2014, p. 226).

First we selected our sample with the help of a search engine available on Eikon, then we looked for stock prices of the 5 days before and after the announcement of the acquisition, the goodwill within the 2 years after an acquisition, the industry, the debt-to-capital ratio offered by Eikon, as well the announcement as the effective date of the merger. Then, we calculated the variation of the stock price and the financial structure. We coded these variations, goodwill impairment in the first and in the second year and industry of the acquirer, whether it is a financial or a non-financial company as it can be seen in table 1.

As the purpose of this study is to observe if the market reaction to an acquisition announcement could predict goodwill impairment, we focused on the market reaction, goodwill impairment and elements that could impact goodwill impairment like the industry sector, whether it is a financial or a non-financial companies, the variation of the company’s financial structure and the deal value. Our dependent variables were those related to goodwill impairment (IGC1, IGC2, GSY1 and GSY2) and our independent variables those that were expected to predict goodwill impairment (IND, DFS, Deal value, DSP and DSPC).

We coded the variables linked to market reaction (DSPC) and to goodwill impairment (IGY1C and IGY2C) in order to proceed to correlation and to a logistic regression. Those variable were linked to the occurrence of an event. We used scaled goodwill impairment (GSY1 and GSY2) to examine to what extent an independent variable is able to predict the proportion of goodwill impairment.

We included a variable related to the industry, because the industry sector is important for investors (Geiger & Schiereck, 2014, p.27). Moreover, financial and non-financial companies do not apprehend an acquisition in the same way (Svetina, 2012, p.537). We chose to include the variation of the financial structure in our variables, because financial statements lost their relevancy according to (Lev & Zarawin, 1999, p.383). An acquisition must be financed and increase the balance sheet, it changes the financial structure of the company. This is, why we included the deal value (deal value) in our variables.
4.5.4. Descriptive statistics

“Descriptive statistics are a group of statistical methods used to summarize, describe or display quantitative data.” (Collis & Hussey, 2014, p.226). We used this type of analysis in order to have a better understanding of our data. Moreover, it allowed us to describe and present them. The aim of this type of statistics is to focus on the central tendency and the dispersion (Saunders et al., 2009, p.444).

In order to measure the central tendency, scholars can use the median that represents the middle value and the mean that represents the average of the values (Saunders et al., 2009, p.444). Standard deviation is also important in descriptive statistics, since it shows data dispersion (Saunders et al., 2009, p.447).

4.5.5. Inferential statistics

Before testing a cause and effect relationship between variables we had to test their correlation. In order to analyze the correlation between our independent variables, financial structure and market reaction, with our dependent variables, goodwill impairment after one year and goodwill impairment after two years, we used a bivariate analysis. This type of analysis is used to determine the relationship between two variables. Nevertheless, this method has one main limit: it gives not the causality of the relationship (Bryman & Bell, 2011, p. 244).

Since, the collected data was not normally distributed, we considered them as non-parametric (Saunders et al., 2009, p.449). We were also using a Spearman’s correlation. With this statistical method we got the strength of the relationship between the variables. This strength is usually represented with the coefficient “r” and takes values between +1 and -1 (Saunders et al., 2009, p.459). The closer the coefficient to the extreme values is, the stronger the correlation will be.

Resulting from the fact that we had non-parametric data, our dependent variable, goodwill impairment in year 1 and goodwill impairment in year 2, was dichotomous and our independent variables, market reaction and financial structure, were

<table>
<thead>
<tr>
<th>Variable</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock price increase</td>
<td>1</td>
</tr>
<tr>
<td>Stock price decrease</td>
<td>0</td>
</tr>
<tr>
<td>No goodwill impairment</td>
<td>1</td>
</tr>
<tr>
<td>Goodwill impairment</td>
<td>0</td>
</tr>
<tr>
<td>Non-financials</td>
<td>1</td>
</tr>
<tr>
<td>Financials</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1: Coding explanation
continuous, we decided to pursue a logistic regression (Collis & Hussey, 2014 p. 283). The purpose of a logistic regression is to find out, whether a categorical variable can be predicted from a number of independent variables, also called covariates (Leech et al., 2005, p. 109; Hosmer et al., 2013, p. 1). In difference to the linear regression model, the logistic regression model has a binary outcome. Furthermore, the logistic regression analyzes, how high the chances are that the result will be 1 (Menard, 2002, p. v). Besides, we performed linear and multiple regressions. It allowed us to asses to what extent we can predict the dependent variable according to the independent one. This cause-and-effect relationship is determined by the coefficient of determination. The coefficient, represented by $r^2$, took values between 0 and 1 (Saunders et al., 2009, p.461).

4.6. Ethical considerations

It was important to be aware of ethical issues in the research process, since they can arise at every research stage (Bryman & Bell, 2011a, p. 535). Indeed, research ethics is related to the way scholars are conducting their research, getting data, analyzing them, presenting and reporting their findings (Collis and Hussey, 2014, p. 30). Scholars must be sure that their research design is methodologically and morally valid in the opinion of concerned persons (Saunders et al., 2009, p.184). Qualitative and quantitative research processes are both concerned by research ethics (Bryman & Bell, 2011a, p. 540). Both of research designs need participants to get data.

To define what is morally acceptable within business and management research, scholars have the possibility to refer to the deontological point of view and to the teleological point of view. The first one argues that no end can justify an unethical research design and the second one states that an unethical research design can be justified by the results (Saunders et al., 2009, p.184). Nevertheless, the last stance is problematic, because scholars need to consider costs and benefits of a study.

Researchers must follow some ethical principles in their research process: They have to respect the privacy of all participants, participants must be volunteer, participants must be consent and aware of possible deceptions, researchers must protect anonymity of the participants and the confidentiality of their data, do not harm the participants, and be objective in their research process (Saunders et al., 2009, p.185). The last point means that scholars must present a faithful representation of their results.

One ethical issue with using secondary data could be to manipulate the collected data. In order to be sure that all the data was correct, we checked all of it manually. Furthermore, we stated how we got our data, what criteria we used to get it, with the intention that if someone doubts the correctness of the data, that person can control it.
5. Findings

The following chapter is highlighting the findings that are based on the data collection method. It begins with a description of all data and results. Afterwards, they will be discussed according to hypotheses and the theories presented in the theoretical framework.

5.1. Descriptive statistics

To get an overview of the results of the data collection, descriptive statistics were calculated. Descriptive statistics are used to summarize the data and to get a better overview of it (Collis & Hussey, 2014, p. 226).

Table 2 shows N, minimum, maximum, mean, standard deviation and the median for every used variable. N is the amount of values used. Minimum and maximum are the lower and upper limit of the values. The mean is calculated to get the average of all values in a data set (Collis & Hussey, 2014, p. 244). The standard deviation shows the variation between the mean and the data value (Collis & Hussey, 2014, p. 249). At the end, the median is calculated and shows the middle value of all values, if they are ranked (Collis & Hussey, 2014, p. 244). The advantage compared to the mean is that it is not as much screwed by extremes. The goodwill scaling was calculated by dividing the impairment of the year by the goodwill recognition in order to see in percent, how much goodwill was impaired in that year.

As a reminder, this study includes 43 Nordic companies that acquired another company in a G20 country between 2011 and 2014.

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deal Value</td>
<td>43</td>
<td>5.45</td>
<td>2 158.78</td>
<td>189.29</td>
<td>400.10</td>
<td>54.30</td>
</tr>
<tr>
<td>Financial structure before acquisition</td>
<td>43</td>
<td>3.68</td>
<td>90.68</td>
<td>41.90</td>
<td>23.58</td>
<td>40.72</td>
</tr>
<tr>
<td>Financial structure after the acquisition</td>
<td>43</td>
<td>3.09</td>
<td>90.24</td>
<td>41.87</td>
<td>21.48</td>
<td>43.48</td>
</tr>
<tr>
<td>Variation of the financial structure in %</td>
<td>43</td>
<td>-63.68</td>
<td>584.84</td>
<td>14.30</td>
<td>93.62</td>
<td>-0.08</td>
</tr>
<tr>
<td>Mean of the stock price 5 days before the acquisition</td>
<td>43</td>
<td>0.74</td>
<td>541.90</td>
<td>64.09</td>
<td>90.37</td>
<td>38.46</td>
</tr>
<tr>
<td>Mean of the stock price 5 days after the acquisition</td>
<td>43</td>
<td>0.75</td>
<td>631.70</td>
<td>67.15</td>
<td>102.54</td>
<td>42.95</td>
</tr>
<tr>
<td>Variation of the stock price in %</td>
<td>43</td>
<td>-10.10</td>
<td>22.50</td>
<td>-0.05</td>
<td>17.42</td>
<td>-0.65</td>
</tr>
<tr>
<td>Goodwill recognition</td>
<td>43</td>
<td>489.52</td>
<td>14 716 900.00</td>
<td>720.342.32</td>
<td>3 137 403.62</td>
<td>283 000.00</td>
</tr>
<tr>
<td>Goodwill impairment year 1</td>
<td>43</td>
<td>0</td>
<td>539 000.00</td>
<td>23 747.39</td>
<td>103 815.67</td>
<td>0</td>
</tr>
<tr>
<td>Goodwill impairment year 2</td>
<td>43</td>
<td>0</td>
<td>138 597.36</td>
<td>5 835.83</td>
<td>22 204.98</td>
<td>0</td>
</tr>
<tr>
<td>Valid N (list wise)</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goodwill scaling Y1</td>
<td>43</td>
<td>0</td>
<td>0.05</td>
<td>0.01</td>
<td>0.02</td>
<td>0</td>
</tr>
<tr>
<td>Goodwill scaling Y2</td>
<td>43</td>
<td>0</td>
<td>0.12</td>
<td>0.01</td>
<td>0.03</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: Descriptive statistics all companies
Table 2 shows the descriptive statistics of all analyzed companies. In contrast to this table, 3 and 4 are separated between first non-financial companies and the other table with only financial companies. As it can be seen in Table 2, the deal value variable has a relatively low mean, but a high standard deviation. This is, because this study focused on all deals from 5 million upwards. Resulting from this, most deals are at the lower end, but they are all divided over the whole range. This is even better shown by the median of 54.3. That means that the majority of deals is relatively low compared to the maximum of 2,158.78. The same applies for both, financial and non-financial companies. Only with the difference that on average the deal value for financial companies is much higher than for non-financial companies as it can be seen at their median. The financial structure is calculated:

\[(LT+ST+Current LT) / (LT+ST+Current LT+ Total Capital) \times 100\]

For both together it can be seen that the financial structure slightly decreases over the deal. Even that the financial structure before and after the acquisition looks like there are only small changes, the variation indicates that on average all companies had 14.3% more debts after the acquisitions. If the extremes are excluded it looks different. Then the average of the companies had 0.08% less debts after the acquisitions. In contrast to this, the financial companies had with all extremes 4.18% less debts and without the
extremes also 0.08% less debts. As it can be seen in table 4, the high mean for this is coming from the non-financial companies, since they have a mean of 17.89% increase of debts.

By looking at the differences between the means of the stock prices, it becomes visible that on average the stock price of all companies increased through the acquisitions. However, the standard deviation shows that the view of the mean is biased, as the standard deviation has a much bigger increase, which indicates that there are after the acquisition more extremes than before. This phenomenon is also visible by looking at the variation of the stock price, which shows how the stock price de- or increased over the 10 days. This value shows clearly that the mean of the stocks decreased by 0.05%.

By looking at table 3 and 4 it becomes clear that this increase of stock value comes from the non-financial companies, since the financial companies lost stock value over the acquisition. All three tables show clearly that the impairment one year after the acquisition is much greater than the impairment two years later. This applies as well to financial as to non-financial companies.

5.2. Correlation Analysis
The second descriptive statistic that is appraised is a spearman’s correlation (Table 5). It is chosen to perform this type of correlation, because the data for this study is non-parametric data (Collis & Hussey, 2014, p. 262). The data is defined as non-parametric, because they are not normally distributed (Collis & Hussey, 2014, p. 262). All values of this type of correlation are between -1 and 1, -1 representing a perfect negative correlation, 1 a perfect positive correlation and 0 representing no correlation.

<table>
<thead>
<tr>
<th>Spearman correlation matrix</th>
<th>IGY1C</th>
<th>IGY2C</th>
<th>IDC</th>
<th>Deal value</th>
<th>DFS</th>
<th>DSPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGY1C</td>
<td></td>
<td>0.26*</td>
<td>-0.09</td>
<td>-0.02</td>
<td>-0.27*</td>
<td>0.29*</td>
</tr>
<tr>
<td>IGY2C</td>
<td>0.26*</td>
<td></td>
<td>-0.23</td>
<td>0.06</td>
<td>-0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>IDC</td>
<td>-0.09</td>
<td>-0.23</td>
<td></td>
<td>-0.26*</td>
<td>0.03</td>
<td>0.285*</td>
</tr>
<tr>
<td>Deal value</td>
<td>-0.02</td>
<td>0.06</td>
<td>-0.26*</td>
<td></td>
<td>0.37**</td>
<td>-0.01</td>
</tr>
<tr>
<td>DFS</td>
<td>-0.28*</td>
<td>-0.14</td>
<td>0.03</td>
<td>0.37**</td>
<td></td>
<td>-0.09</td>
</tr>
<tr>
<td>DSPC</td>
<td>0.29*</td>
<td>0.02</td>
<td>0.29*</td>
<td>-0.01</td>
<td>-0.09</td>
<td></td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Table 5: Spearman’s correlation

This spearman’s correlation analysis is performed in order to see, whether the market reaction has an impact on goodwill impairment over the two years following an acquisition. Then, it allows observing, if the dependent variables (IG1C and IG2C) are correlated to the other independent variables: the industry, financial or non-financial, the variation of the financial structure before and after the acquisition, and the deal value.
In this first section, the results of the Spearman’s regression are presented (Table 5). A few correlations were observed. First, goodwill impairment in the first year following an acquisition is positively correlated with the market reaction and goodwill impairment in the second year after an acquisition. Moreover, impairment in the first year after an acquisition is negatively correlated with the variation of the financial structure.

5.3. Regression Analysis

After assessing the different relationships between the different variable with the Spearman’s correlation, the capacity of the independent variables to prognosticate the dependent variables were tested through logistic and linear regressions. First a logistic regression was pursued in order to observe, if the occurrence of the dependent variables can be influenced by independent variables. Then, a linear regression was performed in order to examine to what extent goodwill impairment could be predicted by independent variables.

5.3.1. Logistic regressions

For this study three logistic regressions are performed. A logistic regression is carried out, if a categorical variable should be predicted from a number of predictor variables (Leech et al., 2005, p. 109).

Table 6: Logistic regression Deal Value, DFS and DSP to IGY1C

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deal value</td>
<td>0.00</td>
<td>0.00</td>
<td>0.36</td>
<td>1</td>
<td>0.56</td>
<td>1.00</td>
</tr>
<tr>
<td>DFS</td>
<td>-0.00</td>
<td>0.00</td>
<td>0.06</td>
<td>1</td>
<td>0.80</td>
<td>1.00</td>
</tr>
<tr>
<td>DSP</td>
<td>0.06</td>
<td>0.03</td>
<td>5.5</td>
<td>1</td>
<td>0.02</td>
<td>1.07</td>
</tr>
<tr>
<td>Constant</td>
<td>1.56</td>
<td>0.50</td>
<td>9.6</td>
<td>1</td>
<td>0.00</td>
<td>4.74</td>
</tr>
</tbody>
</table>

The first logistic regression was executed in order to explain how the goodwill impairment after one year, which is the dependent variable, is related to the deal value, the variation of the financial structure and the variation of the stock price, which are the independent variables. That means this test was performed to see, if one of the three independent variables can predict, whether there is goodwill impairment or not. Other variables could be included, too, but that would increase the chance for multicollinearity. Multicollinearity means that two or more predictors have a high correlation, and this would make the logistic regression unreliable (Leech et al., 2005, p. 90).

In contrast to a linear regression or a multiple regression, the dependent variable in the logistic regression has to be binary (Leech et al., 2005, p. 109). Since the dependent variable has to be binary, also called dichotomy, the impairment is coded into 0 and 1. 0 means that there is goodwill impairment in year one and 1 stands for no goodwill impairment in year one.

Table 6 shows that there is a significant correlation between the goodwill impairment in year one and the variation of stock prices. Furthermore, it states that an increase of 1 for the stock price decreases the chance of impairment of the goodwill one year after the acquisition.
acquisition by 1.065. Since there is no significant relationship between the goodwill impairment and neither the deal value of the variation of financial structure, this logistic regression is not unreliable due to multicollinearity. To put it in a nutshell, only the market reaction influences the likelihood of goodwill impairment one year after an acquisition.

Table 7: Logistic regression Deal value, DFS and DSP to IGY2C

The second logistic regression was performed with the intention to see the relationship between the goodwill impairment in year two and the deal value, the variation of the capital structure and the variation of the stock price. In this logistic regression the goodwill impairment in year two is the dependent variable and again the deal value, the variation of the capital structure and the variation of the stock price are the independent variations. As before, the dependent variable has to be binary and therefore, 0 means that there is impairment in year two and 1 means that there is no impairment in year two.

In contrast to the first logistic regression, there is no relationship between the dependent and the independent variations in the second logistic regression as it can be seen in table 7. In other words, none of the independent variables are able to influence the probability of goodwill impairment two years after an acquisition.

Table 8: Logistic regression DSP and IGY1C to IGY2C

The third and last logistic regression for this study was performed to analyze the relationship between the impairment of goodwill in the second year after the acquisition, which is the dependent variable, and both, the variation of stock price and the impairment of goodwill in the first year after the acquisition, which are the independent variables. The intention of this last regression is to analyze, whether a change of either the variation of stock price or the goodwill impairment in the first year can predict the goodwill impairment in the second year. The dependent variable is coded in 0 and 1. Also here 0 means that goodwill impairment takes places and 1 shows that there is no goodwill impairment.

The logistic regression shows that none of either the variation of stock price or the goodwill impairment in the first year can predict the goodwill impairment in the second
year with statistically significant accuracy (Table 8). The probability of goodwill being written off two years after an acquisition cannot be by the market reaction or the goodwill impairment the year before.

5.3.2. Linear regressions
To complete the analysis two simple linear regressions and two multiple linear regressions were performed. This statistical tool is used in order to assess the strength of relationship and between variables and to forecast values (Saunders et al., 2009, p. 467). The difference between a simple and a multiple linear regression is that, in the simple linear regression only one independent variable is used with the intention to foresee a dependent variable. In contrast to that, in a multiple linear regression different independent variable are used (Collis & Hussey, 2014, p. 282). A regression ascertains the coefficient of determination (Saunders et al., 2009, p. 461). This coefficient designated by R-square can only take the values between 0 and +1 and expresses how much a dependent variable is impacted by an independent variable (Saunders et al., 2009, p. 461). The first two linear regressions were carried out in order to assess the relationship between the market reaction and the goodwill impairment the first and second year after an acquisition. The confidence interval is 90%. This confidence interval means that to be significant the p-value must be lower than 0.1.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.193a</td>
<td>0.04</td>
<td>0.01</td>
<td>0.02</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), DSP  
b. Dependent Variable: GSY1

Table 9: Linear regression model summary DSP to GSY1

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized Coefficients</td>
<td>Standardized Coefficients</td>
</tr>
<tr>
<td>(Constant)</td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>DSP</td>
<td>0.64</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Table 10: Linear regression coefficients DSP to GSY1

First, a simple regression analysis (Table 9 and 10) was completed in order to assess the strength of the relationship between the market reaction (DSP) and the scaled goodwill impairment one year after an acquisition (GSY1). The result could display, if there is the variation of the stock price influences the proportion off goodwill written off.

The adjusted R-square is 0.01 (Table 9), which means that the market reaction, the independent variable, affects the dependent variable, goodwill impairment one year after the acquisition, by 1%. It shows a small impact of the independent variable on the dependent one. However, in the table 10 it is observable that there is no significant prediction relationship between these variables (sig=0.215, p<0.1). The proportion of the goodwill written off in the first year cannot be predicted by the market reaction.
Then, the second simple regression analysis (table 11 and table 12) was completed to assess the strength of the relationship between the market reaction (DSP) and the proportion of goodwill written off in the second year following an acquisition (GSY2). The adjusted R-square is 0.24, which means that the market reaction, the independent variable, affects the dependent variable, goodwill impairment one year after the acquisition, by 24%. The market reaction has a significant impact on the level of goodwill depreciation the second year after the acquisition (sig=0.001, p<0.1). The proportion of the goodwill written off can be predicted by 24% with the market reaction.

The third and fourth regression analyses are multiple regression analyses. With the third regression (table 13 and 14) it was aimed to assess the effect of the deal value and the financial structure variation on the level of goodwill impairment the first year after an acquisition.

The R-square is 0.013; since it is close to 0, this R-square is relatively low. The closer a coefficient is to 0, the less significant it is. As stated before, a low R-squared expresses
that the independent variable explains statistically a relatively low percentage of the deviation in the depended variable (Saunders et al., 2009, p. 523). The independent variables do not impact significantly the dependent variable (sig>0.1 and p<0.1). The proportion of goodwill written off the second year following an acquisition cannot be predicted according to the deal value and the variation of the financial structure.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.11a</td>
<td>0.01</td>
<td>-0.04</td>
<td>2.37%</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), DFS, Deal value  
b. Dependent Variable: GSY2

Table 15: Multiple regression model summary DFS and Deal value to GSY2

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Constant)</td>
<td>0.83</td>
<td>0.44</td>
<td>1.9</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Deal value</td>
<td>-0.00</td>
<td>0.00</td>
<td>-0.11</td>
<td>-0.68</td>
<td>6.5</td>
</tr>
<tr>
<td>DFS</td>
<td>-0.00</td>
<td>0.00</td>
<td>-0.03</td>
<td>-1.9</td>
<td>0.05</td>
</tr>
</tbody>
</table>

a. Dependent Variable: GSY2

Table 16: Multiple regression coefficients DFS and Deal value to GSY2

The aim of the fourth regression (table 15 and table 16) was to examine, if the deal value and the variation of the financial structure could predict the proportion of goodwill impaired the second year after an acquisition. The confidence level is 90%, meaning that to be significant, the p-value must be lower than 10%.

The R-square is 0.01. As it is close to 0, it a no predicting value. Like before, a low R-squared expresses that the independent variable explains statistically a relatively low percentage of the deviation in the depended variable (Saunders et al., 2009, p. 523). The independent variables cannot predict significantly the dependent variable (sig>0.1 and p<0.1). The proportion of goodwill written off the second year following an acquisition cannot be predicted by the deal value and the variation of the financial structure.

5.4. Summary of the findings

To put the findings in a nutshell, goodwill impairment in the first year following an acquisition is correlated with the market reaction and the variation of the financial structure. The likelihood to write off the goodwill one year after an acquisition increases with a negative market reaction. Furthermore, this can also predict the proportion of the goodwill written off one year after an acquisition. Then, goodwill impairment in the second year following an acquisition is correlated to goodwill impairment the previous year. However, the proportion of goodwill written off after 2 years can also be predicted by the market reaction at the announcement of the deal. In contrast to the previous stated findings, the deal value and the industry cannot predict either the impairment in the first or second year after the acquisition.
6. Discussion

To find out, whether the market reaction to acquisitions has any impact on the goodwill impairment of the acquiring company one year after the acquisition, several analyses were performed. The result from the linear regression implies that there is no significant prediction of the scaled goodwill impairment after one year by the market reaction.

In contrast to this the logistic regression shows that there is a relationship between the market reaction and the goodwill impairment after one year. Resulting from that analysis, it can be said that an increase of the market reaction by 1 decreases the chance of goodwill impairment one year after the acquisition by 6.5%. This result is also supported by the performed spearman’s correlation test. The results of this test show a clear relationship between the market reaction to acquisitions and the impairment of goodwill one year after the acquisition. Based on this outcome it can be said that if the market reaction after an acquisition turns out good for the acquiring company, the firm is less likely to impair goodwill. That means in contrast, if the market reaction seems to be bad for the acquiring company, the goodwill impairment increases. This is in consonance with the literature findings that companies use the impairment of goodwill in order to satisfy the investors. It means that based on the logistic regression it can be assumed that after an acquisition that resulted in a bad market reaction, companies tend to perform earnings management.

An explanation for this could be that managers intend to use the increased impairment of goodwill one year after the acquisition for an earnings bath. Pajunen & Saastamoinen (2013, p. 248) state that this is one possibility for earnings management. On the other hand could another explanation be that the market was right from the beginning about whether there are synergies between the two companies.

Based on the logistic regression and the literature review, it can be said that the better the market reaction is after an acquisition, the less the management of the acquiring company is likely to impair any goodwill one year after the take-over. This is in harmony with the statement of Pajunen & Saastamoinen (2013, p. 248) that companies in good times companies reduce the impairment of goodwill with the purpose to have it in times of low profitability to use as an earnings bath. Here it is also notable that in the short run the goodwill impairment will decrease the stock price, but the impairment will
have a positive effect on the stock price in the long run (Cheng et al., 2017, p. 328). So, it seems that managers are willing to have a short duration in which the stock price is decreasing to satisfy the investors in the long-term. Even that the results cannot show with what intention the companies impaired the goodwill one year after the acquisition, they most probably impaired it in order to satisfy the investors of the company. This is also in line with the agency theory, since normally the managers are employed with the intention to always act in the best interest of the owners (Kivistö, 2005, p. 1), but as the negative market reaction shows is the acquisition not in the interest of the owners. Therefore, the managers try to satisfy the owners in the long-term by impairing the goodwill and with it increasing likelihood of higher profits for the company in the future. This analysis shows that the hypothesis H1 can be confirmed, as the predictability of the impairment one year after the acquisition by the market reaction is clearly visible.

Based on the second logistic regression analysis it can be said that there is no correlation between the market reaction to acquisition and the impairment two years after the acquisition. In contrast to this, the linear regression shows that there is a correlation between these two variables exists. The goodwill impairment two years after the acquisition is affected by the market reaction by 24%. These results imply that based on the market reaction it cannot be predicted, whether goodwill impairment two years after the acquisition is happening. If an impairment is happening, it can be forecasted how much goodwill will be impaired.

As the findings indicate, the impairment one year after the acquisition has impact on the impairment two years after the acquisition. That also implies that there is some kind of correlation between the market reaction and the impairment in the first year after the acquisition. This is in line with the efficient market theory, which states that all, past, present and future, information are already incorporated in the stock price (Eom et al., 2008, p. 4630). Resulting from that it becomes clear that the market reaction to the acquisition cannot have such a big impact on the impairment two years later, since all information is already implemented in the stock price. Moreover, a response of the management in form of an impairment would eventually be misinterpreted as a form of answer to any other event. Also, it makes sense that the market reaction has impact on the impairment after two years, since also the previous goodwill impairment affects the impairment two years after the take-over. Additionally, to this, the literature describes that goodwill impairment has a positive effect on the stock price in the long-term (Cheng et al., 2017, p. 328). Resulting from that it can be assumed that, if the market reaction to the acquisition was bad, the company will try to satisfy the investors by impairing goodwill one year later. If this resulted in an expected development, the firm has not to proceed to any further steps as a response to the acquisition. If the result is not as expected, the company has to undergo further steps and then, if that is the case, these steps can be predicted. But only if it happens, the result can be predicted, but not whether the impairment is happening. This analysis shows that the hypotheses H2 can be partly accepted, since the market reaction cannot predict, whether the goodwill impairment in the second year after the acquisition is happening. It can only predict to what extend it is happening in case it is happening.

The spearman’s correlation test shows that a relationship between the goodwill impairment in the first year with the one in the second years exists. That would mean
that the impairment in the first year has impact on the goodwill impairment in the second year.

The linear regression analysis shows the same result that a relationship between these two variables can be concluded with a confidence level of 90%. The logistic regression test on the other hand shows that it is not possible to predict any change for the impairment in the second year based on the goodwill impairment in the first year.

The fact that there is a relationship between these variables, even that they cannot predict each other, is in line with previous studies. To this point, Cheng et al. (2017, p. 328) state that the impairment of goodwill has a negative effect on the stock price in the short-term, but affects it positively in the long run. Based on this and the findings of this thesis it can be assumed that the impairment of the goodwill in the first year has such an impact on the stock price in the long-term, that it also has effects on the impairment of the goodwill in the second year after the acquisition.

Resulting from that, it can be assumes that the management of the acquiring company only takes the last year into consideration but is not looking further back while performing the impairment tests. As stated before, this could be based on the efficient market theory, since everything further back is already incorporated into the stock price (Fama, 1970, p. 383) and if the management would look further back and would impair goodwill as an response to that, the investors would consider it as a response to something completely else.

Based on this analysis it can be said that hypothesis H3 can also be accepted. It is observable that non-financial and financial companies do not benefit from the same market reaction. Stock prices increase for financial companies after the announcement of an acquisition. However, according to the spearman’s correlation it was found that the industry sector has no impact on goodwill impairment in the first and the second year after an acquisition (H4). This result was not expected since there are significant correlations between the market reaction and the goodwill impairment in the first year after an acquisition and the industry sector and market reaction. Moreover, non-financial companies are expected to pay more for an acquisition than financial companies (Svetina, 2012, p. 537). In contrast to this, non-financial companies proceed to acquisitions in order to gain a competitive advantage. The main reason for a company to proceed to an acquisition is to get synergies (Mukherjee et al., 2004, p. 8-9). In this case, they will pay the present value of the potential synergies (Svetina, 2012, p.537). Besides, the concentration of an industry has an effect of the merger trend within this industry. Furthermore, it was observed that an entire industry is changed by a merger and acquisition wave, meaning that an individually deal happens seldom (Hou et al, 2015, p. 140-141). Merger waves are often clustered by the industry (Moran, 2017, p. 174). It is also important to note that capital market’s reaction about a merger or an acquisition is not only focusing on the acquirer’s and target’s financials and perspective. In fact, it is also about the competitor’s health (Geiger & Schiereck, 2014, p.27).

Indeed, value creation depends on the industry conditions (Huyghebaert, & Luypaert, 2012, p. 1832): the more it is concentrated, the more production gains are an important motivation for an M&A deal (Geiger & Schiereck, 2014, p. 27). Some industrial sectors like companies in the industrial high-tech sectors have non-relevant financial disclosures (Francis & Schipper, 1999, p. 342). These industries do not provide value relevant information, because they are intensive intangible industries and because of the
inability of the accounting standard to produce faithful representation of the reality (Lev & Zarowin, 1999, p. 383). Even, if the current literature states that M&A deals and industries sectors are closely linked, goodwill impairment is not impacted by belonging to either the financial or non-financial industry. According to the statistic results hypothesis H4 can be rejected. However, these results might be mitigated by the small size of the sample. Moreover, the sample is geographically concentrated on four Nordic countries.

According to the Spearman’s correlation, it was found that the variation of the financial structure and the goodwill impairment one year after an acquisition (H5) are correlated. However, there is no correlation between the change of the financial structure due to an acquisition and goodwill impairment for either one or two years after an acquisition. The logistic regressions show that it is impossible to predict the likelihood of goodwill impairment in the first and second year after an acquisition with the change of the financial structure. The multiple regression pursued in order to see, if the change of the financial structure impacts the percentage of goodwill written off. Results show that it is not possible to predict statistically the goodwill impairment by the variation of the financial structure. Goodwill impairment is known as being an earnings management tool. There are two types of earnings management: accrual-based earnings management that have no economic effect and real earnings managements (Moratis & van Egmond, 2018, p. 2). Financial analysts do always pay attention on the financial statements: they look at the book value of equity and the earnings especially during a crisis (Kane et al., 2015, p. 190). In order to increase their earnings and not to decrease their book value of equity companies are less incline to proceed to goodwill impairment. Indeed, impairments lower the earnings and the net result that is transferred to the equity. Moreover, before writing off the goodwill managers tend to look at the covenants that are often related to the financial structure (Beatty and Weber, 2006, p. 257). Goodwill impairment will automatically modify the financial structure of a company. Then, the investors pay attention about the financial structure of the deal and react accordingly. In fact, the market is more likely to react positively to a cash merger than to an equity merger (Rhodes-Kropf & Viswanathan, 2004, p. 2710). Paying cash for a merger allows the acquirer to increase the probability to reach its forecasts (Emery & Switzer, 1999, p. 84). This result comes in opposition with the theory that there is a decrease in the correlation of companies’ stock price and their book value. Besides that, intangible assets have a relatively low value relevance (Lev & Zarowin, 1999, p. 383). This is due to the inability of the financial statements to reflect the value of the intangible assets. The inability comes from the accounting standards that are not adapted to intangible industries. In addition, audited financial statements are less relevant, because the evolution of the reporting model (Francis & Schipper, 1999, p. 323).

The fifth hypothesis can be rejected, since the independent variable has no predictive value on the independent variable. This is supported by the literature that mitigate the usefulness of current financial statements.

The Spearman’s correlation shows that there is no correlation between the deal value and goodwill impairment in the first and the second year after an acquisition. This non-correlation is supported by the logistic and linear regressions that prove the fact that it is not possible to use the deal value in order to predict goodwill impairment one and two years after an acquisition. Gu and Lev (2011, p.2001) argue that having an overpriced stock encourages acquirers to overvalue targets and to proceed to expensive deals.
deal value is mostly determined by the expected synergies. Nevertheless two elements are important in the pricing of a target; the bargaining power of the acquirer, target’s managers’ willingness to sell the company (Gu and Lev, 2011, p.2001) The more the acquirer has bargaining power and the more managers of the target have incentive to sell it, the lower is the price. Additionally, the acquirer pays often a premium. The premium is the cash or securities that are paid in excess of the target’s value and that is justified by the potential synergies (Nielsen & Melicher 1973, p.139). According to Shleifer and Vishny (2003), the price paid for an acquisition must be lower than the future value of synergies. If the acquirer pays too much for an acquisition meaning that the deal value exceeds the value of the future synergies, the acquirer will have to write off the goodwill. This means that there is a link between goodwill impairment and overpriced acquisition. The result of this degree project might be in line with the theory, if none of the companies in the sample of this degree project overpaid an acquisition. In opposition of the literature, hypothesis (H6) can also be rejected. However, this result could be mitigated by the settings of the sample.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>The market reaction impacts the goodwill impairment after 1 year</td>
<td>accepted</td>
</tr>
<tr>
<td>The market reaction impacts the goodwill impairment after 2 year</td>
<td>partly accepted</td>
</tr>
<tr>
<td>Goodwill impairment after the first year impacts goodwill impairment after the 2nd year</td>
<td>accepted</td>
</tr>
<tr>
<td>The industry sector impacts goodwill impairment</td>
<td>rejected</td>
</tr>
<tr>
<td>The financial structure impacts goodwill impairment</td>
<td>accepted</td>
</tr>
<tr>
<td>The deal value impacts goodwill impairment</td>
<td>rejected</td>
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7. Conclusion

First, this chapter will start with the general conclusion. This is directly related to the research question and the findings of this degree project. Following this the theoretical and practical contribution are stated. Then the chapter continues with suggestions for further research and the limitation of the conducted research. At the end it is stated, what steps have been taken in order to increase the credibility of this study.

7.1. General conclusion

After the introduction of IFRS 3, which changed the write off method of goodwill from amortization to impairment, there were many critics that it would benefit earnings management, since the management could use subjective judgment (Zang, 2008, p. 39). The main purpose of this degree project is to investigate the predictability of the goodwill impairment in the two following years after the acquisition by the market reaction to acquisitions. In order to be able to investigate this a research question was created:

To what extent does the market reaction to acquisition announcements predict the goodwill impairment?

The main finding of this quantitative research is that the goodwill impairment one year after the acquisition can be predicted by the market reaction to the take-over. Based on the findings it can be said that if the stock price is increasing by 1, the chance of a goodwill impairment to happen is decreasing by 6.5%. These findings are in line with the existing theory, since it states that managers use the impairment for earnings management, to either hold the goodwill in bad times or impair it in bad times with the intention to increase the chance for future profitability (Pajunen & Saastamoinen, 2013, p. 248). But it could also be that the market was right from the beginning and the company is adjusting the goodwill accordingly.

Furthermore, the market reaction and the goodwill impairment two years after the acquisition are correlated. It cannot be predicted whether the impairment in year two is happening, but if it does, it can be forecasted how much will be impaired. Additionally, there is a correlation between the goodwill impairment in year one and the goodwill impairment in year two. However, even that there is a statistically significant relationship between both variables they cannot predict each other. There is also a correlation between the variation of the financial structure and goodwill impairment in the first year following an acquisition.

In contrast to these correlations, the deal value and the industry have not a significant impact on the goodwill impairment in the two years after the acquisition. Those results are not in line with previous theories. Indeed, financial and non-financial companies pay not the same price for an acquisition (Svetina, 2012, p. 537). Additionally, M&A waves take place within industries and there is no propagation of this wave. There should be a correlation between the deal value and goodwill impairment. The value of a transaction is often the present value of the future cash flows and synergies, but if there is a misevaluation, goodwill has to be written off in order to reflect the fair value of the company. Then, the financial structure does not impact the proportion of written off
goodwill. Moreover, it was found that there is no correlation between the industrial sector and goodwill impairment.

Concluding can be said that the goodwill impairment in the first year can be predicted by the market reaction. Furthermore, the impairment in the first year and the second year are correlated. Resulting from that can the amount that is impaired in the second year after the acquisition be predicted, but not whether it happens.

7.2. Theoretical contribution
This study has one main theoretical contribution. In fact, it shows that there is a correlation between market reaction and goodwill impairment within the two years after an acquisition. It contributes to the current literature by exploring the correlation between the goodwill impairment and stock prices. Beside this, the main contribution is that some findings are in contrast to the current literature. Indeed, it was not expected that the deal value, the financial structure and the industry are not impacting goodwill impairment. This study also explored the different elements that are able to impact goodwill impairment. Moreover, this study was able to identify these elements with the help of the literature review. The results of this research fill the literature gap that was stated in the. They identified that literature was missing about the relationship between the market reaction after acquisition announcement and goodwill impairment after this acquisition. Based on the findings of this degree project, other studies can be conducted. Fields for those studies can be found in the chapter „suggestions for further research“. Now it is known that the market reaction to acquisitions has impact on the impairment of goodwill in the years following the acquisition. By finding that the gap, which is created by the IFRS 3 implementation, is used, this degree project contributes to the literature.

7.3. Practical contribution
This degree project has also a practical contribution. It can be used by managers and financial analyst in order to communicate better and to make better investment decisions. Goodwill has become an important balance sheet’s item. However, the contribution is not only limited to managers and financial analysts, but it can also help the accounting standard setters. After seeing this research, financial analysts are also more aware of this correlation between the market reaction and the goodwill impairment and with this they are able to understand better how companies write off the goodwill. Furthermore, they can better understand how the goodwill impairment is related to an acquisition the years after it took place. Managers can learn, that they have to improve the communication their decisions in order to have benefits for the company. Last but not least, the accounting standard setters see that there is a big gap. With this knowledge they can conduct a deeper research about the reason for the correlation. Eventually they have to take the initiative to reduce this gap.

7.4. Societal considerations
As financial markets are becoming even more important in our current economy than they already are and our economy shifted from a tangible industry to intangible industry, our study aimed to allow people that are not financial analyst to understand more how financial markets are working. We think that it is important for them to understand them better. In fact, this misunderstanding is at the origin of a distrust
towards the financial markets. This suspicion led to tensions that are sources of risk for people. We are convicted that a better understandings of financial markets and their links to the “real” world could decrease these tensions and be at the origin of a sustainable growth.

However, this can be achieved only if companies are more committed to their stakeholders. In order for that to happen, they need a long-term strategy and a better understanding of their stakeholders and their needs. We think that a way to reach this goal is to better understand how markets are reacting to the communication of companies and to take their reaction into consideration in order to make the best investment decisions.

7.5. Suggestions for further research
Due to the fact, that this research has limitations, there are several areas for further research. Since most studies on the field of goodwill impairment only focus on what impacts the impairment has on the stock price and not vice versa, future studies have a broad field to research.

This research focused only on the predictability of the goodwill impairment in the two years after an acquisition by the market reaction. Here another study could research what impact the industry of both, the acquirer and the target, have on the impairment afterwards. Here the industry should not be limited to financial and non-financial companies like this research had. This study could be similar to this one, but instead of focusing on the market reaction, it would consider the industry and analyze the relationship of it with the goodwill impairment in the years after the acquisition. Since this study has the limitation that the sample size is fairly small, a future research on this field should consider taking a larger sample in order to make a more valid research that can be better generalized to other companies. By doing so, it would be interesting to focus on a wider market like instead of only focusing on Nordic countries as acquirer, a future research could take companies from the whole European Union in the sample.

7.6. Limitations
This research had the impact of time as a limit, since the set duration was only seven weeks. If the timeframe would have been longer, this study could have taken more companies into the sample in order to make the results more reliable. In addition to the time limitations, the researchers faced some technical issues. After extracting the data from the database Eikon, some samples were taken with the intention to control the quality. By doing this it was found out that the data extracted from the database was in many cases not correct. Resulting from this all data for each company in the sample had to be checked. This extra work had the impact that much of the already limited time had to be spend on the checking of the data for correctness.

As stated before, due to the limited amount of time, the sample size had to be adjusted that the data collection was possible in that duration. Therefore, the research was limited to companies from the Nordic countries Denmark, Finland, Norway and Sweden. Furthermore, the target companies that were acquired from these companies in were limited to firms in G20 countries.
Another limitation is that for acquiring companies, it is not mandatory to state the impairment of goodwill for the acquired companies separately. Hence, this research could only take the complete goodwill impairment of the company into account instead of analyzing the goodwill impairment for an acquired company individually. Additionally, it has to be taken into account that the economic situation changed over the timeframe, on which this study focused.

Since this topic was very interesting to study and to find out more about the predictability of the goodwill impairment after acquisitions by the market reaction of acquisitions, it would have been preferred, if the sample size would have been larger. This would have increased the reliability of this study and maybe also shown more correlations between some other variables and the impairment of goodwill. However, taking into account the limited timeframe and other recourses, the increase of sample size was not possible. Therefore the sample size had to be narrowed down to 43 companies.

7.7. Credibility
Quantitative and quantitative researches must be credible. That means that they have to answer quality and truth criteria. According to Byram & Bell (2011, pp. 165-175) a quantitative study can be identified as credible, if it encompasses the following criteria: reliability, validity, generalization and replication.

Resulting from the fact that many factors are influencing a research, several aspects have to be considered in order to increase the credibility of the study. According to Saunders et al. (2009, p. 156), it is important to have a good research design. Additionally, two aspects of the research design help to reduce the possibility of having a wrong outcome: reliability and validity.

The reliability is related to the consistency of the “measure of a concept” (Byram & Bell, 2011, p.158). Stability of the measure, its internal reliability and the inter-observer consistency makes the measurement reliable (Byram & Bell, 2011, p.158). Our results are stable in the time: we focused on a time frame and financial statements cannot change. Both other criteria are not affecting our reliability, because they are linked to personal judgment. In fact, internal reliability requires that index and scales are coherent and inter-observer consistency requires that more than one researcher uses its professional judgment when it comes to subjective activities like observation.

Validity is focused on the integrity of the research’s conclusion (Bryman & Bell, 2011, p. 42) Furthermore, it concentrates, how accurate and consistent the concept and its measure is (Bryman & Bell, 2011, p.159). That means validity is about, whether the findings of a study are really what they are (Saunders et al., 2009, p. 157). This study is based on the IFRS guidance and all the financial data come from audited financial statements. IFRS are accounting standards that are accepted worldwide and audited financial statements are free from material misstatements.

The purpose of a quantitative research is to generalize the findings (Byram & Bell, 2011, p.163). To be generalized the study must be based on a representative sample (Byram & Bell, 2011, p.164). Even if our sample size is small, it might be big enough according to our sampling method to generalize our findings.
8. References


9. Appendix

Appendix 1 List of companies

Swedbank AB
Investment AB Latour
Jyske Bank A/S
Nordea AB
Norwegian Property ASA
Sparebanken Vest
Vestjysk Bank A/S
Opus Prodox AB
Gunnebo AB
Tele2 AB
Rockwool International A/S
Huhtamaki Oyj
VBG Group AB
Outotec Oyj
Telenor ASA
NGS Group AB
Glunz & Jensen A/S
Hafslund ASA
Skanska AB
Statoil ASA
Solteq Oyj
Suominen Oyj
Suominen Oyj
Trelleborg AB
NCC AB
Atria Oyj
Royal Unibrew A/S
Schibsted ASA
FormPipe Software AB
New Wave Group AB
Bilia AB
Novozymes A/S
PKC Group Oyj
Sweco AB
Systemair AB
TTS Group ASA
Cloetta AB
Grieg Seafood ASA
Orkla ASA
HMS Industrial Networks AB
TDC A/S
Elisa Oyj
Hafslund ASA