



**LUND UNIVERSITY**

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# **Credit Rating Changes and Post-M&A Firm Value**

Assessing the importance of credit ratings changes as a motive  
for successful M&A

by

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## ABSTRACT

*This research shows the impact of credit rating change (thereafter CRC) announcements on the combined entities following mergers and acquisitions. In looking at the effect of CRC announcements on share prices, we measure the level of influence that a credit upgrade or downgrade has on the equity value of firms. Existing literature disputes the applicability of share price as a measure of value creation, preferring instead to measure effects on company fundamentals. By complimenting the research with impacts of CRC announcements on operational performance, this study also considers the level of economic value creation in firms post-M&A. We present evidence of statistically insignificant negative abnormal returns with downgrade announcements and insignificant positive abnormal returns to upgrade announcements. In addition, this thesis finds statistically significant negative abnormal long-term operating performance for downgrades, and less significant effects for upgrades. Comparing the findings to previous literature on either M&A or CRC announcements, the research discovers proportional result between abnormal equity returns and abnormal performance, thus the efficient market hypothesis applies. A small sample size is the primary limitation, and therefore future research is recommended.*

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# 1. INTRODUCTION

*“Many corporations that consistently show good returns both on equity and overall incremental capital have, indeed, employed a large portion of their retained earnings on an economically unattractive, even disastrous, basis. Their marvellous core businesses, however, whose earnings grow year after year, camouflage repeated failures in capital allocation...”*

Warren Buffet, Berkshire Hathaway Annual Report, 1984

## 1.1 Background

Mergers and acquisitions have experienced continued growth in the market for corporate control, as well as in research. What was once an idiosyncrasy of the North American market has expanded over the past two decades into international business stardom among pundits and academics (Bertrand & Zuniga, 2006; Bruner, 2002; Zollo & Meier, 2008). A good example has been the European market, which, at the beginning of the new millennium, has been a source of tremendous intensification in both volume and frequency of M&A transactions, presumably from a new economic structure and development of the European Union (Gaughan, 2007). Strong growth in M&A deals throughout Europe has been seen over the past 10 years, barring the 2008 financial crisis (Appendix 1). Sustained M&A growth is to be expected, due to the recent implementation of quantitative easing by the European Central Bank (Financial Times, 2015)- the result of which should inflate share prices and provide easier access to capital for purchases (Di Giovanni, 2005). As the field evolves in terms of experience and technology, an incremental use of new rules, methods and motives, created with the intention of considering the mistakes of prior deals as

well as the economic and financial conditions. Yet, the ongoing debate between the conventional wisdom that most acquisitions destroy value or whether it is actually value creating is far to be over. Reading the available literature, it is frequent to encounter inconsistent results (Asquith, Bruner & Mullins, 1983; Berger & Ofek, 1995; Healy, Palepu & Ruback, 1992; Meeks, 1977; Mueller, 1980; Ravenscraft & Scherer, 1987). It is also recurrent to come across CEOs' announcements in which are explained and estimated potential synergies that in most of the cases appear artistically conceived (Mendenhall, 2005). What they all have in common is the absence of a central element that makes M&A a more exact science, a component that is clear and understandable, that it is easy to present to shareholders and the market, one that it is hard to question and accessible to everyone. As a possible solution, this thesis presents the role of credit rating agencies (thereafter CRAs) and their credit assessment as a potential signal device for M&A' success.

## **1.2 Purpose of this Research**

This thesis evaluates the effect of credit rating change (thereafter CRC) announcements on firm value post-M&A completion, with a geographical delimitation of European acquirers. Abnormal shareholder returns are analyzed, and used as indicators of the market reaction to CRC announcements. Long-term operating performance is measured using accounting ratios before and after the announcement dates. The results of these tests are subsequently used to make conclusions about the level of importance that is *currently* placed, and *should* be placed, on credit rating change announcements.

The hypotheses to be tested are as follows:

*H1: A credit rating upgrade following a merger or an acquisition generates an abnormal positive return on the stock price and vice versa, as a result of information signaling.*

*H2: Firms that received an upgrade on credit rating following a merger or an acquisition experience incremental operating performances in the long-term and the opposite for those downgraded.*

By testing these hypotheses, this thesis aims to provide shareholders and management with clarifying elements about M&As. Firstly, is the goal of providing shareholders with a reliable information signal in order to mitigate effects of information asymmetry, explained later. Secondly, this study aims to support the M&A decision-making process by management, by proposing CRC announcements as a source of unbiased value signaling.

Previous studies focus on the impact of M&A announcements on equity value (Bauer & Matzler, 2014; Fuller, Netter & Stegemoller, 2002; Grinblatt & Titman, 2002) or operating performance (Healy et al, 1992; Lubatkin, 1987). However, the existing literature appears to have ignored the importance placed by shareholders on impartial analysis such as credit rating agencies after M&A deals. Studies on measures of effectiveness of mergers and acquisitions are inconclusive (Bauer & Matzler, 2014; Jensen & Ruback, 1983) and often contradictory (Mulherin & Boone, 2000; Jensen, 1988). Bearing in mind agency costs of managerial incentives and information asymmetry (Ogden, 2003), we challenge the current level of information available to shareholders and management, and call for greater emphasis to be placed on CRC announcements post-M&A.

### **1.3 Thesis Outline**

The structure of this thesis is as follows: Chapter 1 presents the background aims and purpose of the study, and how the research will be approached. Chapter 2 begins with a case study of Royal Dutch Shell's purchase of BG Group, and then discusses existing motivations of M&A deals and previous empirical studies. Chapter 3 outlines the methodology, including the research approach, design, and analysis. Chapter 4 discusses results further, and how it fits into the overall body of literature. Chapter 5 concludes by summarizing this thesis project's limitations and suggestions for future research.

## **2. RELEVANT THEORY AND LITERATURE**

This Chapter begins by presenting the case of Royal Dutch Shell's purchase of BG Group. Subsequent sections on relevant theory and literature will be tied to this case study for better understanding. The chapter is divided into two sources of relevant literature: theoretical and empirical. We begin with a discussion of theoretical literature, focusing on commonly cited motivations for management to engage in M&A deals. Certain theories are also helpful to understand in the context of our research, and will be explained briefly. In the second component, empirical research is analyzed. Together, these will provide sufficient background information in order to understand the focus of this study.

### **2.1 Case Study: Royal Dutch Shell**

On April 8th 2015, Royal Dutch Shell announced its acquisition of rival BG Group for \$70 Billion in cash, which would create Europe's largest oil and gas company (Bloomberg, 2015). According to Bloomberg (2015), the transaction included a 50% premium, which has been justified with reasons of synergies and gains from momentum. It is also important to mention that both companies have a good degree of business relatedness, yet some operational differences: Royal Dutch Shell's core business is focused on oil, while BG specializes in gas (Bloomberg, 2015). Shell's CEO Ben Van Beurden promptly discussed the company's acquisition on Bloomberg (2015) where he highlighted:

- Cost reduction from economy of scale and scope due to new assets deployment.
- Efficiency enhancement through the use of Shell's technology and intangible capabilities.
- Diversification into the gas industry, hence broadening the company's products.



- Elimination of competitor from the market.
- BG's assets undervaluation because of current low oil price.

According to Bloomberg (2015), stakeholders however, were less welcoming of the acquisition. The share price experienced a large drop, while analysts doubted the level of compatibility with BG's Brazilian operations. Soon after, Moody's placed a negative outlook on the company's credit rating (Bloomberg, 2015).

Motivations for engaging in M&A transactions manifest in different forms. Hubris, disturbance theory, synergies, and diversification are among the most evident in this case, and will be explained further in the literature review.

## **2.2 Theoretical Background**

Using the reputed author of corporate finance, Joseph Ogden, as a basis for theoretical discussion, this section provides a necessary background of management theory. This will provide insight into the most commonly cited motivations for embarking on M&A deals. At the core of relationships within a publicly held organization is asymmetrical information between shareholders and management (Ogden, 2003). Management has a better understanding of the firm's true value and prospects for future success, while shareholders must rely on their own ability to monitor the firm. Especially in cases of diffuse ownership, the reality of a shareholder's understanding of the firm is dependent on opinions from management or other indicators (Tricker, 2012). The sensitive nature of a firm's trade secrets leads us to believe that the lack of information provided to shareholders will remain unchanged (Healy et al., 1992). Akerlof's studies (1970) provide examples of how information asymmetry can manifest (Akerlof, 1970). In the same way that his research on the market for used automobiles exemplifies

the potentially hazardous buy/sell decisions being made, we draw the parallel to shareholders and managers in the role of an acquirer in M&A deals. In situations where shareholders lack information, or managers are confined by bounded rationality, a signal is helpful to avoid pooling equilibrium and adverse selection (Spence, 1973). We agree with Spence's recommendation for a signal that cannot easily be mimicked by *lemon* firms, and posit that a CRA could fill this role. This research therefore tests the degree to which shareholders *do* and *should* base investment decisions on the advice of CRAs when assessing an M&A deal. Building upon the research of Spence (1973), a series of studies have likened such signals to information transfer mechanisms, whereby shareholders and management have a more equal level of knowledge, as opposed to the existing asymmetry (Alchian & Demsetz, 1972; Riley, 1979; Rothschild & Stiglitz, 1976).

Before looking at the motivations behind M&As, it is useful to understand the incentives of both management and shareholders. According to Ogden (2003), management has two sources of self-interest: an inherent goal of increasing their compensation, and decreasing the riskiness of their compensation (Ogden, 2003). Firstly, the goal of increasing compensation is seen through management's incentives to maximize the size of the firm, rather than its value (Ogden, 2003). Secondly, is management's self-interest in reducing the risk of their compensation, through excessive diversification, bias towards investments with short-term payoffs, and entrenchment (Ogden, 2003).

Shareholders by contrast, are incentivized by greater returns, which are realized through riskier investments. As the principal participant in their relation with firms, they employ management as their agent, to maximize the market value of the firm's equity (Ogden, 2003). The self-interests of both parties help explain the recurrence of many motivations, as summarized in (Appendix 2) and explained further next.

The case of Royal Dutch Shell exemplifies some common managerial motivations for seeking M&A deals, which we explain further next. The acquiring firm's justification for a 50% purchase premium stems from a variety of motivations. Therefore, for the purpose of this study, we draw on several theories: a) Synergies b) Disturbance Theory c) Diversification and elements of d) Hubris. Although there are numerous other motivations for M&As, these four are highlighted due to their prominence in the case, and the applicability across numerous other M&A transactions.

Synergies refer to the merged entities having a greater value than the sum of its parts (Gaughan, 2007). In this case, Royal Dutch Shell CEO Ben Van Beurden justifies the choice of premium paid for BG, by citing the greater combined effects of the two firms upon completion. Synergies are often divided into operating (e.g. revenue enhancement, cost reduction) and financial (e.g. lower cost of capital) such that  $1 + 1 = 3$  (Gaughan, 2007). Disturbance Theory (Trautwein, 1990) attributes the decision of merging or acquiring, to economic disturbances that demand change by firms. Royal Dutch Shell has justified the timing of their purchase with the shock in oil prices, which had dropped to a low of \$50/barrel at the time the deal was covered by media (Financial Times, 2015), which caused a reorganization of the entire industry and therefore demands actions by firms to remain competitive (Trautwein, 1990). Diversification (Gaughan, 2007) is explicit in Van Beurden's motives, who posits that shifting Shell's focus from oil to natural gas will help future value creation. Finally, hubris (Ogden, 2003) is seen implicitly in Shell's case, as Van Beurden has shared his full confidence in the ability of his firm to fully capitalize on synergies and economic shocks to justify a seemingly overconfident bid premium (Bloomberg, 2015).

Two categories of motivations start to emerge in the example of Royal Dutch Shell, which we also believe are apparent in many M&A transactions. Firstly, the presence of managerial incentives is evident. Whether through excessive

diversification or hubris, motivations stemming from management desires to increase personal compensation while reducing riskiness of their compensation manifest in theory (Ogden, 2003) and in practice (Bloomberg 2015). If readers agree that the responsibility is too onerous for shareholders to decipher management's true intentions with an M&A deal, (s)he will find relevance in this study's assessment of CRC announcements as signals of value creation/destruction. Synergies are the second common trend motives for M&As. As explained in detail later, empirical studies on the synergistic effects of M&As are inconclusive (Bauer & Matzler, 2014; Jensen & Ruback, 1983). Relevance of this study will again be apparent if readers consider that synergistic effects are too difficult for management to accurately predict upon entering into M&A agreement. This notion is supported by the Process Theory, whereby management is confined by bounded rationality and decision-making (Trautwein, 1990).

Researchers posed a valuable question in the study by Brouters, Van Hastenburg, Van den Ven (1998): If Most Mergers Fail, Why are they so Popular? In concluding this theoretical review, the authors support the Process Theory (Trautwein, 1990) and Hubris (Ogden, 2003) motivations for M&As, as they appear to account for much of the contrasting evidence for M&A success factors. This is further supported by the fact that while target firm shareholders receive a premium of between 8% and 20.2% (Jensen, 1988; Mulherin & Boone, 2000; Bagchi & Rao, 1992), those of the acquiring firm have been shown to receive substantially less, with returns between 0-6.5% (Jensen, 1988; Bagchi & Rao, 1992).

### **2.3 Empirical Research**

The empirical literature on the stock returns and operational performance of acquirer firms in M&A deals is discussed in this section, in order draw

comparisons and contrasts with theoretical knowledge, and build the foundational knowledge for this thesis project's research.

With M&A deals having become increasingly common in the market for corporate control, an abundance of literature has focused on the extent to which shareholders of acquiring and target firms benefit (Bauer & Matzler, 2014; Fuller et al., 2002; Grinblatt & Titman, 2002; Healy et al., 1992; Lubatkin, 1987). Studies have provided convincing research on the effects of pre- and post-M&A factors for success. It appears that most studies have concluded greater benefits for target firm shareholders than acquirer (Jensen, 1988; Lubatkin, 1983; Mulherin & Boone, 2000). A number of other factors have shown varying impacts on M&A effectiveness, such as the degree of relatedness between acquirer and target firms (Kim & Finkelstein, 2009; Matsusaka, 1993), relative target firm size (Bagchi & Rao, 1992; Bauer & Matzler, 2014), and degree of complementarity (Bauer & Matzler, 2014; Kim & Finkelstein, 2009; Harrison, 2001). Literature has provided support for both organizational factors such as the ability to integrate and spread tacit knowledge (Bauer & Matzler, 2014; Birkinshaw, Bresmaz & Hatakson, 2000; Haspeslagh & Jemison, 1991) and financial factors such as lower tax payments, broken contracts with managers, and mistakes in valuation by inefficient capital markets (Jensen, 1988) as contributors to post-M&A success.

Testing the effects of these variables on M&A success is usually conducted through regression analysis (Fuller et al., 2002) or event studies in order to measure any change in abnormal returns ( $AR$ ) or cumulative abnormal returns ( $CAR$ ) on the acquiring firm's share price (Grinblatt & Titman, 2002; Healy et al., 1983; Lubatkin, 1987). For example, although the stock return at the time of announcement cannot solely be attributed to the expected effect of the acquisition on profitability (Grinblatt & Titman, 2002), evidences suggest that acquiring shareholders earn, on average, a zero abnormal return at the acquisition's announcement (Fuller et al.; 2002). Other studies analyze operational

performance through measures like return on assets (*ROA*), return on equity (*ROE*) (Mueller, 1980), or operating cash flow (Healy et al., 1992) due to what they believe is a better indicator of economic gains. In this case, previous researched are even more contrasting. The study from the last mentioned authors (Healy et al., 1992) dates back to the 1980's and found evidence of M&A operational value creation in USA. More recent but less reliable source (Gmelich, 2011), reports significant negative abnormal performance on the long run in USA, and slightly positive for European firms. Recent literature from Bauer & Matzler (2014) acknowledge the fragmented research and often opposing evidence on M&As, and propose a holistic approach to better understand the interdependencies of M&A success factors (Bauer & Matzler, 2014). This thesis helps provide closure on M&A success indicators, by looking at the impact of CRC announcements on the share price and operational performance of firms post-M&A. This will be explained further in Chapter 3.

## **2.4 Role of Credit Rating Agencies**

To understand the relation between M&A and ratings it is a priority to appreciate the key features of credit rating. In this section, we first present a descriptive outlook of credit agencies while considering how M&A activities influence their pronouncements. Then we explain ratings' role and their usefulness in the financial market. Then, we clarify the meeting point where credit rating encounters corporate structure decisions. After that, with the support of the Royal Dutch Shell case, we evaluate a new, implicit function of credit agencies that, through the media, appear to be protagonists of corporate transactions' opinions and verdicts directly related to M&A's motives. Lastly, we have an insight of previous studies in regards to the power of rating changes on

companies' stock price; this will be also used in the analysis of our result to assess the congruence with existing literature.

#### 2.4.1 Credit ratings and their impact on finance

One of the main indicators of corporate quality is the rating assigned to the corporation as well as its outstanding by independent credit agencies (Altman, 1998). Credit agencies are private institutions that assess the prospect of a credit default, defined as the miss or late reimbursement of debt interest or principal (Moody's Investor Service, 2015a). We argue that credit agencies are officially only commentators and they are not legally liable for their credit assessment as was pointed out by *The Financial Crisis Inquiry report* (2011). Credit agencies' main revenue streams come from rating fees paid by the rated firm (Kruck, 2011). In less common cases, according to Kruck (2011), they produce ratings from their own initiative. Among the various types of rating, this thesis considers the difference of issuer rating rather than the issue rating together with the long-term view rating rather than short-term rating. In order to measure the creditworthiness of firms, credit agencies use both qualitative and quantitative criteria for risk measurement including (1) Political and Country risk, (2) Industry risk, (3) Company-Specific Business Risk, (4) the Management factor and (5) the Financial risk (Gauguin & Bilardello, 2005). M&A activities imply a high degree of influence on the measurement of risks, resulting in key events for credit rating change:

1. Political and Country risk is affected by cross-border acquisitions (Allee, Mansi & Reeb, 2001)
2. Acquisitions that aim for diversification reduce the industry and business cycle risk (coinsurance hypothesis)

3. Acquisitions decrease the Business Risk by increasing the size of the firm (Ammann & Verhofen, 2006)
4. Good practices in corporate governance guide M&As' transactions and vice-versa governance is formed by these deals (Hall & Norburn, 1987)
5. The financials are altered for both financial statements and the acquisition's method of payment (debt, cash or stock) (Karampatsas, Petmezas & Travlos, 2014)

As King & Sinclair (2001) state, the need for credit assessment derives from the disintermediation of finance that reduces the role of commercial banks as primary source of capital. They further point out that, in today's economy, there is an evident demand for non-bank loans that miss of banks' intermediation and so their credit evaluation. This creates an information asymmetry that for reasons of costs requires to be faced by centralized credit assessment agencies. In this sense, economists agree on the fact that ratings reduce transaction costs on the lender-borrower transaction by efficiently allocate capital (Kruck, 2011). As a result, credit rating has a crucial influence on a firm ability access to capital. An interesting study by Rauh & Sufi (2010) presents evidences that credit rating shapes the capital and debt structure of firms. In particular, low-rated firms tend to engage on multi-tiered structure consisting of bank and non-bank debt, different from high-rated firms that mostly employ bank debt (see Appendix 3).

Moreover, there exist a number of researches that appreciate credit rating as a mean to fulfill the criteria of ideal investment (e.g. Nicolai, Schulz & Thomas, 2010). Although many believe that credit rating is just a lagging indicator (Reuters, 2009), others point out that credit announcements, and therefore the change in the above mentioned points (1 to 5) can flag a prospective positive or negative



trend to the market before the firm's intrinsic firm's profitability is altered (Lagner & Knyphausen-Aufseß, 2012; Dallochio, Hubler, Raimbourg & Salvi, 2006). In other words, after an M&A deal, investors can anticipate a profitability transition because of the rating opinions. If considering the case of Royal Dutch Shell, elements can be noticed that support the fact that credit agencies offer opinions about the credibility and feasibility of M&A's motives. Two days after the acquisition of BG was announced, Moody's decided to include RDS under negative outlook with the intention of examining a potential downgrade (Moody's Investor Service, 2015b) thus creating doubts about the true value creation arising from the deal. Yet, whether these doubts generate statically significant abnormal returns on the stock price remain to be proven.

#### 2.4.2 Effects of Credit Rating Changes

In the case of a traditional rating change, hence when the announcement it is not contaminated by a previous event such as an M&A, findings of previous researches appear varying. Hand, Holthausen & Leftwich, (1992) is one of the most cited studies in this regard. The research accounts a total number of 1133 rating changes (841 downgrades; 292 upgrades) during the period 1977 to 1982. They evidence that downgrades are associated with statistically significant negative abnormal return on the stock price of -1.52% (t stat of -4.11) with 60.1% of the sample showing negative stock returns. Conversely, There is not evidence for significant positive abnormal return on stock price caused by upgrade announcements with only 0.24% returns (t test of 1.13). This analysis is also supported by Liu, Seyyed & Smith, (1999), explaining that whereas the market perceive a deterioration of wealth as signaled by the downgrade announcement, upgrade is perceived as "hold" advice rather than "buy". In addition, Zaima and McCarthy (1988) provided a corporate theory explanation of the above results.

They point out that the statistically insignificant results of upgrades derive from a decline of the overall enterprise riskiness, which signal potential lower returns and the rise of agency costs of managerial incentives. Conversely, there are also studies (Weinstein, 1978) that argue the absence of equity reaction to credit rating change. Nevertheless, it has to be concluded that, although credit agencies stress that their ratings are merely “comments” which do not account for recommendations and do not signal the suitability of an investment (Moody’s Investor Service, 2015c), they certainly do. In the next methodology, we will reconsider the study of Hand et al. (1992) by adding the contamination of (pre-event) M&A announcement and therefore answering the question: Do *investors rely on credit opinions to evaluate the credibility of M&A’s motives?*

### **3. METHODOLOGY**

In this chapter we explain our selection of data, and choice of analysis methods, which have been used to test our hypotheses. We critically analyze the validity and reliability of our results, in order to provide an objective summation of our research.

#### **3.1 Research Design**

As Healy et al. (1992) identify, changes in equity values surrounding M&A deals are often attributed to an unmeasured source of economic gain, such as a synergy. They further posit that “the anticipation of real economic gains is observationally equivalent to market mispricing” (Healy et al., p.146). It is therefore difficult to conceive of a pure stock price study that could resolve the ambiguity in the interpretation of the evidence (Healy et al., 1992). In support of Healy et al.’s prognosis above, this thesis combines event studies for abnormal returns of both stock prices and operating ratios, in order to more fully measure economic impact of CRC announcements.

The starting point of the research lays on the use of event studies as a central methodology. This is because, since 1985 when Brown and Warner introduced significant modifications on the event study methodology of abnormal returns, it has become the most common and preferred method when studying the consequences of an event (Duso, Gugler & Yurtoglu, 2010). This thesis explores two different hypotheses, which entail the use of slightly different approaches as well as underlying analysis. The first evaluates the importance of a credit rating change preceded by a recent M&A in order to examine if any value is created or destroyed by the signaling of such action. Therefore the underlying in this case is

the firms' stock prices and their reaction to the announcement. The second hypothesis seeks to estimate the enterprises' long-term value creation in order to adequately shape an understanding of the relation between credit ratings and value creation. Therefore the underlying in this case are operating figures. The significance of the results is tested using the parametric t-test.

### **3.2 Measuring the impact of CRC announcements on stock prices**

The event study approach follows that of MacKinlay (1997), which has often been cited in other event studies. Credit rating change announcements are the event of interest, since the research purpose is to assess its impact as a signal. It is important to note that at the time of the credit announcement, the stock price has undergone abnormal changes caused by the recent acquisition (Loderer & Martin, 1990). This also helps in capturing the tradeoff between the two signals (M&A completion and CRC announcement) and thereby gauges the importance from an investors' point of view. An event window of 11 days (announcement day  $\pm 5$ ) has been selected in accordance with similarly conducted studies (Duso et al., 2010) and daily data has been retrieved in order to permit the examination of periods surrounding the event. The study include 5 days previous the event day because the information relative to the credit change could have been released some time before from sources different from Eikon Terminal (Reuters, 2015) and 5 days after because the market might take some time to assimilate the signal. If the rating announcement has positive information content we expect above-average market values of equity and vice versa. To find this association, all announcements were initially segmented by upgrade or downgrade status. Abnormal returns (AR) have been calculated in order to assess the event's impact. Cumulative Abnormal Returns (CAR) have been calculated both over time and across securities. See Appendix 4 for a complete list of formulae. To model the

normal return the market model is selected, which represents a potential improvement over the constant mean return model (MacKinlay, 1997). Two categories of tests have been done, one with country-specific benchmark indices for each company, and one using the STOXX 600 Europe Index, which has been used as the most closely represented single index (STOXX, 2015). Due to the international nature of the sample firms, there is no index containing the full list of companies, to our knowledge. An estimation window of 250 days has been chosen, which is a commonly cited requirement for adequate estimation (Bartholdya, Olsonb & Pearec, 2007, Brown & Warner, 1985). A visual diagram of the event study timeline can be seen in Appendix 5. Lastly, parametric t-tests have been conducted to assess the statistical significance of the results. The t-statistic is measured against 1-tailed t-distribution because the two sample categories (upgrade and downgrade announcements) include less than 30 firms (MacKinlay, 1997).

### **3.3 Measuring operational performance**

The methodology used in this thesis to evaluate the CRC announcement's impact on long-term operational performance is similar to studies by Brown & Warner (1985) and Barbel & Lyon (1995). The concept of the event study is the same as outlined in Section 3.2. Main differences in this test are the performance metrics used, and benchmark performance. In addition, the event window has been modified to include the 3 fiscal years following the CRC announcement, which is a benchmark for measuring long-term effects (Barber & Lyon, 1995). The same parametric t-test for significance has been used. The structure of the event study has been organized as follows. Firstly, is an explanation of operating measures selected to signify changes in firm profitability. Secondly, a detailed overview of the benchmark with which to compare actual performance is provided. Lastly, the statistical t-test is implemented. The structure is explained in more detail in

the next sub-sections.

### 3.3.1 Determination of operating features

Return on Assets:

The majority of the studies from 1980 to 1990 advocate the use of earnings per share over price as a proxy for a firm profitability (Healy et al., 1988; Asquith, 1989). The 1990s onwards saw a shift towards the use of operating income over total assets (Denis & Denis 1993, Mikkelson & Shah 1994). We believe return on assets (*ROA*) is a superior performance indicator, and has been used in this study for the following reasons:

- By excluding special items such as interest expense, tax considerations and minority interests, ROA represents a more accurate measure of operating performance.
- By determining ROA rather than EPS, changes in corporate structure deriving from the M&A are disregarded.
- EPS can be skewed by changes in the number of shares outstanding, therefore decreasing its effectiveness.
- Maintaining consistency with other event studies on the impact of credit rating announcements (Altman and Rijken, 2006).

Notably, the comparison across firms has to be made on the base of the productivity at  $t = 1$  deriving from operating assets at  $t = 1$ . Accordingly, operating income has been divided by end of the year book value of assets (a proxy for market value of assets).

The main drawback of ROA is originated by the combination of operating and non-operating assets within total assets. When accounting the book value of

assets, non-operational assets are included that understate the value of the ratio and its effectiveness on comparison. Due to the lack of available information on market value of assets, ROA's accuracy is often less than perfect. Book value of assets has been used in this research as a proxy.

In order to overcome these issues, this thesis proposes two alternatives:

A. Return on Assets adjusted for cash and cash equivalents

To increase the accuracy of our results we should subtract the amount of all non-operating assets from the amount of total assets so that ROA is able to embody a clear productivity analysis of the firm. Although a full separation of assets is the auspicious technique, this thesis adjusts for cash and cash equivalents as non-operating assets. According to Gaughan (2007), it is fair to say that 98% of cash and cash equivalents is attributable to financing activities and therefore does not generate operating income. Also, while C&CE can invest in operating assets, the resulting operating income is likely to be realized in further periods. In conclusion, the second performance measure will be ROA adjusted for cash and cash equivalents. Eventually, we expect analogous results with the traditional ROA.

B. Return on Sales

The second alternative intends to overcome both issues previously mentioned. By scaling operating income to sales (ROS), the weaknesses of using total assets are eliminated as well as it is now possible to consider accountancies belonging to the same financial statement and therefore of same format. Moreover, this ratio mitigates the fact that total assets might be unusually high due to the recent acquisition. However, the disadvantage is that ROS does not measure the profitability of the company because the management can change the amount of operating assets without affecting

the relation between sales and income. Nevertheless, there is another important reason why the ROS is presented in this study. In the literature review we have seen that the two most cited motives for M&A are revenue enhancement and cost cutting, two elements that are centrally included in ROS. Through that, it is interesting the possibility to picture the realization of synergies within our sample.

### 3.3.2 Determining Benchmark Performance

To assess whether a firm is performing abnormally well or poor, Barber and Lyon (1996) suggest comparing the firm's performance measures to a benchmark in order to specify the performances we would expect in the absence of the event. To construct the benchmark we use 3 competitors operating in the same industry so that industries' performance differences are controlled (Appendix 6). In addition, the second main filter considers the similarity in size defined as market capitalization at the time previous the event ( $t=0$ ). In principle we assume that performances vary mainly according to industry and size, assumption supported by the studies of Fama and French (1995), Kaplan (1989).

We also tried to select competitors with comparable historical performance, hence those with a ROA deviation of max  $\pm 10\%$  to the studied firm. Though, in some cases not enough companies fall into this last comparison specification and an enlarged filter was implemented. After the benchmark is selected, it is kept constant during the 3 years length and the average performance for each year is computed. At this point, we encounter the choice of constructing an appropriate level of normal performance. Barber and Lyon propose 3 alternatives: the first, which is not considered in this thesis, compares the sample firm with only its own historical performances  $[N(P_{it}) = P_{it-1}]$ , in our opinion neglecting the competitive environment. The second alternative states that the normal



performance is equal to the average comparison's group performance [ $N(P_{it}) = PB_{it}$ ]. The main disadvantage here is that competitors that are historically more or less profitable due to elements different from the acquisition or the rating, such as specific macroeconomic variables or management ability, they might bias the result. Nevertheless, we try to alleviate this problem by the above-mentioned historical performance matching. The third alternative comes as an evolution of the second, aiming to mitigate its disadvantage. It includes not only the performance of the comparison groups, but also the firm's own historical performance concluding that the normal performance is equal to its past performance plus the change in industry performance [ $N(P_{it}) = P_{it-1} + \Delta PB_{it}$ ]. At the beginning of our research, we applied the last alternative because we believed it was most the most adequate to our scope. However, the fact that the majority of the firms included in our sample experience the economic shock from the financial crisis, led us to realise that normality would be under-over estimated from the firms' past own performances. Therefore, the research finally turned to the second alternative that conveys the most powerful result.

### 3.4 Data Collection Method

Summary information on mergers and acquisition deals has been sourced from Zephyr (2005). The name of the acquiring company, as well as the announcement and completion dates of the M&A deal were the desired outcomes from this data retrieval. The following is an explanation of delimitations imposed on the Zephyr data. The timeframe is from 01/01/2000 until 01/01/2013 for two main reasons. The first motivation was that the European Union was formed in 1999, and we have allowed for a period of market integration before analyzing M&A deals. Secondly was the desire to assess both short- and long-

term impacts on firm value, through analysis of stock returns and performance multiples. As it was previously mentioned, a commonly used benchmark of long-term impact is 3 years, making 01/01/2013 the latest possible deal completion date, in order to effectively assess post-firm value since then. Geographically, our data has been delimited such that: the acquirer is headquartered in the European Union, Western Europe, or Eastern European regions. This decision complies with one of the goals of this study, which is to achieve greater relevance in the continent of Europe. Another requirement was for current deal status to be “completed”, so that post-deal effects would be analyzing a full- and not partial-M&A effects. Likewise, the minimum percentage of the final ownership stake was limited to 100%, meaning that the acquiring company owned the target company outright. All major sectors have been included in the data, except for financials (banks) and other financial institutions (such as insurance companies) because they follow characteristics and financial regulations different from other players. The last requirement was that of a publicly listed acquirer, to allow for easier post-M&a data access and analysis. The aforementioned filters resulted in a total of 20,968 deals of all sizes (\$USD).

Credit rating data has been compiled using Thomson Reuters Eikon software. The credit rating monitor service was utilized in order to find all credit changes within the same time period as the M&A data. The same geographical regions and sectors have been selected, with the purpose of matching credit rating changes to acquirer companies shortly after M&A deals. Rating types have been delimited to the three main CRAs (S&P, Moody’s, Fitch), focusing on Long Term Issuer Ratings. The reason is based on supporting literature, which indicates that rating agencies rate through the cycle, focusing more on long-term debt as a better indicator of issuer performance/default probability, as opposed to short-term debt instruments (Ekins, 2012). A final sample of 31 acquirer companies

has been selected for event study analysis (Appendix 7). These companies have met all of the above criteria, and have had credit rating changes within a maximum of 2 months following an M&A deal. A summary of the data filters applied can be found in Table 1 below. A larger final sample could have been used with less stringent filters, but we believe the current sample encompasses a strong relation between M&A completion and CRC announcement.

*Table 1: Data Filtering*

<b>Filter</b>	<b>Description</b>	<b>Sample</b>
None	All deals	1,281,122
Geography	Acquirer based in European Union, Eastern Europe, Western Europe	627,665
Deal Status	Completed – confirmed	456,359
Sectors	All except financials (banks) and financial institutions (e.g. insurance companies)	420,738
Ownership Stake	100% Final Ownership	168,085
Timeframe	All deals between Jan.1, 2000 and Jan.1, 2013	109,970
Firm Structure	Publicly listed acquirer	20,968
Credit Rating Change	Credit rating Upgrade or Downgrade from Moody's, S&P's, or Fitch's Long Term Rating Service within 2 months of deal completion	<b>31</b>

## 4. RESULTS AND ANALYSIS

Often, event studies look at the effects of stocks on a single index (Brown and Warner, 1985; MacKinlay, 1997). Due to the large geographical selection in this study, a single index containing all 31 companies does not exist. The STOXX Europe 600 however, contains 29 of the sample firms, and has been used as the closest alternative. Two scenarios are tested: (1) Separate Indices and (2) Common Index, so that any important differences are accounted for. Scenarios are further subdivided into event day and event window estimates. Once again, an 11-day event window has been used, to account for any lag in the announcement date, and stock market impact. In testing the impact on both stock returns and operational performance, statistical significance is analyzed against the null hypothesis. In the context of this research, the null hypothesis states that there is *no* abnormal impact on stock returns or operational performance due to CRC announcements.

### 4.1 Abnormal Returns of Stock Prices

#### (A) Separate Indices

In the first scenario, each acquiring firm's stock is compared with the main country-specific index that it is listed on. For example, Statoil ASA is compared with the Oslo Stock Exchange since it is a Norwegian company, Nestle SA is compared with the Swiss Market Index, and so on. Results of this scenario indicate significant abnormal returns at the 99% confidence level for event day upgrades (T1), however no other significance for event day upgrades or downgrades in abnormal returns (ARs) or cumulative abnormal returns (CARs). By contrast, the event window averages show greater significance in the 3

remaining tests: upgraded firm's CAR (T6), downgraded firm's AR (T7) and CAR (T8). Although none of the tests in this case are significant at the 90% confidence level, we observe greater overall significance in measuring the event windows for separate indices. Since the null hypothesis has been only rejected once out of a possible 8 times during this scenario, a low level of statistical significance is concluded. We cannot fully conclude that CRC announcements have a statistically significant impact on share prices. It would appear therefore, that shareholders do not currently place a high level of importance on these announcements. Appendix 8 summarizes the significance in a chart.

**Scenario 1: Separate Indices**

\*test numbers indicated in parentheses

<b>Event Day</b>						
	<b>Avg. AR</b>	<b>T-Statistic (AR)</b>	<b>Significance (1-tailed test, T-dis'n)</b>	<b>Avg. CAR</b>	<b>T-Statistic (CAR)</b>	<b>Probability (1-tailed test, T-dis'n)</b>
Upgrades (n=14)	0.90%	3.03	(T1) 0.0045	0.39%	0.52	(T2) 0.3069
Downgrades (n=17)	-0.44%	0.37	(T3) 0.3584	0.46%	0.39	(T4) 0.3496

<b>Event Window</b>						
	<b>Avg. AR</b>	<b>T-Statistic (AR)</b>	<b>Probability (1-tailed test, T-dis'n)</b>	<b>Avg. CAR</b>	<b>T-Statistic (CAR)</b>	<b>Probability (1-tailed test, T-dis'n)</b>
Upgrades (n=14)	0.11%	1.19	(T5) 0.1271	0.59%	0.86	(T6) 0.2010
Downgrades (n=17)	-0.11%	0.84	(T7) 0.2068	-0.64%	0.89	(T8) 0.1934

(B) Common Index

In the second scenario, all firms are compared against the STOXX Europe 600, an index of small, mid, and large cap companies throughout 18 countries in Europe (STOXX, 2015). We observe smaller abnormal returns almost unanimously in scenario two, which are due to smaller expected returns of the STOXX 600 in our sample. A similar observation can be seen, whereby all tests become more

significant during tests of the event window, with the exception of abnormal returns for event day upgrades (T9). We acknowledge that there could be an outlier in the sample of upgraded firms, in our Limitations section 5.2. Results show an absence of statistical significance for all tests, and once again suggests that shareholders do not base investment decisions on CRC announcements post-M&A. An interesting trend can be seen between the event day (T9 to T12) and event window (T13 to T16) subcomponents in this scenario, whereby the downgraded firms' ARs and CARs increase in significance from 36.55% (T11) and 19.86% (T12), respectively, to 14.16% (T15) and 11.26% (T16), respectively. Although we are unable to reject the null hypothesis here, this might suggest that shareholders are more prone to selling their ownership stake during the week of a CRC announcement. This notion has been supported by previous studies, which we explain further in section 4.2. See Appendix 9 for a graphical representation of these effects.

#### Scenario 2: Constant Index

\*test numbers indicated in parentheses

<b>Event Day</b>						
	<b>Avg. AR</b>	<b>T-Statistic (AR)</b>	<b>Probability (1-tailed test, T-dis'n)</b>	<b>Avg. CAR</b>	<b>T-Statistic (CAR)</b>	<b>Probability (1-tailed test, T-dis'n)</b>
Upgrades (n=14)	0.41%	1.11	(T9) 0.1419	4.20237E-05	0.01	(T10) 0.4979
Downgrades (n=17)	-0.41%	0.35	(T11) 0.3655	-1.13%	0.87	(T12) 0.1986

<b>Event Window</b>						
	<b>Avg. AR</b>	<b>T-Statistic (AR)</b>	<b>Probability (1-tailed test, T-dis'n)</b>	<b>Avg. CAR</b>	<b>T-Statistic (CAR)</b>	<b>Probability (1-tailed test, T-dis'n)</b>
Upgrades (n=14)	0.05%	0.40	(T13) 0.3472	0.19%	0.25	(T14) 0.4030
Downgrades (n=17)	-0.15%	1.11	(T15) 0.1416	-0.94%	1.26	(T16) 0.1126

## 4.2 Abnormal Performance of Operational Measures

When the sample of rating changes is analyzed to detect abnormal operational performances, the results are contrasting. For example, for downgrades we notice negative significant abnormal performance on both profitability ratios and improved, weaker ROS. Instead, for upgrades we observe positive insignificant performance for profitability ratios along with deteriorated mainly insignificant ROS. Table 2 (a;b) provides the information arisen from the study. In Panel A for downgrades, the Return on Assets shows that year 1 and 2 are the most dramatic in terms of profitability, with losses of 1.63% (t-test -2.20) and 2.18% and (t-test -2.85), respectively. Year 3 stands out with only 24% to 35% from year 2 to year 3. In general, during the 3-years period, firms have lost in average 4.05% (t-test -3.16) of their profitability when compared to competitors that did not embark on M&A activities, which caused rating change, with only 12% of them realizing positive cumulative amelioration. The second alternative (ROA cash adjusted) presents very similar results, as we anticipated before the empirical study. It confirms a negative trend with a vaguely improvement in year 3. Paradoxically, the third alternative (ROS), ratio that should proxy the realization of synergies, shows opposite results. Albeit insignificant or very week significance (year 3), firms had in average experienced more efficient income over sales. However with approximately 55% of them facing lower-than-benchmark performance and negative median in all 3 years, the majority of the firms encounter losses still. The reason why the increment in ROS is not complemented by similar results in profitability might be explained by what sometimes analysts name “quality of synergy”(Bloomberg, 2015). According to this opinion, the realization of whatever synergy does not ensure a successful acquisition.

Table 2a

**Mean and Median, M&A Contaminated, Abnormal and Cumulative Performance of Fundamentals for Sample of Firms with Rating Downgrade Announcement by Moody's, S&P and Fitch during 2000 to 2013.**

*Abnormal performance is defined as actual performance minus benchmark performance. The window runs between the fiscal year in which the credit announcement takes place, the year after and the year after that. The Cumulative Abnormal performance is defined as the sum of a firm's abnormal returns. The t-statistic is given in parenthesis below the mean % abnormal performance.*

<b>Panel A: Indicated Downgrades</b>							
	Year	No. of Firms	Mean % Abnormal Performance	Median % Abnormal Performance	Mean % Cumulative Abnormal Performance	Median% Cumulative Abnormal Performance	Percent of Abnormal Performance > 0
		17					
ROA	1		-1.63% (-2.20)*	-1.40%			29%
	2		-2.18% (-2.85)	-0.60%			24%
	3		-0.25% (-0.30)	-3.61%			35%
					-4.05% (-3.16)	-3.61%	12%
ROA cash adjusted	1		-1.93% (-2.28)	-2.65%			24%
	2		-2.69% (-2.98)	-1.66%			24%
	3		-0.80% (-0.84)	-0.84%			29%
					-5.41% (-3.38)	-4.08%	12%
ROS	1		1.39% (0.71)	-0.79%			41%
	2		1.05% (0.59)	-1.52%			41%
	3		1.63% (1.21)	-0.91%			41%
					4.07% (0.87)	-0.59%	47%

\*The t-statistic for the mean return is based on the cross-sectional standard deviation of abnormal returns.

\*The t-statistic indicates significance at 10% when > 1.740



Panel B indicating upgrades shows though insignificant yet positive trend of profitability. In year 1, we find an average surplus of 1.43% (t-stat 0.57) with a median of 1.14% and 64% of the sample with above-benchmark performance. From year 2, we notice an inversion towards loss with abnormal positive average performance of only 0.76% (t-test 0.32) and negative 0.72% (t-test -0.43) in year 3, both statistically not significant. The Cumulative Abnormal Performance as well not significant but with positive sign 1.47% (t-stat 0.26) and 1.71% for average and median, respectively. The second ratio follows the traditional ROA and does not show any additional information. Curiously, ROS follows an opposite path than the one we saw for downgrades. We find average abnormal performance of -0.79% (t-test -0.21), -1.83% (t-test -0.77) and -2.56% (t-test -1.52) for year 1, 2 and 3 respectively. Above all, year 3 shows the lowest point with actually some but weak significance. In all years and cumulative too we see coincidence of average and mean.

We conclude that a credit rating downgrade is much more powerful on anticipating a profitability trend than a credit rating upgrade does, partly contradicting Hypotheses 2. From our sample, we find evidences that a credit rating downgrade statistically deteriorate the profitability of a firm with signs of recovery on the long run, whereas although it shows a positive inclination, we cannot attach any value creation to upgrades. Because of the ROS, we also find that the realization of cost reduction or revenue enhancing synergies do not ensure value creation. This conclusion comes as an affirmation of previous studies (see chapter 2; credit rating) and therefore we support shareholders to perceive, with due care, a view on “sell” for downgrades and a “hold” for upgrades. Lastly, we tempt manager to reconsider the motives of an M&A when it involves a rating downgrade as well as to carefully reduce the importance of an upgrade as financial motive.

Table 2b

**Mean and Median, M&A Contaminated, Abnormal and Cumulative Performance of Fundamentals for Sample of Firms with Rating Upgrade Announcement by Moody's, S&P and Fitch during 2000 to 2013.**

*Abnormal performance is defined as actual performance minus benchmark performance. The window runs between the fiscal year in which the credit announcement takes place, the year after and the year after that. The Cumulative Abnormal performance is defined as the sum of a firm's abnormal performance. The t-statistic is given in parenthesis below the mean % abnormal performance.*

<b>Panel B: Indicated Upgrades</b>						
Year	No. of Firms	Mean % Abnormal Performance	Median % Abnormal Performance	Mean % Cumulative Abnormal Performance	Median% Cumulative Abnormal Performance	Percent of Abnormal Performance > 0
	14					
ROA	1	1.43% (0.57)*	1.14%			64%
	2	0.76% (0.32)	0.63%			57%
	3	-0.72% (-0.43)	0.56%			57%
				1.47% (0.26)	1.71%	57%
ROA cash adjusted	1	1.33% (0.47)	1.15%			64%
	2	1.03% (0.39)	0.84%			57%
	3	-0.87% (-0.45)	0.90%			57%
				1.49% (0.23)	3.77%	57%
ROS	1	-0.79% (-0.21)	-1.60%			50%
	2	-1.83% (-0.77)	-1.89%			43%
	3	-2.56% (-1.52)	-3.50%			43%
				-5.17% (-0.77)	-7.92%	50%

\*The t-statistic for the mean return is based on the cross-sectional standard deviation of abnormal returns.

\*The t-statistic indicates significance at 10% when > 1.761

### 4.3 Connecting our Findings to Literature

In empirical studies referenced earlier, evidence from credit rating changes has shown greater significance in share price returns due to rating downgrades, than upgrades (Hand et al., 1992; Liu & Seyyed, 1999; Zaima & McCarthy, 1988). As mentioned in the literature review, this research has analyzed the wealth deterioration (Liu & Seyyed, 1999), corporate theory perspectives (Zaima & McCarthy, 1988) and event studies (Hand et al., 1992) of CRC announcements on standalone firms, without the prior occurrence of a recent M&A deal. Our tests on CRC announcements, which are preceded by M&A deals, show some common characteristics with these previous findings. When measured against a common stock index, as has been done in previous studies, our results show greater statistical significance in both ARs and CARs for downgraded firms than upgraded. There are two important caveats to note, however. First, is that our similar findings only occur in tests of the average AR and CAR during the event window, as opposed to the event day itself. This could indicate a time-delay between the CRC announcement and decision by shareholders to sell, however it cannot be compared to previous studies on an exact basis. Secondly, is that none of our downgraded findings are statistically significant at the 90% confidence level, which prevents us from rejecting the null hypothesis. Barring limitations, one might conclude from a comparison of this study and Hand's previous research, that shareholders place a greater emphasis on announcements of downgrades under normal business circumstances, than when preceded by recent M&A deal completion.

Furthermore, it is interesting to notice the consistence between Hand's study, this thesis's findings on abnormal returns and those on abnormal performance. In particular, the relation between the reactions of stock price, hence the information conveyed by the rating change, is proportional to actual trend of

long-term performance. Seems that share price incorporates and reflect all relevant information. In general terms, this thesis highlight that credit rating change, contaminated or not contaminated by other events, represent an accurate signal for resource allocation that when considered together with the consequent change in stock price, confirms the efficient market hypothesis (Fama, 1970). As a result, the research assesses a meaningful importance of credit rating change as criteria for ideal investment and successful M&A.

## 5. CONCLUSION

Results of this study have been critically analyzed and summarized. This section presents concluding statements on the validity and connectedness with existing research, and how future research can improve the accuracy and reliability of results.

### 5.1 Findings and Implications

This research project has argued that, in the wake of contrasting theories about success factors of M&A transactions, more emphasis should be placed on an unbiased indicator. The proposed signal- credit rating change announcements post-M&A, has been vetted through two event studies to analyze its impact on abnormal performance. The first study has shown that, based on the largely insignificant abnormal stock price changes, shareholders do not currently base their investment decisions on the announcements of credit rating changes after an M&A has been completed. The second study has shown statistical significance on the long-term performance of firms upon receiving a downgrade, confirming part of the second hypothesis (H2). This indicates that shareholders and management *should* place more emphasis on the opinion of credit rating agency opinions, as downgrade announcements have been shown to correspond with poorer long-term performance.

Results of this study could support the decision-making process of shareholders and management during the due diligence stage of an M&A proposal. Earlier constraints were identified, in the form of information asymmetry, management self-interest, and difficulty in evaluating potential synergies. Such inconsistent success throughout M&A's rise in prominence could benefit from an unbiased signal as we have identified. While the results of this study have shown some significance and commonalities with previous literature, a number of limitations

are also evident, which are explained next. Such factors could have material impact on the applicability and validity of the results.

## 5.2 Limitations and Suggestions for Future Research

This section identifies the limitations in research design and methodology of the study, and provides suggestions for improvements in future research.

- First and perhaps foremost, was the small sample size. As outlined in Section 3.4, the number of transactions was delimited using numerous filters, resulting in a final sample size of only 31 firms/transactions. Following the example from MacKinlay's event study, a minimum 30-firm sample has been deemed sufficiently large (MacKinlay, 1997), which also qualifies the use of normal distributions in hypothesis testing. Since the 31-firm aggregate was further segmented into upgrades ( $n = 14$ ) and downgrades ( $n = 17$ ), more degrees of freedom were lost, which further compounded this issue. Rigorous filters were applied to the list of credit rating change announcements, in order to coincide with a recently completed M&A transaction. Further studies could increase the sample size therefore, by loosening the filter requirements.
  
- This study does not look at the degree of upgrade/downgrade announcements, and is therefore limited in its universality. We believe that future research would benefit from more closely analyzing the *degree* of abnormal firm performance based on the *degree* of credit rating changes. For example, testing the impact of a 1-notch credit rating downgrade post-M&A versus a 2-notch downgrade.

- We have not analyzed the degree to which long-term performance changes correspond to the premium paid by the acquiring firm. If a 50% premium is paid for example, management and shareholders expect this to be recovered in incremental operating performance. In that respect, it is not sufficient to test just for any abnormally large economic benefit. Future studies should also compare it to the initial premium paid in the M&A, in order to understand the net present value of the transaction.
  
- As seen in both scenario 1 and 2 of Section 4.1, the statistical significance of upgraded firms' ARs is the lowest (most significant) when looking at the event day, however increases drastically when the 11-day event window is averaged, while all other tests become more statistically significant. This could suggest the presence of an outlier or anecdotally large return in one of the upgraded firms on the event day. Future studies could benefit from regression analysis in order to test for significant ARs and CARs, while incorporating *long returns* to reduce the effect of outliers.
  
- By using separate indices, large stocks can have a great influence on the movement of relatively small country-specific indexes. Statoil ASA, for example, represents >50% of the total value of the Oslo Stock Exchange, and would unduly cause large corresponding changes in the index.

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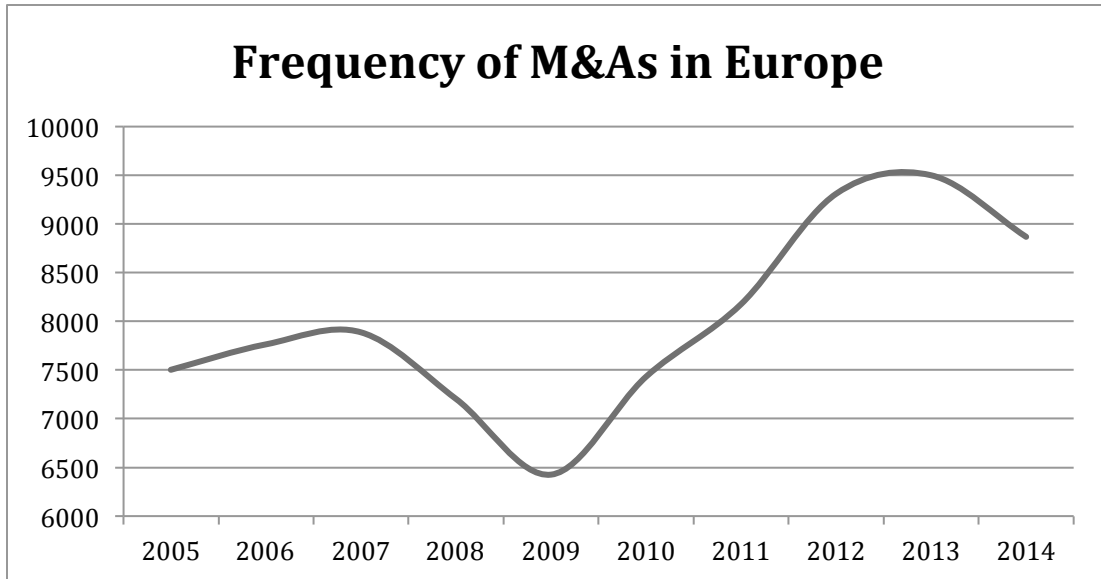
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## Appendices

Appendix 1: Number of M&A deals in Europe from 2005 to 2014 (Zephyr, 2015)



Appendix 2: Theoretical Motivations for Pursuing M&A

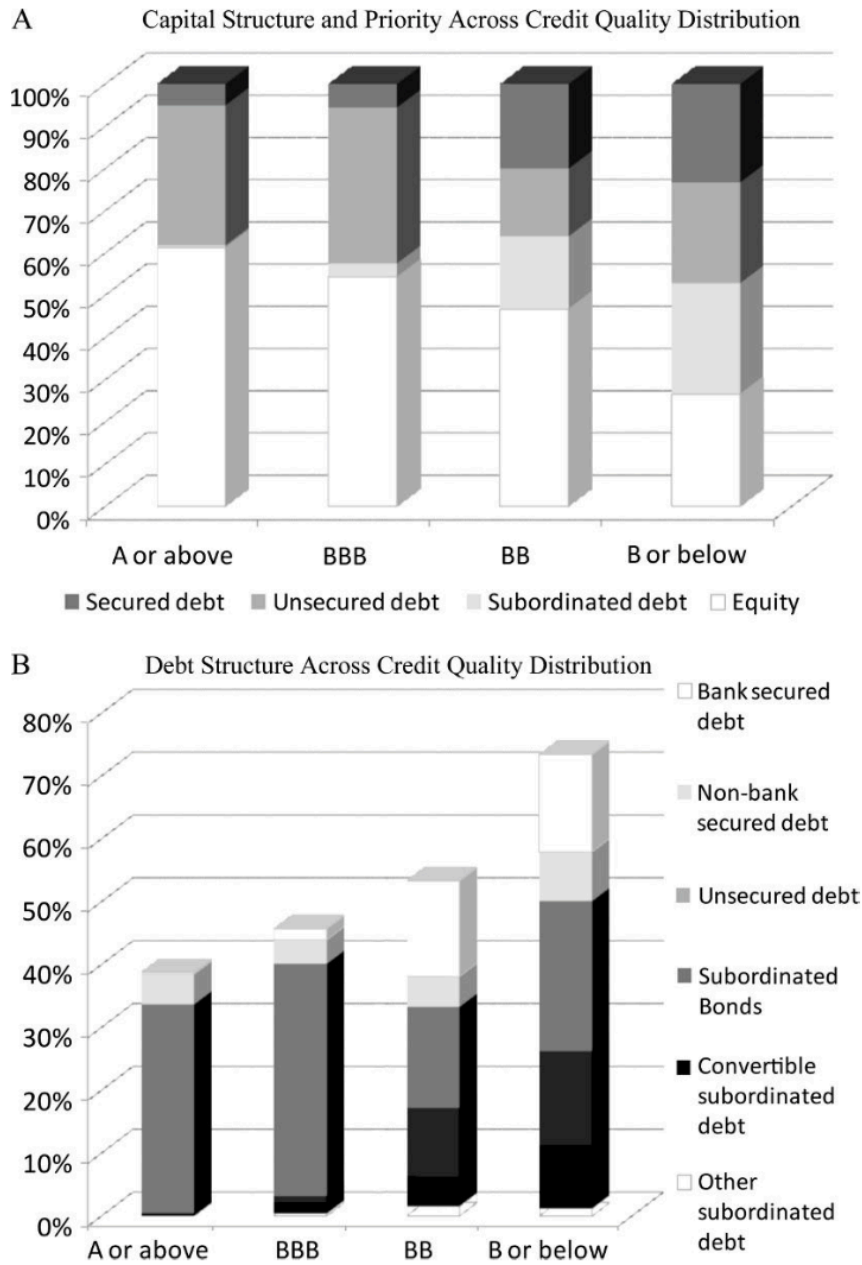
<b>Gaughan</b>		<b>Trautwein via Risberg</b>		<b>Ogden</b>
<p><b>Expansion</b></p> <ul style="list-style-type: none"> <li>Acquiring a company in line with the business or geographic area that the company might want to expand is an alternative during slower organic growth.</li> </ul>		<p><b>Monopoly Theory</b></p> <ul style="list-style-type: none"> <li>“Views mergers as being planned and executed to achieve market power. This cannot only occur in horizontal organizations (Risberg, p.10).”</li> </ul>		<p><b>Self-interest from the bidder</b></p> <ul style="list-style-type: none"> <li>Amihud and Lev (1981) found evidence of managers engaging in mergers to decrease their employment risk                             <ul style="list-style-type: none"> <li>Further suggest that they are more likely to do this if ownership is diffuse</li> </ul> </li> <li>Lewellen, Loderer, and Rosenfeld (1989) consider that managers are motivated to merge to reduce the firm’s riskiness</li> </ul>
<p><b>Synergies</b></p> <ul style="list-style-type: none"> <li>Sum of the combined parts of both firms is greater than the individual components</li> <li>In other words, <math>1 + 1 = 3</math></li> </ul>		<p><b>Efficiency Theory</b></p> <ul style="list-style-type: none"> <li>Mergers are “planned and executed to achieve synergies (Risberg, p.9).”</li> <li>Financial, operational, managerial synergies</li> <li>“In sum, the efficiency theory’s record is unfavourable. It appears to be consistent with stock market quotations but far less with companies’ actual performance. If one regards financial statements as more reliable than stock prices the efficiency theory has to be rejected. However, if one assumes the capital market to be efficient the theory can be held...(p.10).”</li> </ul>		<p><b>Financial synergy and diversification</b></p> <ul style="list-style-type: none"> <li>Occurs when the market value of the merged firms has a greater market value of the separate firms.</li> </ul> <p><b>Operating synergy</b></p> <ul style="list-style-type: none"> <li>Improvements in any business function, including management, labour costs, production or distribution, resource acquisition and allocation, or market power (Bradley, Desai,</li> </ul>



				Kim, 1983).
<b>Financial</b> <ul style="list-style-type: none"> <li>• Signalling that the target company is undervalued</li> </ul>	↔	<b>Valuation Theory</b> <ul style="list-style-type: none"> <li>• “Mergers are planned and executed by managers who have better information about the target’s value than the stock market (Steiner, 1975; Holderness and Sheehan, 1985; Ravenscraft and Scherer, 1987). Bidders’ managers may have unique information about possible advantages to be derived from combining the target’s businesses with their own. Or they may have detected an undervalued company that only waits to be sold in pieces (p.11).”</li> </ul>	↔	<b>Bankruptcy Avoidance</b> <ul style="list-style-type: none"> <li>• Firm might agree to be acquired because it’s close to bankruptcy, and acquisitions avoid deadweight costs of bankruptcy (Haugen and Senbet 1978)</li> <li>• 15.2% of target firms in a sample by Shrieves and Stevens (1979) were close to insolvency</li> </ul>
<b>Diversification</b> <ul style="list-style-type: none"> <li>• Reduce over-exposure on fewer areas by entering new lines of business</li> </ul>	↔	<b>Empire-building Theory</b> <ul style="list-style-type: none"> <li>• In tune with agency theory, this suggests managers seek to “maximize their own utility instead of their shareholders’ value. This approach has its roots in the original study on the separation of ownership and control in the corporation (Berle and Means, 1933).”</li> </ul>	↔	<b>Financial Slack</b> <ul style="list-style-type: none"> <li>• Pecking Order Hypothesis provides a motive for firms with large investment opportunities but low cash, to merge with a company with the opposite profile (Myers and Majluf, 1984; Bruner, 1988; Hubbard and Palia, 1999)</li> </ul>
		<b>Process Theory</b> <ul style="list-style-type: none"> <li>• Mergers are the result of limited processing capabilities, organizational routines, and political games more than rationale decision-making</li> <li>• “Even less evidence relating to the process theory than to the empire-building theory. The scarcity of direct evidence can be seen as being caused by merger makers’ attempts to rationalize</li> </ul>	↔	<b>Hubris</b> <ul style="list-style-type: none"> <li>• Proposed by Roll (1986)</li> <li>• Management overvalues their ability to create value once acquiring the target company’s assets</li> <li>• At the announcement of the acquisition, the</li> </ul>

		their actions (p.13).”		<p>overall change in the market values of the firms should be zero (or even negative, since the transaction is costly)</p> <ul style="list-style-type: none"> <li>• Evidence shows that valuation effects of acquisition announcements see target-firm shareholders receiving large positive ARs, while those for bidder firms are generally negligible (Roll, 1986)</li> </ul>
		<p><b>Disturbance Theory</b></p> <ul style="list-style-type: none"> <li>• Merger waves are “caused by economic disturbances (p.14).”</li> <li>• Not theoretically sound, because we see that previous waves are caused without economic disturbances, and also that disturbances don’t necessarily result in M&amp;A waves</li> </ul>		
		<p><b>Raider Theory</b></p> <ul style="list-style-type: none"> <li>• Describing a manager “who causes wealth transfers from stockholders of the companies he bids for (p.14).”</li> <li>• This theory holds very unfavourable evidence- a study of 69 mergers initiated by some of the largest raiders show returns of 8-30% for target company shareholders</li> </ul>		

### Appendix 3: Capital and Debt Priority Structure (Rauh & Sufi, 2010)

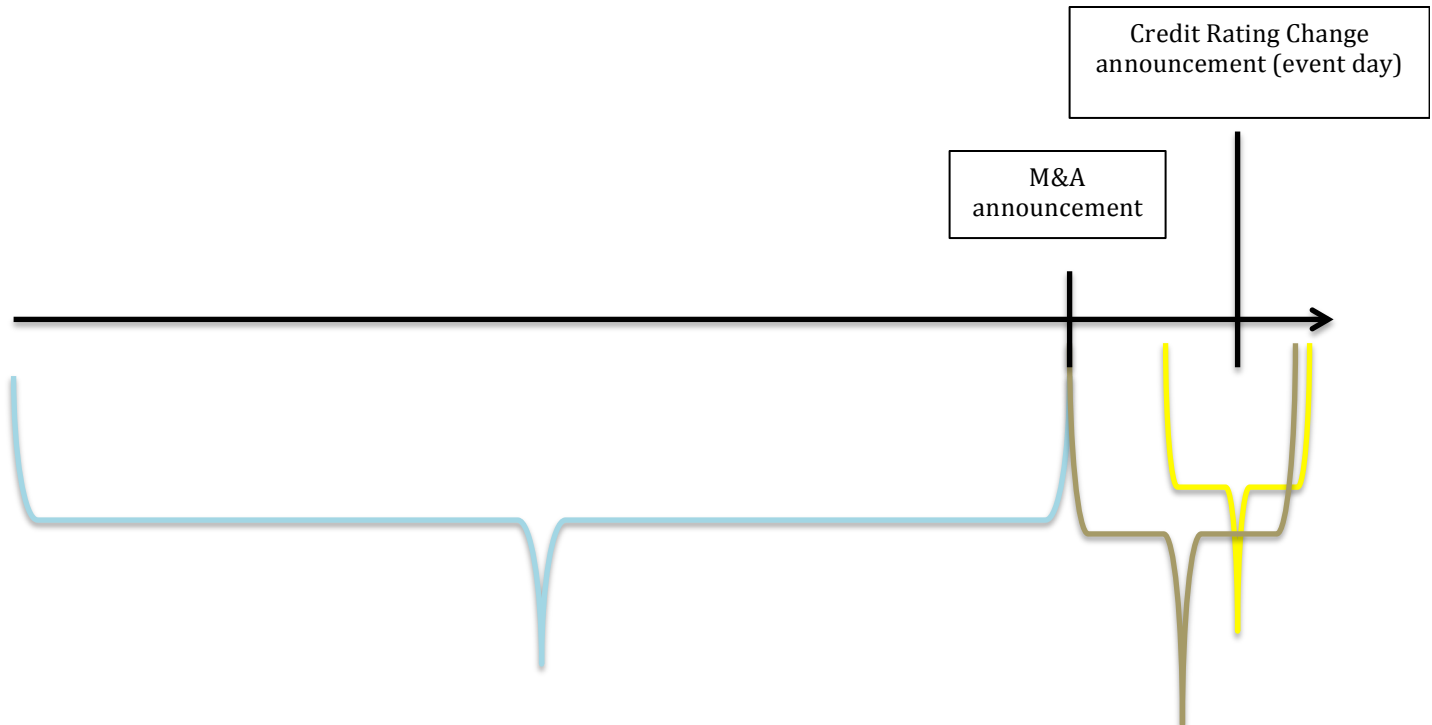


**Figure 1**  
**Priority structure of debt and credit ratings**  
 These figures show the priority structure of debt by credit rating for the 1,829 rated firm-year observations on the 305 firms in the random sample.

#### Appendix 4: Share Price Event Study Formulae

<p><b>Market Model for Normal Performance:</b>  <math>R_{it} = a_i + \beta_i R_{mt} + \varepsilon_{it}</math></p> <p><b>Calculation for sample abnormal returns:</b>  <math>AR_{it} = R_{it} - \hat{a}_i - \hat{\beta}_i R_{m\tau}</math></p> <p><b>Calculation for cumulative abnormal returns:</b>  <math display="block">CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{it}</math></p> <p><b>Test Statistic:</b>  <math display="block">\theta_1 = \frac{\overline{CAR}(\tau_1, \tau_2)}{var(CAR(\tau_1, \tau_2))^{1/2}} \sim T(0,1)</math></p>	<p>Where:</p> <p><math>R_{it}</math> = period-t returns on security <math>i</math></p> <p><math>R_{mt}</math> = period-t returns on market portfolio</p> <p><math>\varepsilon_{it}</math> = disturbance term</p>
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#### Appendix 5: Share Price Event Study Timeline



Appendix 6:  
Competitors

250 days estimation window

List of

11-day event window

60 days from M&A  
announcement

**List of Firms 1-31 (in bold) with chosen Benchmark List**

**ABB Ltd**

Schneider Electric SE  
Atlas Copco AB  
Philips NV

**Akzo Nobel NV**

Solvay SA  
Koninklijke DSM NV  
Syngenta AG

**Atlas Copco AB**

Fanuc Corp  
Konw Oyj  
Sandvik AB

**BASF SE**

Air Liquid SA  
Linde AG  
Syngenta AG

**Compass Group PLC**

Sodexo SA  
Whitbread PLC  
Accor SA

**CRH PLC**

Holcim Ltd  
Compagnie de SG SA  
Lafarge SA

**Daimler AG**

Volkswagen AG  
Bayerische Motoren AG  
Renault SA

**Electricite De France SA**

Engie SA  
RWE AG  
Enel SpA

**Eni Spa**

Statoil ASA  
BG Group PLC  
Repsol SA

**FirstGroup PLC**

StageGroup PLC  
Go-Ahead PLC  
National Express PLC

**Fresenius Medical Care AG**

Fresenius SE  
Smith PLC  
Sonova AG

**G4S PLC**

Securitas AB  
Hays PLC  
Serco PLC

**GlaxoSmithKline PLC**

Bayer AG  
Novo AS  
Sanofi SA

**Norilskii Nikel OAO**

Severstal PAO  
Eyrac PLC  
Novolipetsk OAO

**Henkel AG & Co. KGAA**

Reckitt Group PLC  
Colgate-Palmolive  
Kimberly-Clark

**Koninklijke KPN NV**

Belgacom NV  
Swisscom AG  
Telefonica SA

**Philips NV**

Abb Ltd  
Schneider Electric SE  
Legrand SA

**National Grid PLC**

SSE PLC  
Centrica PLC  
RWE AG

**Nestle SA**

Unilever NV  
L'Oreal  
Danone

**NOVOLIPETSKII OAO**

Severstal PAO  
Evraz plc  
Polyus Gold Int

**NORSK HYDRO ASA**

Boliden AB  
Antofagasta PLC  
Rio Tinto PLC

**SCHNEIDER ELECTRIC SA**

ABB Ltd  
Philips NV  
Legrand SA

**SMITHS GROUP PLC**

Weir Group PLC  
IMI PLC  
Spectrics PLC

**SOLVAY SA**

Akzo NV  
DSM NV  
Syngenta AG

**STATOIL ASA**

Eni SpA  
BG Group PLC  
Repsol SA

**STORA ENSO OYJ**

UPM-Kymmene Oyj  
Smurfit Kappa PLC  
Svenska Cellulosa AB

**LM ERICSSON**

Alcatel SA  
Nokia Oyj  
Motorola Inc

**VINCI SA**

Compagnie de SG SA  
Eiffage SA  
Hochtief AG

**VODAFONE GROUP PLC**

Deutsche Telekom

**VOLVO AB**

Paccar Inc

**WHITBREAD PLC**

InterContinental Hotels

Telefonica SA  
BT Group PLC

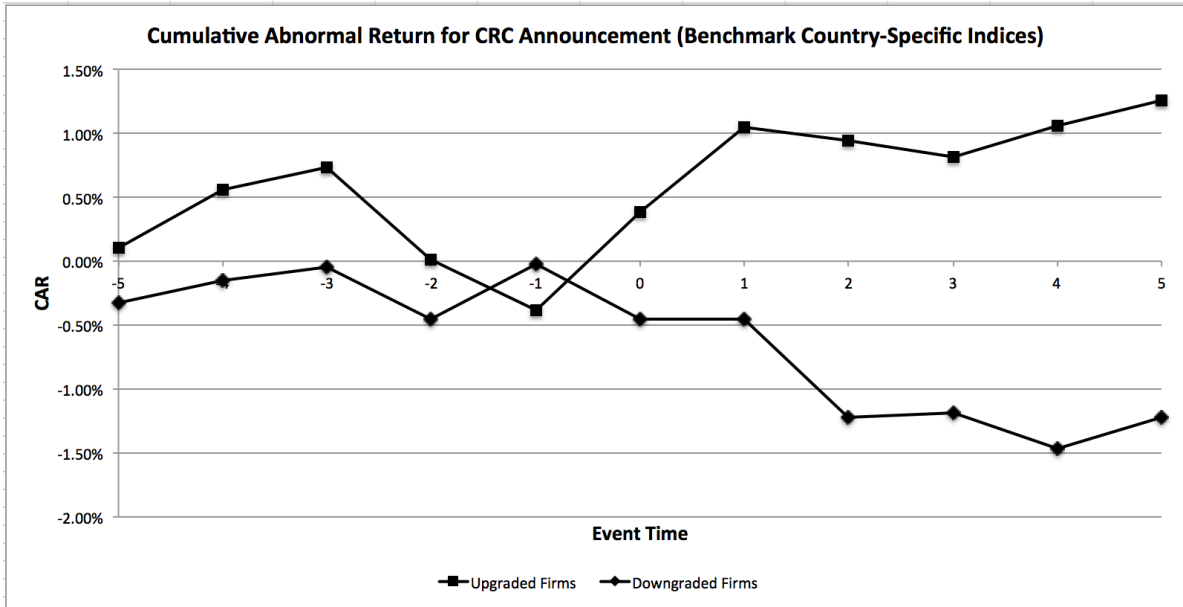
Man SE  
Scania AB

Accor SA  
Sodexo SA

## Appendix 7: Data Collection

Name	Industry	Credit Change	From	To	Agency	Credit Announcement	Time Btw M&A and Credit Change
ABB LTD	Electrical Equipment	Downgrade	A	A-	Fitch	03/06/2011	Nil
AKZO NOBEL NV	Chemicals Industrial	Downgrade	A-	BBB+	S&P	25/02/2009	1 m
ATLAS COPCO AB	Equipment	Upgrade	A-	A	S&P	24/02/2011	Nil
BASF SE	Chemicals	Upgrade	B	A+	Fitch	13/12/2010	1 m
COMPASS GROUP PLC	Support Service	Upgrade	BBB+	A-	S&P	26/07/2012	1 m
CRH PLC	Building Materials	Downgrade	BBB+	BBB	Fitch	05/10/2010	2 ms
DAIMLER AG	Automotive	Upgrade	BBB+	A-	Fitch	10/06/2011	2 ms
ELECTRICITE DE FRANCE SA	Electric Utility	Downgrade	AA-	A+	S&P	17/01/2012	Nil
ENI SPA	Oil and Gas	Downgrade	A2	A3	Moody's	16/07/2012	Nil
FIRSTGROUP PLC	Trasportation	Downgrade	BBB	BBB-	S&P	23/04/2007	Nil
FRESENIUS MEDICAL CARE AG	Health Care	Downgrade	Ba1	Ba2	Moody's	30/05/2005	2 ms
G4S PLC	Security	Downgrade	BBB	BBB-	S&P	05/11/2012	1 m
GLAXOSMITHKLINE PLC	Pharmaceutical	Downgrade	AA-	A+	Fitch	21/04/2009	Nil
KOMPANIYA NORILSKII	Intensive						
NIKEL OAO	Manufacturing	Upgrade	BB+	BBB-	S&P	08/08/2006	1 m
HENKEL AG & CO. KGAA	Personal Care	Upgrade	A-	A	Fitch	03/06/2011	2 ms
KONINKLIJKE KPN NV	Telecommunication	Downgrade	BBB	BBB-	Fitch	17/12/2012	2 ms
KONINKLIJKE PHILIPS NV	Electronics	Upgrade	A-	A	Fitch	26/10/2010	2 ms
NATIONAL GRID PLC	Utilities	Downgrade	A	A-	S&P	24/08/2007	1 m
NESTLE SA	Food	Downgrade	AAA	AA+	S&P	16/08/2007	1 m
NOVOLIPETSKII KOMBINAT OAO	Intensive Manufacturing	Upgrade	BB+	BBB-	Fitch	19/05/2011	Nil
NORSK HYDRO ASA	Metals	Upgrade	BBB-	BBB	S&P	19/11/2010	Nil
SCHNEIDER ELECTRIC SA	Electrical Equipment	Upgrade	BBB-	A-	S&P	26/11/2008	2 ms
SMITHS GROUP PLC	Engineering	Downgrade	A-	BBB+	S&P	15/01/2007	1 m
SOLVAY SA	Chemicals	Downgrade	A-	BBB+	S&P	07/09/2011	Nil
STATOIL ASA	Oil Stations	Upgrade	A+	AA-	S&P	03/08/2007	Nil
STORA ENSO OYJ	Packaging	Downgrade	BB+	BB	S&P	14/05/2009	1 m
LM ERICSSON	Telecommunication	Upgrade	BBB-	BBB+	S&P	15/06/2007	1 m
VINCI SA	Construction	Upgrade	BBB	BBB+	Fitch	26/02/2004	1 m
VODAFONE GROUP PLC	Telecommunication	Downgrade	A+	A-	S&P	30/05/2006	Nil
VOLVO AB	Heavy Equipment	Upgrade	BBB-	BBB	S&P	15/04/2011	Nil
WHITBREAD PLC	Leisure	Downgrade	BBB+	BBB	Fitch	27/07/2004	1 m

Appendix 8: Average CAR in 11-day event window (Separate Indices)



Appendix 9: Average CAR in 11-day event window (Common Index)

