The announcement effect of cross-border M&A on shareholders' value:

An event study of Scandinavian target firms

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Summary

The majority of research on merger and acquisition (M&A) in Scandinavia is related to domestic M&A. In addition to a lack of research on cross-border M&A for the Scandinavian market, the many obstacles associated with this form of take-overs make it fruitful to investigate the phenomenon in Scandinavia. This thesis investigates the announcement effect of cross-border mergers and acquisitions (M&A) on target firm shareholders' value in Scandinavia in the short-term. A short-run perspective is chosen in order to isolate the impact of one particular event by preventing cofounding events during the event period. Evidence on long-run effects is therefore left out of the analysis. A sample of 98 Scandinavian target firms has been analyzed in the time span between 1997 and 2011 in order to find empirical evidence that supports the hypothesis that the announcement of cross-border M&A generates value for target firm shareholders.

The announcement effect of cross-border M&A activity is in this thesis evaluated on the basis of the shareholders' value approach. This approach compares shareholders' value, measured by stock returns, subsequent to the announcement of cross-border M&A to an estimated value that is calculated based on the assumption that the M&A had not occurred. Since the purpose of this thesis is to look at the effect of M&A announcement on shareholders' value, the impact of M&A on other stakeholders[1] is not examined.

The event study methodology has been applied in order to detect abnormal returns during an event period of five days, where the abnormal return is the difference between the observed return of a security and the return of a security that are expected to be observed if no event occurs (Peterson, 1989). The event period over which the abnormal returns are examined spans from two days prior to the announcement of cross-border M&A to two days after the announcement of cross-border M&A.

This study finds significant and positive average abnormal returns on both of the days prior to the announcement day. These results indicate that news about mergers and/or acquisitions on some occasions reached the market before the actual day of the announcement, possibly due to information leakage or rumors. In addition, a significant and positive abnormal return is found on the first day following the announcement day, indicating that news about mergers

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[1] Other stakeholders include employees, customers, management and the society

and/or acquisitions in some cases reached the market after trading hours which made it impossible for market participants to react to the news on the actual day of the announcement.

The cumulative average abnormal returns of the securities in the sample represent an estimate at the time of the M&A announcement of the expected discounted value to shareholders generated by the take-over (Campa & Hernando, 2004). The empirical evidence of this study suggests that target shareholders in Scandinavia experience a statistically significant cumulative average abnormal return of 14.7% during the five days under which the returns of the stocks are examined. The main conclusion of this thesis is that the announcement of cross-border M&A generates value to target firm shareholders in Scandinavia in the short-run.

Preface

I would first and foremost like to thank my academic advisor, Karen Helene Ulltveit-Moe, for her help and guidance through the process of writing this master thesis.

BI-Norwegian Business School deserves my deepest gratitude for making this thesis possible by granting me access to financial databases which contains the data used in this study.

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1 Introduction

Over the past 30 years, the complex phenomenon of mergers and acquisitions has attracted substantial interest from a broad range of management disciplines. Even though studies provide evidence of mixed performance to the broad range of stakeholders involved in mergers and acquisitions, the phenomenon continues to be a highly popular form of corporate development (Cartwright & Schoenberg, 2006). Merger and acquisition (M&A) can in short be defined as the combining of two or more firms, or transactions that result in the transfer of ownership as well as management and control rights from one company to another. The company that is being acquired is called ''the target'', while the other is called ''the acquirer'' or ''the bidder''. Throughout this study the terms 'merger' and 'acquisition' will be used interchangeably referring to all transactions in which the businesses of companies are combined through the purchase of the majority of shares or assets, or through a merger (Wübben, 2007, p.6). This is common for many studies on the subject due to the fact that the net result of a merger and an acquisition is often the same (Ma, Pagán & Chu, 2009). Using the definition of M&A, cross-border M&A can be explained as M&A where the head office of the target is located in another country than the ultimate parent of the acquirer or merging company (Buch & DeLong, 2004). While the majority of M&As involve firms within the same country, the share of M&As that involve firms headquartered in two different countries is constantly increasing (Shimizu, Hitt, Vaidyanath & Pisano, 2004).

Cross-border mergers and acquisitions are part of the fundamental mechanisms of industrial globalization. Even though the driving forces behind cross-border M&A vary by sector, there are some factors that have been seen to evidently encourage cross-border M&A. Prolonged economic growth increases the capital available for industrial purchases abroad and attracts inward investments at home. Technological changes, like the new information technologies, make cross-border business expansion easier and more practical. Government policies, such as investment liberalization, privatization and regulatory reforms, make it easier to access targets for acquisition and tend to increase the number of M&As. Cross-border M&A can be beneficial to both host and home countries if the acquisition leads to increased company performance and profits without undue market concentration. Such benefits include revitalizing bad performing firms and local economies, create jobs, and drive technology and

productivity growth (Kang & Johansson, 2000). M&A can thus influence the common good in various ways, including industry concentration and monopoly, international competiveness, productivity growth, and technology transfer (Bruner, 2002).

Empirical findings suggest that foreign-owned firms on average pay higher wages than privately-owned local firms. This has shown to be the case in both developing countries and developed high-wage countries. Reasons for this might be that workers must be compensated to overcome the preference of working for domestically-owned firms, or because the acquiring firms pay higher wages to attract better workers due to the firms' limited understanding of the local labor markets. Domestically-owned firms are on the other hand more knowledgeable, and can identify and attract better workers without paying them higher wages. A higher degree of foreign ownership may additionally affect the average level of wages in a country or industry because of positive wage spillovers to domestically-owned firms. The positive effect on wages in the host country may also reflect the impact of foreign firms on the aggregated demand of labor (Lipsey, 2002).

If foreign-owned firms are more efficient than domestically owned firms, their superior productivity may spill over to locally-owned firms in the industry or related industries. The positive productivity spillovers may emerge from domestically-owned firms copying the operations of the foreign-owned firms, or because domestically-owned firms are forced to raise their efficiency due to competition from foreign-owned firms (Lipsey, 2002).

In addition to the positive spillover effects on wage and production in the host country, foreign-owned firms' activities may also raise the export propensities of domestically-owned firms. Studies find that greater export activity by foreign-owned firms increases the likelihood that domestic firms will export (Lipsey, 2002).

Technology spillovers from cross-border M&A may provide externalities that should have a positive effect on the economic growth in the host country. Inflows of physical and human capital generated by cross-border M&A increases the productive capacity of the host country, and contribute to the positive effect on the economic growth (Johnson, 2006).

While home country consumers might gain from cross-border M&A because of imports of cheaper goods produced by foreign-owned firms, host country consumers might gain from

more efficient production of goods and services sold locally and from the weakening of local producer monopoly positions (Lipsey, 2002).

Even though increased cross-border M&A activity may be desirable to the host country due to its positive effect on productivity and economic growth, there are some host country losers from the participation of foreign firms. In some cases, small or inefficient firms are forced to contract or leave the industry because of enhanced competition. Cross-border M&A may result in an increase of physical capital in the host country, which increases the production capacity. Some of the production which now takes place in the host country may replace production which formerly took place in the home country so that the investing firm reduces its production in the home country. This may result in shutting down or selling a plant in the home country. This may in turn result in a decline in the home country exports (Lipsey, 2002).

Studies suggest that many of the positive effects, such as increased productivity and economic growth, which result from cross-border M&A also result from domestic M&A. However, the risk of increased market concentration is higher in domestic M&A than in cross-border M&A. Domestic M&A may on the other hand make firms more effective in competing with foreign rivals (Caves, 1987).

Worldwide cross-border M&A activity increased tremendously, both in scale and value, during the 1990s. In 1998 alone, the value of cross-border M&A increased by 86%. Even though the pace of growth slowed down the following year, the value of cross-border M&As is still increasing (Organisation for Economic Co-operation and Development, 2001). According to data collected from Thomson Reuters Datastream (2012), worldwide cross-border M&A activity continued to increase during the last decade, and there are no signs indicating that this trend will stop in the nearest future.

1.1 Problem statement

Along with the increase in cross-border M&A, studies on the topic have also increased. However, the majority of research on M&A is related to domestic M&A. The body of existing research is in addition mostly concentrated on the UK and US markets (Goergen &

Renneboog, 2004). The increasing globalization of business has heightened the opportunities for engaging in cross-border M&A, and calls for a better understanding of the opportunities and challenges of firms engaging in cross-border M&A (Shimizu et al., 2004). Even though studies on cross-border M&A have increased, there have only been a few studies for the Scandinavian market. In addition to the lack of research on cross-border M&A for the Scandinavian market, the many obstacles associated with this form of take-overs make it interesting to investigate the phenomenon in Scandinavia.

Primary stakeholders can be defined as stakeholders who bear some form of risk as a result of having invested something of value in a firm. While primary stakeholders include capital suppliers, employees, other resource suppliers, customers, community residents and the natural environment, this thesis will only focus on the value created for the capital suppliers which will be addressed as shareholders in the remainder of this thesis (Hillman & Keim, 2001). The effect of M&A on one type of stakeholders may be very different from the effect on other types of stakeholders. Industry output will in many cases contract following an M&A, and will therefore decrease consumer's surplus, which is the difference between the value a consumer places on a unit of consumption and how much he actually has to pay for it (Varian, 2006, p. 250). The effect of M&A on consumers can thus be negative due to increased prices as a result of a decrease in industry output. Industry profits will on the other hand rise because of increased efficiency from cost rationalization[2], and M&A may thus effectively transfers wealth from consumers to firms (Polasky & Mason, 1998).

A common objective of all firms is to enhance shareholders' welfare, which is usually synonymous with creating value for the shareholders. M&A can be seen as a way to try to maximize shareholders value through creation of special capabilities or achievement of competitive scale (Bruner, 2002). This thesis studies the announcement effect of cross-border M&A on Scandinavian target shareholders' value. In order to measure the success of an M&A, this thesis will compare shareholders' value, by examining stock returns, in the period surrounding the announcement of the merger or acquisition to an estimated value which is calculated based on the assumption that the merger or acquisition has not occurred. This approach links the business goals of the firm solely to the financial goals of the shareholders, which is to maximize the stock price (Wübben, 2007, p.13), but has the advantage that the effect of M&A is easy to observe (Campa & Hernando, 2004).

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[2] See section 2.3.1

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Given all possible economic effects of cross-border M&A[3], an ideal analysis should include effects of cross-border M&A on other components of the Scandinavian economies in addition to the effect on private finances. However, due to the scope of this study and limited access to available data, the effect of cross-border M&A activity in this thesis is evaluated solely on the basis of the shareholders' value approach.

When measuring the announcement effect of M&A in the short run, there will generally be no information other than the news of the merger or acquisition, and the observed returns during the event period are therefore entirely due to this news as opposed to measuring the effect in the long-run where there is always a risk of cofounding events during the period when stock returns are examined (Shleifer & Vishny, 2003). Evidence on long-term effects of M&A demonstrates that M&A lead to a decline in share prices over several years subsequent to the take-over. This may be due to the fact that market participants often overestimate the potential gains from a take-over when the bid is announced, and revise their expectations downwards when more information on the transaction is released. This explanation for the evidence on negative long-term effects of M&A implies that take-over activity destroys shareholders' value on average and fails to fulfil the expectations (Martynova & Renneboog, 2008).

Campa and Hernando (2004) look at the value generated to shareholders by the announcement of M&A involving firms in the European Union over the period 1998-2000, and find that target firm shareholders' wealth increases in the period surrounding the announcement date. However, when M&A includes two firms from different countries, M&A generates lower value, especially in industries that have been under government control or that are still heavily regulated (Campa & Hernando, 2004).

According to data collected from Datastream, the total number of cross-border M&A in Scandinavia increased from 85 to 221 between 1997 and 2011[4]. The increase in cross-border M&A in Scandinavia is a motivational factor for exploring whether M&A announcements create value for the shareholder of Scandinavian target firms in the short run. Previous studies suggest that target shareholders value increases in the period surrounding the day when the acquisition is announced (Bruner, 2002). However, according to our knowledge, there is no evidence that the same is true for the Scandinavian market. This thesis will therefore investigate the short-term effect of cross-border M&A on target shareholders' value in

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[3] See Introduction

[4] See appendix A for total number of cross-border M&As in Scandinavia in the time span during 1997 and 2011

Scandinavia by using financial data from 98 Scandinavian target firms in the period from 1997 to 2011, and will thus measure success of cross-border M&A based on quantitative information as opposed to qualitative information, which is usually obtained from interviews or questionnaires of people involved or affected by an acquisition or a merger (Wübben, 2007, p.11).

The event study methodology will be applied in order to examine abnormal returns surrounding the announcement date of M&A, where an abnormal return is the difference between the observed return of a security and the return of a security that is expected to be observed if no event occurs (Peterson, 1989). A significant positive or negative cumulative abnormal return during a period of five days surrounding the announcement of cross-border M&A means that the announcement of cross-border M&A has either a positive or a negative effect on target shareholders' value in Scandinavia. In order to estimate the market model parameters used to calculate the abnormal returns, SPSS is used as statistical software in this thesis, while Excel is used to calculate abnormal returns. Due to the choice of methodology applied in this thesis, the effect of M&A on various measures of operating performance like income, firms' sales or profits will not be examined. This thesis will focus on the effect of cross-border M&A in the short-term assuming stock market efficiency instead of the long-term approach which assumes that the effects of events take time before they are incorporated into the stock prices (McWilliams & Siegel, 1997). The short-term announcement effect of M&A on shareholders' value is interesting to investigate since the share prices will reflect investors' expectations about the firms' prospects. A potential examination of the long-term effect on share prices would on the other hand disclose whether the anticipated gains actually exist or are overstated (Martynova & Renneboog, 2008).

Taking previous studies from the European and US markets into consideration, the following research question will be investigated in this thesis:

Will the announcement of cross-border M&A generate value for target firm shareholders in Scandinavia in the short-run?

The announcement effect of cross-border M&A on shareholder value will reflect changes in the expected future cash-flows to shareholders due to the positive effects which may emerge from a take-over. An investigation of the announcement effect of cross-border M&A will thus be fruitful for firms that consider engaging in cross-border M&A since it represents the best estimate of the expected discounted value generated by the merger or acquisition. Value

creation for the shareholders of the target and acquiring firms generated by an M&A will however only be a partial measure of the net increase in welfare of the stakeholders (Campa & Hernando, 2004). Since the purpose of this thesis is to investigate the announcement effect of cross-border M&A on target shareholders' value, the impact on other stakeholders will not be examined.

1.2 Delimitations

First of all, since the majority of literature is related to domestic M&A, this thesis will solely concentrate on cross-border M&A. Secondly, the sample of firms being investigated is narrowed down to only include Scandinavian firms. Thirdly, this research has been limited to target firms. The announcement effect of cross-border M&A on Scandinavian acquiring firms will therefore not be analyzed. Lastly, as mentioned in the previous section, this thesis will only focus on the short-term effect of the announcement of cross-border M&A on shareholders' value, and will therefore leave out the long-term approach. The choice of time interval under which the announcement effect is measured will be justified in chapter 5.

This thesis will be organized in the following way: Chapter 1 offers definitions, the problem statement and delimitations. Chapter 2 provides a thorough description of the observable trends in the history of M&A, an explanation of different types of M&A, a description of different theories on why firms choose to engage in M&A, main obstacles of M&A and an overview of cross-border M&A in Scandinavia. Chapter 3 delivers a literature review of previous research on the effect of M&A on shareholders' value, and in chapter 4, the data selection and final sample will be explained. Chapter 5 describes the event study methodology and test statistics applied in this thesis. Chapter 6 provides the reader with the empirical results. Chapter 7 and 8 gives suggestions for further research and the conclusion.

2 Theoretical and empirical background

2.1 Types of M&A

In the theory of mergers and acquisitions, there are different types of M&As to consider. Whether an M&A is related or unrelated is perhaps the most important distinction between the different types of M&A. Horizontal and vertical M&As can be classified as related M&As. In the matter of horizontal M&As, the acquirer and the target firm operates in the same industry and on the same industry level. In this way, multinational enterprises can strengthen their competiveness in their core businesses. In vertical M&As, firms operate in different stages in the same industry. Vertical M&A is typically an M&A which includes firms with a buyer-seller relationship. Conglomerate M&As are transactions which occur between firms that operates in different business sectors without a specific connection. These types of transactions are often characterized as unrelated M&As (Organisation for Economic Co-operation and Development, 2001).

An M&A can be characterized as friendly or hostile, depending on the attitude of the target company's management or board of directors. The takeover is considered to be friendly if the target company's board of directors recommends accepting the offer from the acquiring firm, while the take-over is considered hostile if the board rejects the offer. In the case of a hostile take-over, the acquiring firm does not have the opportunity to access the target firm's detailed financial data. This is a disadvantage for the acquiring firm since the only information it can obtain about the target company will be the information which is publicly available. The situation is different in a friendly take-over, where the target company usually gives the acquiring firm most or all of the detailed finance data. The majority of cross-border M&As are friendly. Almost 95% of cross-border M&As were friendly between 1990 and 1999 (Organisation for Economic Co-operation and Development, 2001). Information on sub deal types of 3425 cross-border M&As in Scandinavia in the period from 1997 to 2011 reveals that only 7 of the 3425 take-overs of Scandinavian firms in the period were hostile (Thomson Reuters Database, 2012). Tender offers are characterized as offers made directly to target shareholders in order to overcome resistance from incumbent managers. Tender offers are often an indication of greater confidence in the acquirer's ability to realize synergies from the acquisition (Loughran & Vijh, 1997).

Cross-border M&As are either inwards or outwards. This thesis will focus on inward cross-border M&As in Scandinavia, which incur inward capital movement through the sale of all or parts of Scandinavian firms to foreign investors. Outward cross-border M&As then incur outward capital movement through the purchase of all or parts of foreign firms. When a firm acquire more than 50% of the shares of the acquired firm, the M&A is called majority M&A. A minority M&A, on the other hand, is an M&A mode where a firm engage in an acquisition of a minority share-holding. Cross-border majority M&A is preferred to cross-border minority M&A as an entry mode into markets in developed countries, while cross-border minority M&A is preferred to cross-border majority M&A in developing countries. A possible explanation for the different entry modes across countries could be that it is easier to find appropriate firms to acquire in developed countries than in developing countries. In addition to the relative scarcity of appropriate target firms, more restrictions on take-overs may exist, particularly on majority take-overs, in developing countries (Kang & Johansson, 2000).

2.2 Merger and acquisition waves

The previous century experienced five waves of major merging activity: the 1890s, the 1920s, the 1960s, the 1980s and the 1990s, where the final wave is remarkable due to its breadth and geographic distribution. Europe had 117 000 M&A deals during the fifth wave, compared to only 13 000 during the fourth wave. The activity level abroad increased tremendously during the fifth wave, and a substantial takeover market emerged in Asia. The increase in cross-border acquisitions in sectors such as finance and telecom was among other factors generated by the enhancement in privatization and deregulation (Gregoriou & Renneboog, 2007).

Takeover waves are often driven by industrial and technological shocks, and is often fuelled by regulatory changes as seen during the fifth wave. While takeover activity is usually disrupted by a steep decline in the stock market, patterns show that takeovers increase in periods of economic recovery as was the case of the first wave in America during the 1890s. During this period, many giant companies were created as a result of the increased M&A activity, and public concern was raised due to the monopolization efforts that marked restructuring activity. As a consequence, the Antitrust Law was inducted in both Europe and the US (Gregoriou & Renneboog, 2007). The objective of the anti-trust policy was to break up dominant firms. As a reaction, firms expanded through vertical integration, where the

companies in a supply chain are united through a common owner, instead. Industries were now no longer dominated by one giant firm, but by two or more corporations. The effort of the corporations to achieve economies of scale was the characteristics of the second wave, and marked the difference from the first wave where the main objective of firms was to gain market power. The second wave collapsed in 1929 with the stock market crash and The Great Depression (Martynova & Renneboog, 2005).

The third M&A wave started in the 1950s and lasted for almost two decades (Martynova & Renneboog, 2005). In a similar manner as the second wave, the third wave also collapsed due to an economic recession. The new takeover wave peaked in 1968, but collapsed during the oil crisis in 1973. The third wave was different in the UK and the US. While the former wave emphasized vertical integration, the third wave focused on diversification and development of large conglomerates since the anti-trust legislation left the acquiring firms in the US with the only option of buying companies outside their own industries. However, countries without a strict antitrust policy, such as France, Germany and Australia, did also pursue conglomerate strategies in hopes of enhancing company value and reducing earnings volatility (Andrade, Mitchell & Stafford, 2001).

The stock market recovered from the preceding economic recession around the same time as the antitrust policy changed and the financial service sector was deregulated. In addition to technological progress in the electronics industry, these are factors which characterized the start of the fourth wave in 1981. The third wave's inefficient unrelated diversifications made companies refocus on their core business. A shift in power of corporate stakeholders to shareholders during the period of the fourth wave was mainly a result of the enhancement of hostile takeovers (Martynova & Renneboog, 2005).

Only four years after the fourth wave ended, the fifth takeover wave started in 1993. In similarity to the previous waves, the fifth wave ended as a consequence of the equity market collapse in 2000. A different feature of the fifth wave compared to previous waves was that a substantial part of the M&As were cross-border transactions. The proportion of diversification in M&A deals continued to decrease towards the end of the 20th century (Martynova & Renneboog, 2005), along with the proportion of hostile takeovers which also decreased by a substantial amount from the fourth to the fifth takeover wave (Andrade et al., 2001).

At the beginning of the 21st century, a new M&A wave emerged. The latest merger wave started in 2003, about three years after the technology bubble burst (Alexandridis, Mavis &

Travlos, 2012). Literature on the sixth merger wave is still limited, but a remarkable feature of the recent merger wave is that market returns were significantly lower than market returns prior to deals in the fifth merger wave. A reason for this could be that there was less investor over-optimism during the last two merger waves. The last identifiable wave came to an end in late-2007 when investors and corporate managers started to show real signs of scepticism about the state of credit markets and its potential destroying effect on the financial system and the economy as a whole (Alexandridis et al., 2012).

An interesting feature of the merger waves is that they are not similar even though they occur in readily identifiable waves over time. The level of merger activity in each industry has been seen to vary over time. Thus, industries where the level of merger activity is high in one decade are no more likely to exhibit a high level of merger activity in the next decade. This may indicate that a significant portion of merger activity may be due to industry-level shocks like technological innovations, supply shocks and deregulation (Andrade et al., 2001).

2.3 Motives, risks and obstacles of M&A

The traditional finance paradigm assumes that the behaviour of economic agents is fully rational. A consequence of this assumption is that M&A activity is purely motivated by economic reasons, and should therefore lead to measurable improvements in the post-M&A performance. However, empirical evidence shows that many M&As destroy shareholder value in the post-M&A period. Behavioral explanations of M&A replace the view that stakeholders in the M&A process act rationally in a frictionless environment with more relaxed behavioral assumptions (Baker & Kiymaz, 2011, p.385).

2.3.1 Neoclassical theories

The most common reason for firms to initiate M&A is the synergy argument claiming that the value of the post-merger firm is greater than the sum of the individual companies' value before the merge. It is common to divide the main types of synergy into two categories: operating synergy and financial synergy (Gaughan, 2011, p.133).

Operating synergies can be achieved through revenue enhancements and cost reductions. Revenue-enhancing operating synergy may come from new opportunities that are made possible as a result of the combination of two merged companies. It may also be achieved if one company with a major brand name lends its reputation to an upcoming product line of the partner company it has merged with. Revenue-enhancing synergies are often more difficult to achieve than cost-related synergies since they are more difficult to quantify and build into valuation models (Gaughan, 2011, p.134).

Cost-reducing synergies may come from economies of scale, which can be explained as reductions in per-unit costs due to an increase in the size or scale of a company's production. The fixed costs of capital intensive firms are often spread out over relatively low levels of output. If these firms get the opportunity to increase output, the per-unit costs will decline. Cost-reducing synergies may also come from specialization of labour and management, and more efficient use of capital equipment, but this might not be possible at low output levels (Gaughan, 2011, p.135). The benefits of M&A includes the possibility of eliminating some fixed costs, reducing R&D and management expenditures, and cost reduction by rationalization of selling, marketing and advertisement department (Gurusamy, 2009). However, the merged firm may also experience diseconomies of scale, which is the case when per-unit costs increase, and might occur if the firm experiences problems associated with coordinating a larger-scale operation (Gaughan, 2011, p.135).

Financial synergy refers to the possibility that the cost of capital may decrease when one or more companies are combined. Merging firms may reduce risk if the firms' cash flow is not perfectly correlated such that the volatility of the cash flows decreases. Wide swings up and down in the combined firms' cash flows will be less likely. The probability of bankruptcy will presumably be lower if the suppliers of capital consider the firm less risky. If one of the two merging firms had experienced conditions that would force it into bankruptcy in advance of the merge, creditors would presumably have suffered a loss. However, when the two firms are combined, the solvent firm would cushion the decline in the other firm's cash flows. The offsetting earnings of the solvent firm might be sufficient to prevent the combined firm from falling into bankruptcy, and thereby keep the creditors from suffering losses. This effect is often referred to as debt coinsurance. However, there are disagreements on whether the effect of debt coinsurance is more relevant for conglomerate acquisitions than for non-conglomerate acquisitions (Gaughan, 2011, p.143).

2.3.2 Behavorial theories

Roll (1986) presents the Hubris hypothesis as an explanation on why acquisitions occur. According to the Hubris hypothesis, managers make mistakes when evaluating target firms, and the valuation above the current market price represents a positive valuation error. When the target firm shareholder conducts a valuation, it has a lower bound, the market price. No offer is made if the valuation is under the market price, because the bidder knows that the shareholder will not sell below this price. If the bidder believes that there are potential synergies or other sources of takeover gains, in a situation where there are no gains, the valuation of the target can be considered as a random variable whose mean is the target firm's current market price. If the random variable does not exceed its mean, no offer is made. However, if the random variable does exceed its mean, an offer is made. Outcomes in the left tail of the distribution of valuations are never observed since offers only are observed when the valuation is too high. In this case, the takeover premium (tended offer or merger price less preannouncement market price of the target firm) is simply a random error, and thus a mistake made by the bidding firm. The observed error is always in the same direction because corresponding errors made in the opposite direction is not made public and will therefore not enter the empirical samples. Since market prices seem to reflect rational behaviour, firms should realize that any bid above the market price represents an error. However, it is important to keep in mind that market prices are averages, and that there is no evidence that indicates that every individual act is if they are rational economic human beings whose behaviour seems revealed by behaviour or market prices (Roll, 1986).

According to the Hubris hypothesis, takeovers thus reflect individual decisions. Bidders/managers may convince themselves that their valuation is right and that the market does not reflect the full economic value of the combined firm. Even if gains do exist for some M&As, a part of the takeover premium could still be caused by valuation error (Roll, 1986). The hubris hypothesis is consistent with strong-form market efficiency, which implies that prices at any given time incorporate all information, whether public or private (Frankfurter & McGoun, 2002), and financial markets are thereby assumed to be efficient in that asset prices reflect all information about individual firms (Roll, 1986).

Jensen (1986) proposes free cash flow as another theory that opts to explain takeovers, and shows how takeovers can be evidence of the conflicts of interest between managers and shareholders. Acquiring another firm is a way for managers to spend cash instead of paying it out to shareholders. Payment of cash to shareholders reduces the power of managers by reducing resources controlled by managers. In addition, managers have incentives to expand their firms beyond the size that maximizes shareholders wealth, both because this will increase managers' control and because changes in management compensation are positively correlated with growth. In accordance with the theory, managers of firms with unused borrowing power and large free cash flows (cash flow in excess of that required to fund all of a firm's projects that have positive net present values when discounted at the relevant cost of capital) are more likely to undertake low-benefit or value-destroying mergers. In order to create shareholders' value, free cash flows should rather be paid out as dividends to shareholders instead of undertaking low-benefit mergers (Jensen, 1986).

In addition to bonuses and managerial salaries, stock options and promotions tend to be more closely related to the size or changes in size of the firm than its profits. The prestige and power managers derive from their occupation are also related to the size and growth of the company, and have a direct impact on the managers' pursuit of growth. Based on this reasoning, the growth maximization hypothesis claims that managers maximize the size of their corporation rather than its profits or stockholder welfare. Thus, managers tend to accept a lower return from investing in the stock from another firm than the shareholders (Mueller, 1969).

While most empirical studies suggest that the announcement effect of M&A is positive for target shareholders, the effect on acquiring firms is not as clear (Goergen & Renneboog, 2004). Moeller, Schlingemann and Stultz (2005) finds that announcement of M&A generate positive wealth effects for acquiring firms in the time span between 1991 and 1997, but that the losses of the acquiring firms the following four years were greater than all the gains made earlier. The wealth losses associated with the M&A announcement may be caused by overpayment by the management or because the transaction reveals that the management's strategy is unsustainable (Moeller, Schlingemann & Stultz, 2005). Overvaluation of targets is often observed in acquisitions of privately held firms because of information asymmetry. If the target is a privately held firm, its assets and operations will be more difficult to value than if the target is public (Officer, Poulsen & Stegemoller, 2009). The negative announcement effect of M&A on acquiring shareholders' wealth may also be explained by Jensen's (1986)

free cash flow hypothesis described above. Managers realize large personal gains from empire building, and firms with abundant cash flows may therefore spend cash on acquiring firms instead of paying it out to shareholders. When there are few profitable investment opportunities, the managers are more likely to make value-destroying acquisitions than to return the excess cash flows to shareholders (Masulis, Wang & Xie, 2007).

2.3.3 Main obstacles of cross-border M&A

Due to the large integration costs associated with cross-border M&A, national cultural distances often hinders cross-border acquisition performance. National cultural distances represent the differences in cultural norms between the target and the acquirer (Morosini, Shane & Singh, 1998). The challenges of cross-border M&A tend to be greater than those of domestic M&A due to the risks associated with different national cultures and institutional settings. Thorough examination of the target company and its host country is therefore necessary in order to acquire the right company (Shimizu et al., 2004).

The examination of a target firm undertaken by the acquirer prior to the takeover and the process of understanding the true value and risk associated with the deal is called the due diligence process. This process may be more challenging in the case of a cross-border M&A than in domestic M&A because the information available to the acquirer is less extensive in cross-border deals. The due diligence process may be vital in order for the acquirer to choose the right target, and it is therefore important to learn as much as possible about the new environment where the firm plans to implement the acquisition. This means that the acquirer should analyse the political, economic, legal, tax and accounting systems in the target country before engaging in an acquisition (Shimizu et al., 2004).

In addition to the challenges due to different political and legal systems, cross-border mergers and acquirers are also likely to face challenges due to differences in social and cultural norms, language barriers and history (Shimizu et al., 2004). A financial advisor is often engaged in the due diligence process in order to help identifying and/or structuring better M&As. Advisors thus identify potential targets, evaluate stand-alone and combined values, and propose methods for obtaining synergies (Kale, Kini & Ryan Jr. , 2003).

As well as cultural differences, organizational differences are also likely to be an obstacle for firms to achieve integration benefits. Since the organizational culture is highly influenced by the national culture, the risk of failure associated with cross-border M&A increases with growing cultural differences between the target and the acquirer (Harzing & Van Ruysseveldt, 2004). According to Martynova and Renneboog (2008), differences in the quality of corporate governance standards between the bidder and the target countries may explain part of the expected value creation in cross-border M&As. Corporate governance can be explained as the system of laws, rules and factors that control operations at a firm (Gillan, 2006).

In the case of a full takeover, the nationality of the target firm will change such that the acquirer's corporate governance regulation will apply to the combined company. If a bidder is subject to better corporate governance regulation than the target, the take-over may result in an improvement in corporate governance at the target, and this is expected to generate additional value which will be reflected in the abnormal share price returns of both the bidder and the target. This hypothesis is known as *the positive spillover by law hypothesis.* The opposite is true if a bidder is subject to poorer corporate governance regulation than the target. The logic behind *the negative spillover by law hypothesis* is that if the bidder governance standards are below those of the target, the abnormal share price returns will be lower. There is however a possibility that the bidder will abide by the stricter regulation that the target is subject to, and they will thus voluntarily bootstrap their corporate governance regulation to a higher level. In this case, the bidder's value may increase, and this will be reflected in the bidder share price at the announcement of the take-over. The logic behind *the bootstrapping hypothesis* is thus that bidders voluntarily bootstrap their corporate governance regulation to a higher level. The valuation effect of bootstrapping may be weaker in full take-overs where a majority stake of 100% is acquired and the target still remains listed on its national stock exchange, but it may appear in both full and partial take-overs. *The positive spillover by law effect* is to take place in take-overs which leads to a change in the target firm's nationality, but a similar spillover effect may also be seen in partial take-overs. When the bidder's standards are stricter than the target's in a partial take-over, the bidder may still impose its own corporate governance standards on the target even though the target firm is not fully absorbed by the bidder. The spillover effect in partial takeovers is called *the spillover by control hypothesis* (Martynova & Renneboog, 2008).

When engaging in M&A, the bidder is faced with different choices which can affect the combined firm's performance. One of these choices concerns the method of payment. The

bidder can choose between using cash, stock or a mix as a method of payment. Cash offers generally require debt financing considering that most bidders have limited cash and liquid assets. The bidder must in this case make a choice of debt or equity financing. Debt financing often raises financial distress costs of issuing debt, while equity financing may involve corporate control concerns of issuing equity. The choice of method of payment can thus be strongly influenced by its debt capacity and existing leverage. The bidder will have incentives to select cash financing over stock financing if preserving control is important to the management. The target can gain tax benefits when stock is used as method of payment, while cash may be preferred to stock in order to sidestep the risk of becoming a minority shareholder in a bidder firm with concentrated ownership (Faccio & Masulis, 2005). When stocks are used as method of payment, the acquirer shares the risk of overvaluation with the target's owner. When the target is difficult to value, empirical studies suggest that announcement returns to stock-swap acquirers are substantially higher than when cash is used as method of payment (Officer, Poulsen & Stegemoller, 2009).

Cross-border M&A is not only associated with greater outlets in foreign markets, but also with fiercer rivalry from foreign competitors in their domestic markets. Even though the phenomenon of cross-border M&A gives new opportunities for countries' domestic markets, it also imposes a threat on the domestic firms due to increased competition engendered by freer trade. Trade liberalization and cross-border M&A will thus force firms to adjust to a more competitive environment and the exit of foreign existing firms will increase (Bertrand & Zitouna, 2006).

2.4 Cross-border M&A in Scandinavia

There are several reasons that make cross-border M&A in Scandinavia interesting to investigate. Due to the increase in cross-border M&A in Scandinavia and the lack of research on the subject, a better understanding of the phenomenon is needed. Since cross-border M&As are subject to greater obstacles than domestic M&As, this thesis focus on take-overs where the acquirer is from a foreign country in order to investigate whether it is expected that the possible synergies that emerge from a cross-border M&A outweighs the obstacles.

According to data collected from Thomson Reuters Datastream (2012), the majority of firms that acquire Scandinavian enterprises are located in Western Europe and the United States. Among the acquiring firms in Western Europe, it is evident that other Scandinavian firms are accountable for the highest share of cross-border take-overs in Sweden, Denmark and Norway. Swedish firms were for instance accountable for about 25% of all cross-border M&A in Norway and Denmark from 1997 to 2011[5]. US and Norwegian firms are almost equally large contributors to cross-border take-overs in Sweden, while US firms are the second largest contributor in both Denmark and Norway (Thomson Reuters Datastream, 2012).

By examining the history of cross-border M&A in Scandinavia the previous 15 years, it is evident that the phenomenon occurs more often in Sweden than in its two neighbouring countries. There were roughly twice as many cases of cross-border M&A in Sweden than in Norway in the time span between 1997 and 2011. While 887 Norwegian firms were subject to take-overs by foreign enterprises, there were 1596 cases of take-overs in Sweden (Thomson Reuters Datastream, 2012). However, since the Swedish population is almost twice as large as the Norwegian population (Statistisk Sentralbyrå, 2012 & Statistiska Centralbyrån, 2012), it will make more sense to consider numbers of M&A relative to the population in each of the countries when examining the occurrence of cross-border M&A in Scandinavia. By this measure, completed cross-border M&A deals seemed to occur almost equally as often in the three neighbouring countries during the period. In comparison to cross-border M&A in Sweden and Norway, 942 Danish firms were subject to take-overs by foreign enterprises during the same time span (Thomson Reuters Datastream, 2012).

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[5] See appendix B for an overview of acquiring firms by nationality
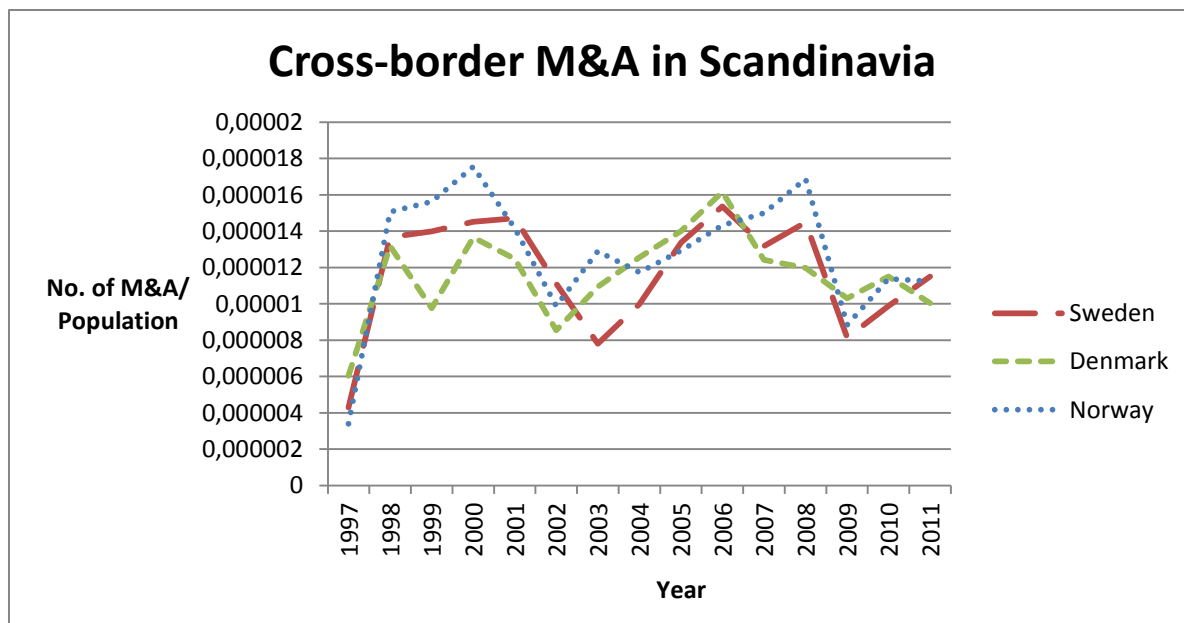
Figure 1: Cross-border M&A in Scandinavia in the time span during 1997 and 2011

Source: own illustration using data collected from Thomson Reuters Datastream (2012), Statistiska Centralbyrån (2012), Statistisk Sentralbyrå (2012) and Danmarks Statistik (2012)

The time span under which international take-overs are examined in this thesis shows that there have been peaks and lows in cross-border M&A in Scandinavia which has been driven by underlying economic factors. The stock market crash in 2000 which ended the fifth take-over wave (Martynova & Renneboog, 2005), did also affect cross-border M&A in Scandinavia, and was the reason behind the sharp decrease in number of take-overs during 2000-2002, which is seen in the graph above. A strong global growth, which contributed to a commodity price boom, was later witnessed in the timespan between 2003 and early 2008 (The World Bank, 2009). In similarity to earlier take-over waves, cross-border M&A in Scandinavia increased during this period of economic recovery. Ivashina and Scharfstein (2009) reports that new lending for restructuring, such as M&A and share purchases, fell by 60% in USA during the peak period of the financial crisis in the fourth quarter of 2008 relative to the prior quarter. The witnessed decrease in lending for restructuring during the financial crisis could be a result of the decreased demand for loan, the concentration in loan supply, or both (Ivashina & Scharfsein, 2009).

In similarity to bank loans, intra-company loans did also dwindle in the time of the crisis (Poulsen & Hufbauer, 2011). Firms affected by the global liquidity crisis were thus

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experiencing limited access to financial resources which constrained the purchasing abilities of acquiring firms and resulted in a sharp decrease in M&A activity (Calderon & Didier, 2009). The capacity of firms to invest therefore weakened considerably during the financial crisis which started in the end of 2008. In addition, the crisis probably fostered a more cautious attitude among managers which may have resulted in a move away from high-risk projects to safer assets. Given that the crisis started in Western countries and that economic growth is one of the main drivers behind foreign direct investment and M&A, it is not difficult to see why cross-border deals of developed-country companies have declined the most. The dive in cross-border M&A deals of companies in Western countries has led to a major drop in cross-border M&A worldwide, and 2009 was the year when the foreign direct investment recession reflected in M&As became truly global in character (Poulsen & Hufbauer, 2011).

3 Literature review

Cross-border mergers and acquisitions have increased tremendously over the last decade, but research on the area has failed to keep in pace with this trend. Even though the literature on the subject is extensive, there are still many gaps that need to be addressed (Shimizu et al., 2004). The majority of literature on M&A is related to domestic M&A. A reason for this is probably that M&As involving firms from the same country has been the most common form for mergers and acquisition. However, as globalization of business has increased, the opportunities for engaging in cross-border M&A have heightened. A better understanding of the opportunities and challenges of firms engaging in cross-border M&A is thus needed because of their growing importance in the global market (Shimizu et al., 2004). In addition to the fact that most studies concentrate on M&A in one single country, it is also evident that most studies concentrate on the US and UK markets (Goergen & Renneboog, 2004).

Mulherin and Boon (2000) are the authors of one of many research papers on abnormal announcement returns in USA. Their findings are similar to other researchers on the area, and show that shareholders of target firms receive large premiums relative to the preannouncement share price. The effect of M&A announcements on the wealth of the bidding firms are on the other hand not as clear (Goergen & Renneboog, 2004). Walker (2000) mentions empirical studies that indicate that M&A announcements have little impact on the stock prices of the acquiring firm. His own study examines the abnormal return of 278 completed acquisitions over five days between 1980 and 1996, and finds that bidder shareholders generally earn normal cumulative market-adjusted return following related acquisitions and negative cumulative market-adjusted return following unrelated acquisitions. However, about half of the existing studies on the subjects report zero or small returns for the acquirers in USA (Goergen & Renneboog, 2004).

Cheng and Chan (1995) examines 70 US targets of international takeovers from 13 countries, and find that US target firms earn positive abnormal returns after being acquired by a firm from a foreign country when investigating stock prices of the target firm over three days surrounding the announcement date. The study exhibit the same results as the study by Harris and Ravenscraft (1991), which also reports positive abnormal returns for US target firms following a cross-border acquisition after studying 159 cross-border acquisitions in USA

between 1970 and 1987. The effect of cross-border M&A and domestic M&A on target shareholders wealth in USA is thus the same according to the studies revised. In addition to prove positive abnormal returns for US target firms in the period surrounding the announcement day, Harris and Ravenscraft (1991) also find that target wealth gains are significantly higher in cross-border takeovers than in domestic takeovers. The evidence for the UK is however weaker, a result which indicates that the location of the target appears to have a significant impact on cross-border acquisitions effect. The same result is true for UK bidder abnormal returns. However, the study shows that UK targets in cross-border acquisitions yield positive abnormal return, which is consistent with the result for the US target firms in cross-border acquisitions. Exchange rate movements may give foreign bidders a cost of capital advantage, and there is therefore a possibility that exchange rates have an impact on the level of abnormal returns in cross-border acquisitions (Danbolt & Maciver, 2012). Even though most empirical evidence suggest that the announcement effect of M&A is positive for target shareholders, Loughran and Vijh (1997) finds that target shareholders who doesn't sell out soon after the acquisition effective date when stock is received as payment, but rather hold on to the acquirer's stock, find their gains diminish over time.

A difficulty with the event study methodology, which is most commonly used in order to detect abnormal returns in the events of M&A, is the disagreement on which asset pricing model is to be used. The choice of model may have an important impact on the scale of abnormal returns. However, many studies that use different types of models come to the same conclusion that takeovers are wealth reducing events for acquiring companies. When studying returns in hostile bids, however, the result showing negative returns is not significant in all models (Gregory, 1997). Gregory (1997) also finds that over-payment is more likely in agreed bids, which may be a reason of why recommended offers have the worst performance over the 24 months studied after the acquisition. Agreed bids are thus less successful than hostile bids. In addition to these results, acquisitions by multiple acquirers were proven to be less unsuccessful than those by a single acquirer.

While the majority of existing research on the announcement effect of M&A focuses on gains or losses to shareholders in the short run, a smaller body of research examines long-run post-acquisition returns (Dutta & Jog, 2009). Martynova and Renneboog (2008) finds that the magnitude of the M&A effect on the share prices strongly depends on the estimation method used when examining long-term wealth effects. Studies employing the market model tend to

reveal significantly negative abnormal returns over the three years following the announcement of M&A, while studies applying other estimation techniques, such as the Capital Asset Pricing Model (CAPM), yield inconsistent results about the cumulative average abnormal return in the long run. However, the long-term abnormal returns become significant when the M&A transactions are partitioned into subsamples like method of payment and bid status, such as hostile and friendly bids. When M&As are fully financed by equity, empirical evidence suggests that M&As yield significantly negative long-term returns. All-cash bids are, on the other hand, followed by positive returns. Evidence from the UK shows that hostile bids significantly outperform friendly ones over a three years window after the announcement of the bid (Martynova & Renneboog, 2008). Studies on the long-term gains of related and unrelated acquisitions do however differ in their conclusion on the long-term effect of M&A on shareholders' value. Martynova and Renneboog (2008) mentions two different studies on the subject by Haugen and Undell (1972), and Eckbo (1986) which differ in their concluding remarks on the long-term gains of related and unrelated acquisitions. Haugen and Undell (1972) study a sample of 168 M&As during 13 years, and find evidence that both related and unrelated acquisitions lead to significantly positive abnormal returns over a four-year period, while Eckbo (1986) finds that unrelated takeovers outperform the ones triggered by industry-related bids when studying the valuation effect of M&A in Canada.

As for UK and US target shareholders, Goergen and Renneboog (2004) show that the announcement of a takeover bid also causes substantial positive abnormal returns for the shareholder of European target firms. The study analyses the effect of the announcement of cross-border M&A over a period starting six months prior to the announcement, and includes intra-European deals from 1993-2000. On the event day itself, it is shown an abnormal return of 9% for the target shareholders. However, when studying the two months prior to the announcement including the announcement day, Goergen and Renneboog (2004) find that the cumulated abnormal returns amount up to 23%. This striking result suggests that bids were anticipated which is probably due to rumours or insider trading. Abnormal returns to bidder shareholders are also significantly positive, but small. However, the positive cumulative abnormal returns to bidder shareholders are only statistically significant when analysing the five days surrounding the announcement day, but this is not the case when longer periods are being analysed. In addition, Goergen and Renneboog (2004) have also analysed market reactions to different types of takeovers, and finds that hostile bids generate the largest abnormal return for targets on the announcement day.

Martynova and Renneboog (2008) examines European cross-border M&As during the fifth takeover wave (1993-2001), and their findings suggest that corporate governance regulation has a significant impact on the flow of cross-border take-overs. Their evidence also suggests that firms from countries with weak corporate governance regulation are more likely to engage in M&A abroad rather than domestically. In line with Goergen and Renneboog's findings, Martynova and Renneboog (2008) also find evidence that target returns are significantly higher in hostile take-overs than in friendly take-overs, and that the same is true for full take-overs compared to partial take-overs. Target returns are, on the other hand, significantly lower when corruption in the target country is high. In addition, empirical evidence from Martynova and Renneboog (2008) suggests that the *positive spillover by law hypothesis*[6] is supported. The effect of M&A announcement on abnormal share price return of the bidder and target will thus be positive when the bidder governance standards are stricter than the target's. The empirical evidence does however not support the *negative spillover by law hypothesis*. On the other hand, evidence does not contradict the *bootstrapping hypothesis* or the *spillover by control hypothesis*. These effects are however only valid for partial take-overs (Martynova & Renneboog, 2008).

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[6] See section 2.3.3 for the logic behind the hypotheses

4 Data description

This thesis uses data collected from Bureau Van Dijk's database Zephyr in order to draw a sample of Scandinavian firms that has been subject to an acquisition or a merger in the time span between 1997 and 2011. Zephyr is the most comprehensive database of deal information and is updated hourly. The database contains information on M&A, IPO (Initial Public Offering), private equity and venture capital deals and rumours. It is possible to search by hundreds of criteria, for instance deal type, sub type, target industry and location of target firm, which is a necessity in order to look at the effect of cross-border M&A on value creation to target shareholders in Scandinavia.

It was first and foremost important to select what kind of transactions this thesis is concentrating on, namely cross-border mergers and acquisitions. The next data selection was based on geography. Since the aim of the thesis has been to look at cross-border M&A in Scandinavia, the selection was restricted to only include Scandinavian target firms taken over by foreign acquirers. Further restriction was taken to only concern acquisitions of Scandinavian firms in the timespan between 01.01.1997 and 31.12.2011, thus a total of 15 years. Firms lacking information about ISIN (International Securities Identification Number) were excluded from the sample. Another characteristic of the deals included in the sample is that they had to be completed. Deals that were only announced, but not completed were excluded from the sample. The M&As which are analysed in this thesis are majority M&As, i.e. acquisitions where the acquiring firm acquire more than 50% of the shares of the target firm. Firms that were acquired or announced to be acquired multiple times during the study period were also excluded from the sample. This was done because one announcement of M&A may affect the abnormal return in the event window of another announcement, in the case that the first announcement is made during the estimation period of the second announcement. One of the acquisitions in the sample was announced during a day when the stock market was closed. As a solution to missing return of data due to non-trading, proposed by Peterson (1989), the announcement day has therefore been chosen to be the following day when the stock market was open. After excluding the firms which lacked the necessary characteristics described above, 98 Scandinavian target firms were left in the sample.

Year	Number of cross-border M&A
1997	1
1998	2
1999	10
2000	15
2001	7
2002	5
2003	5
2004	4
2005	7
2006	4
2007	8
2008	13
2009	7
2010	7
2011	3
Total	98

Table 1: Number of cross-border M&As with Scandinavian firms as targets in the sample

Source: Own illustration

In order to retrieve abnormal returns of the stocks analysed, it was necessary to get information on return indices for target firms and the Scandinavian markets. The collection of daily data has been necessary in order to study security price reactions in the period surrounding the announcement day. Information on daily return indices for each target firm and each of the Scandinavian countries was collected from Thomson Reuters Datastream. Thomson Reuters Datastream is a database containing financial information of firms and markets in addition to macroeconomic data from the Organization of Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF). Inspired by Martynova and Renneboog (2008), the MSCI index is used to collect return indices of the Scandinavian markets. In order to achieve return indices related to the target firms in the sample, it was necessary to obtain the target firms ISIN from Zephyr.

5 The econometric methodology

The effect of cross-border M&A activity in this thesis is evaluated on the basis of the shareholders' value approach which compares shareholders' value, measured by stock returns, subsequent to the announcement of cross-border M&A to an estimated value that is calculated based on the assumption that the M&A had not occurred (Wübben, 2007, p.13). While the majority of existing research on the announcement effect of M&A provide empirical evidence that announcement of domestic M&A increase target shareholders value, this thesis study the announcement effect of cross-border M&A in Scandinavia. The announcement effect of cross-border M&A in Scandinavia is examined by comparing stock returns of Scandinavian target firms in the period surrounding the announcement of cross-border M&A to a period when no event occurs in order to give support to the view that the announcement of cross-border M&A enhances target shareholders' value.

The difference between the expected return when no event occur and the observed return when a merger or an acquisition is announced is fruitful to investigate since it represents an estimate of the expected value generated by the transaction. Due to the fact that cross-border M&As are subject to greater obstacles than other transactions[7], the probability that cross-border mergers or acquisitions actually will be completed as announced decreases compared to other transactions, and the expected discounted value of cross-border M&As will be reduced (Campa & Hernando, 2004). It is therefore interesting to examine whether the announcement of cross-border M&A succeed in creating value for the target shareholders. As previously mentioned, enhanced value for shareholders is an incentive for firms to engage in cross-border M&A. Empirical evidence that support the view that cross-border M&A increases target shareholders' value can be helpful for firms in deciding whether or not to engage in cross-border M&A.

There are various methods in order to measure M&A profitability. These include event studies, accounting studies, surveys of executives and clinical studies. While event studies examine the abnormal return to shareholders in the period surrounding the announcement date of the M&A, accounting studies examine the reported financial results of targets and acquirers in order to see if there are any differences in the results after an acquisition. The objective of surveys of executives is to ask managers whether or not the acquisition has created value in

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[7] See section 2.3.3

order to measure the profitability of M&A. Clinical studies, however, focus on one transaction or a small sample in great depth (Bruner, 2002). In order to measure the value generated to target shareholders in Scandinavia by the announcement of cross-border M&A, this thesis will use event studies. The goal of an event study is to see whether a particular event influences some outcome (Wooldridge, 2009, p.355). Event studies are normally used to assess the economic impact of a given event, and often utilise financial market data in order to measure the impact of a special event on the value of the firm. The method is widely used when studying the effect of the announcement of M&A on shareholders' value. The usefulness of an event study comes from the fact that, given rationality in the market, the effects of an event will be reflected immediately in security prices (MacKinley, 1997). This approach will typically not say anything about the impact of M&A on other stakeholders like employees, customers, management and the society, which are other potential perspectives for evaluating M&A success (Wübben, 2007, p.12).

5.1 Event Study Framework

The objective of the event study applied in this thesis is to investigate whether there are any abnormal returns earned by security holders accompanying specific events, where an abnormal return is the difference between the observed return of a security and the expected return of the security (Peterson, 1989). Due to the fact that the effects of an event immediately will be reflected in security prices, the economic impact of an event can be constructed using security prices observed over a relatively short time period (MacKinlay, 1997). When starting an event study, the first task is to define the event of interest. The event this thesis will measure the effect of is the announcement of cross-border M&As, and more precisely acquisitions of enterprises in Scandinavia. The next task is to select the sample set of firms to include in the analysis. The third step is to identify the event and estimation window. The event window will in this case be the period over which the security prices of the acquired firms in Scandinavia will be examined. In most cases, the event window is defined to be larger than the specific period of interest, so that one is able to examine the periods surrounding the event. Finally, abnormal returns within the event window will be calculated. It is also sufficient to test whether the abnormal returns are significantly different from zero. MacKinley (1997) reports, that in many cases, the market may acquire information of the

event prior to the announcement day. This possibility can be examined by pre-event returns, and makes the period prior to the announcement day interesting to investigate.

Both statistical and economic models can be used in order to calculate the expected return of a given security. Economic models rely on assumptions concerning investors' behaviour and are not based solely on statistical assumptions. The Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT) are two common economic models which add restrictions to the statistical models in order to provide more constrained normal return models. In the CAPM, which was a commonly used model in event studies during the 1970s, the expected return of a given security is determined by its covariance with the market portfolio (MacKinlay, 1997). The CAPM requires a measure of the risk-free return in order to estimate the normal return, which can be an obstacle when implementing event studies to measure the effect of M&A in developing economies due to the underdeveloped government-issued securities markets (Ma, Pagán & Chu, 2009). In addition, the possibility that the results of studies may be sensitive to restrictions imposed by the CAPM has been discovered, and the use of the CAPM has become less common (MacKinlay, 1997). The Arbitrage Pricing Theory is a multifactor model which shows that if all securities' returns are affected by the common factors, expected returns are a function of the risk in the model (Binder, 1998). The expected return of a given security will thus be a linear combination of multiple factors. There is a potential gain from using the APT over the CAPM because the biases introduced by using the latter will be eliminated. However, the gains from using APT over the market model, which will be explained below, are small since the most important factor in the Arbitrage Pricing Model behaves like a market factor and the additional factors add relatively little explanatory power (MacKinlay, 1997).

MacKinlay(1997) states that statistical models seem to dominate in event studies because of their improvement over the economic models. Among the statistical models are the constant mean return model and the market model, which are the most common choices (MacKinlay, 1997). The constant mean return model is used to calculate mean-adjusted returns by subtracting the average return for stock *i* during the estimation period from the stock's return during the event period. The method used to calculate mean-adjusted returns does not explicitly control for the risk of the stock or the return on the market portfolio during the event period. The abnormal return estimators will have considerably greater variances in the constant mean return model than the market model disturbances (Binder, 1998). Since the market model represents a potential improvement over the constant mean return model, the

market model is chosen in order to calculate expected return in this thesis. The improvement from using the market model thus comes from the fact that the portion of return which is related to variation in the market's return is removed. This will reduce the variance of the abnormal return, and can lead to increased ability to detect event effects. The market model relates the return of a given security to the return of the market portfolio (MacKinlay, 1997).

5.2 Assumptions of the Event Study Methodology

The most important assumption of the event study methodology is that it presumes market efficiency (McWilliams & Siegel, 1997). An efficient market in the market efficiency hypothesis is a market in which security prices at any time fully reflect all available information. This extreme version of the hypothesis presumes that information and trading costs are always zero. Since there are certainly positive information and trading costs, this strong version of the market efficiency hypothesis is surely false. A weaker version of the hypothesis says that prices reflect information to the point where marginal benefits of acting on information do not exceed the marginal costs (Fama, 1970).

The market efficiency hypothesis rules out arbitrage opportunities. This is more easily explained by Jensen's (1978, p.3) general way to express the hypothesis: *''A market is efficient with respect to information set θ_t if it is impossible to make economic profits by trading on the basis of information set θ_t''*. The efficient market hypothesis can be divided into three categories; the weak form, the semi-strong form and the strong form of the efficient market hypothesis (Jensen, 1978).

The differences of the three categories of the efficient market hypothesis mainly revolve around the definition of the information set θ_t. In the weak form of the efficient market hypothesis, the information set θ_t is taken to be solely the information contained in the past price history of the markets as of time t, while in the semi-strong form, θ_t is taken to be all information that is publicly available, including the past history of prices, at time t (Jensen, 1978). The semi-strong form of the hypothesis thus implies that prices at any given time incorporate all publicly available information. The weak form of the efficient market hypothesis implies that stock prices follow a random walk since prices only respond to new information which arrives randomly, and that one cannot earn superior returns by taking

advantage of historical price movements (Frankfurter & McGoun, 2002). In the last version of the hypothesis, the strong form of the market efficiency hypothesis, θ_t is taken to be all information known to anyone at time t (Jensen, 1978). The strong form then implies that prices at any given time incorporate all information, whether public or private (Frankfurter & McGoun, 2002). Event studies are being used under the semi-strong form of the market efficiency hypothesis, which implies that prices should reflect all publicly available information, in order to examine the impact of some event on the wealth of the firm's security holders (Binder, 1998). The inference of significance of the results obtained from the event study methodology thus relies on the assumption that markets are efficient. In addition to the assumption of market efficiency, the event study methodology also relies on the assumptions that the event was unforeseen and that there were no cofounding effects during the event period under which the abnormal returns are being examined. The last assumption is critical because if other financially relevant events are occurring during the event period, it is difficult to isolate the impact of one particular event (McWilliams & Siegel, 1997).

The assumptions of the event study methodology can thus be listed as follows:

1) markets are efficient
2) the event was unanticipated
3) there were no cofounding effects during the event period

5.3 Determination of event and estimation Windows

The returns of a stock that are expected to be observed if no event occurs are called expected or normal returns (Peterson, 1989). The return of a share is to some extent correlated with the return of the stock market which it is a part of, and the expected return of a share over a period is therefore the return on the market over that period. Research on the effect of M&A on shareholders' value therefore needs an estimate of expected or normal returns for shares over some period of interest (Armitage, 2006). Normal returns are generally estimated over a time period other than the time period surrounding the event date. This time period is called the estimation window (Peterson, 1989).

Selection of the length of the event and estimation periods is left to the researcher, and is often chosen on the basis of previous studies (Peterson, 1989). After having defined the event of interest, which in this thesis will be acquisitions of Scandinavian target firms, the next task is to identify the period over which the security prices of the firms involved in this event will be examined; the event window (MacKinlay, 1997). The dissemination of news about a merger or an acquisition may extend over more than one day. The corporation may release the news one day, but it may not be reported by the financial press until the day after. It is thus unclear when the information reaches the market since the market participants may not have the information during market trading hours the day the corporation makes the announcement (Peterson, 1989).

In a perfectly efficient market, the event window could be restrained to only include the day of announcement, but in order to capture market reactions of announcements when it is unclear if the market has received the information during trading hours or if it is available only after the stock market has closed, the event window is thus extended to couple of days. In addition, there is always a possibility of information leakage prior to the announcement day (MacKinlay, 1997). The use of a very long event window implies that the researcher do not believe that the effect of an event is quickly incorporated into the stock price. This can be interpreted as a violation of the first assumption of the event study methodology, namely the assumption of market efficiency. The use of a long event window may also imply that the researcher believes that the event was anticipated, which violates assumption two explained above. In addition, the risk of experiencing cofounding events during the event window increases with the length of the event window. If cofounding events are experienced during the estimation window, the third assumption of the event study methodology will be violated (McWilliams & Siegel, 1997). The event window is typically of the same length for each stock, but over different calendar dates (Armitage, 2006).

Since this thesis looks at the effect of cross-border M&A on the short-term performance, an event window of five days will be chosen for each of the 98 stocks analysed, spanning from two days prior to the announcement day to two days after the announcement day. This choice is motivated by the length of the event window used in a short-term study by Walker (2000). By including two days before and after the announcement day in the event window, it is possible to capture market reactions in situations when the timing of dissemination of news is unclear. An advantage of studying the effect of cross-border M&A on the short-term performance comes from the fact that it is not necessary to control for the size of the firm. In

any study of long term effects, however, size effects will be of importance (Gregory, 1997). In addition, there will be no information other than the news of the merger or acquisition in the short run. The observed returns during the event period are therefore entirely due to this news. Since the method of payment has no impact on total short-run changes in value, it is not necessary to evaluate the effect of different methods of payment in the short run (Shleifer & Vishny, 2003).

While studies argue about the proper length of estimation window, most agree that the standard estimation period should be between 100 and 300 trading days. Inspired by Corrado (2011), who argues that a value of 250 days should be chosen to approximately correspond to the number of trading days during a calendar year, 250 days will be chosen as the length of the estimation window in this thesis.

Inspired by MacKinlay (1997), the event date is defined as $t = 0$, and $t = T_0 + 1$ to $t = T_1$ constitutes the estimation window, while $t = T_1 + 1$ to $t = T_2$ represents the event window in order for the estimation window and the event window not to overlap. This will provide estimators for the parameters of the normal return model which are not influenced by the returns around announcement days of acquisition. If the event and estimation windows were to overlap, this could lead to a situation where both the normal returns and the abnormal returns would capture the effect of the M&A announcement (MacKinlay, 1997).

The timing sequence can be illustrated by a timeline as in Figure 2, consistent with MacKinlay (1997), where the event day (day of announcement) is 0, the estimation window and event window are depicted by $(T_1 - T_0)$ and $(T_2 - T_1)$ respectively:
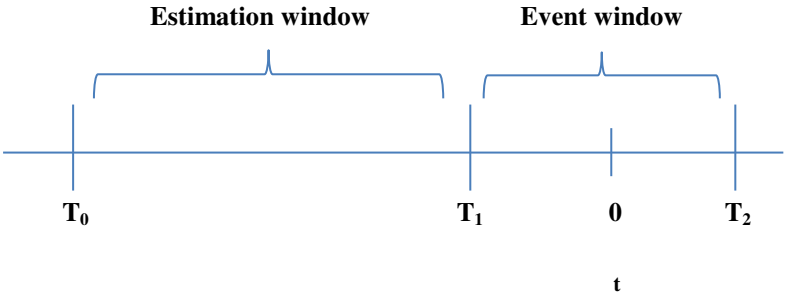
Figure 2: Timeline, source: MacKinlay (1997)

The estimation window from $T_0 + 1 = -252$ to $T_1 = -3$ will thus include the 250 days immediately prior to the start of the event window, which is spanning from two days prior to the announcement day to two days after the announcement day, thus from

$(T_1 + 1) = -2$ to $T_2 = 2$.

5.4 Calculation of abnormal returns

In order to find the effect of acquisition on target shareholders' value, a measure of the abnormal return is required. The abnormal return can be defined as the difference between the actual ex post return of the security over the event window, and the expected return, without conditioning on the event taking place, of the firm over the event window (MacKinlay, 1997). The expected return is thus the normal return which would have been expected if the firm had not been acquired. For firm i at time t, the abnormal return is

$$AR_{i,t} = r_{i,t} - E(r_{i,t}) \qquad (1)$$

where $AR_{i,t}$, $r_{i,t}$ and $E(r_{i,t})$ are the abnormal, actual and expected returns for a given stock at time t respectively.

By applying ordinary least squares (OLS), the relationship between the return of the security and the return of the market can be estimated:

$$r_{i,t} = \alpha_i + \beta_i\, r_{m,t} + \varepsilon_{i,t}, \; t = -252,..., -3 \qquad (2)$$

where $r_{i,t}$ is the return of security i at time t, and $r_{m,t}$ is the return of the benchmark market index at time t. $\varepsilon_{i,t}$ is the zero mean disturbance team, while α_i and β_i are the parameters of the market model to be estimated (MacKinlay, 1997).

Ordinary least squares (OLS) is a consistent estimation procedure for the market model under the Gauss-Markov Assumptions for Simple Regression, which state that the model is linear in parameters, that we have a random sample of size n, that the sample outcomes on r are not all the same value, and that the error ε has an expected value of zero given any value of the explanatory variable (Wooldridge, 2009, p.47). The OLS estimators of the parameters in the market model are consistent with MacKinlay (1997), and are as follows:

$$\hat{\beta}_i = \frac{\sum_{t=T_0+1}^{T_1} (r_{i,t} - \widehat{\mu_i})(r_{m,t} - \widehat{\mu_m})}{\sum_{t=T_0+1}^{T_1} (r_{m,t} - \widehat{\mu_m})^2} \tag{3}$$

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i \hat{\mu}_m \tag{4}$$

$$\hat{\sigma}_{\varepsilon_i}^2 = \frac{1}{L_1-2} \sum_{T_0+1}^{T_1} (r_{i,t} - \widehat{\alpha_i} - \widehat{\beta_i} r_{m,t})^2 \tag{5}$$

$$\hat{\mu}_i = \frac{1}{L_1} \sum_{t=T_0+1}^{T_1} r_{i,t} \tag{6}$$

$$\hat{\mu}_m = \frac{1}{L_1} \sum_{t=T_0+1}^{T_1} r_{m,t} \tag{7}$$

where $L_1 = T_1 - T_0$ is the length of the estimation window as depicted in figure 2 in the previous section.

Since the return in Datastream is expressed as an index, where the base date of the company is 100 and the return evolves each day from here on, the actual return of security i will be defined as the logarithm of the change in return indices (RI) on day t and day t-1 of security i:

$$r_{i,t} = \ln (R_{i,t} / R_{i,t-1}) \qquad (8)$$

The market return will be calculated over the chosen estimation period as the logarithm of the change in market return indices (MRI) on day t and day t-1:

$$r_{m,t} = \ln (MRI_t / MRI_{t-1}) \qquad (9)$$

The return indices for the stocks as well as the Scandinavian markets have been collected from Datastream. The calculation of the actual return of the securities and market returns are inspired by Gopikrishnan, Plerou, Amaral, Meyer and Stanley (1999), who calculates the return for a time series of prices or market index values over a time scale as the forward change in logarithm of the time series.

The market model which is applied in this thesis follows the framework of MacKinlay (1997), and will be described further below.

The abnormal returns will be the residuals from the regression of the OLS estimation, and is thus the difference between the observed return and the expected predicted return for stock i at time t:

$$\widehat{AR}_{i,t} = r_{i,t} - (\widehat{\alpha}_i + \widehat{\beta}_i r_{m,t}) = \varepsilon_{i,t} , t = -2,...,2 \qquad (10)$$

A value of the error term which is significantly different from zero represents an excess return earned by the shareholders of the firm (McWilliams & Siegel, 1997).

In order to capture the total effect of the stock-movements during the period when the market might respond to news about M&A, the abnormal return observations must be aggregated over the period of the event window. The abnormal return observations can be aggregated both through time and across securities. The cumulative abnormal return (CAR) for a given stock is first calculated over time in order to accommodate a multiple period event window:

$$\widehat{CAR}(t_1, t_2) = \sum_{t=-2}^{2} \widehat{AR}_{i,t} \qquad (11)$$

Sample aggregated abnormal returns for period t (average abnormal return), where N is the number of acquisition announcements, will then be:

$$\overline{AR_t} = \frac{1}{N}\sum_{i=1}^{N} \widehat{AR}_{i,t} \qquad (12)$$

For a large estimation window, its variance will be

$$var(\overline{AR_t}) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma_{\varepsilon_i}^2 \qquad (13)$$

Cumulative average abnormal return through time and across securities can be found by aggregating average abnormal return for period t:

$$\overline{CAR}(t_1, t_2) = \sum_{t=-2}^{2} \overline{AR}_t \qquad (14)$$

The cumulative average abnormal return can be calculated for any interval in the event window (MacKinlay, 1997). If preferable, this makes it possible to compare the cumulative average abnormal return on intervals before and after the announcement day.

The variance of the cumulative average abnormal return is

$$var(\overline{CAR}(t_1, t_2)) = \sum_{t=-2}^{2} var(\overline{AR}_t) \tag{15}$$

or alternatively

$$var(\overline{CAR}(t_1, t_2)) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_i^2 (t_1, t_2)) \tag{16}$$

where

$$\sigma_i^2(t_1, t_2) = (t_2 - t_1 + 1) \, \hat{\sigma}_{\varepsilon_i}^2 \tag{17}$$

5.5 Test statistics

The null-hypothesis being tested is stated as:

H_0: Cross-border M&A announcements have a negative or no effect on the abnormal returns for target firm shareholders in Scandinavia in the short term

while the alternate hypothesis is stated as:

H_1: Cross-border M&A announcements have a positive effect on the abnormal returns for target firm shareholders in Scandinavia in the short term.

In order to test the null hypothesis, inferences about the cumulative average abnormal returns can be drawn using

$$\overline{CAR}(t_1,t_2) \sim N[0, var(\overline{CAR}(t_1,t_2))] \qquad (18)$$

The sample variance measure of $\sigma_{\varepsilon_i}^2$ from the market model regression in the estimation window is chosen as an estimator to calculate the variance of the abnormal returns (MacKinlay, 1997).

In order to reach the conclusion on whether the cumulative abnormal returns are significantly different from zero on each of the days during the event period, this thesis uses both parametric and non-parametric tests. Parametric tests were the first tests to gain wide use in the development of modern techniques of statistical inference. A characteristic of the parametric tests are that they make assumptions about the nature of the population from which the observations are drawn (Siegel, 1957).

The parametric test statistics proposed by MacKinlay (1997) in order to test whether the cumulative average abnormal returns are significantly different from zero in the period surrounding the event date, is

$$\theta_1 = \frac{\overline{CAR}(t_1,t_2)}{var(\overline{CAR}(t_1,t_2))^{1/2}} \sim N(0,1) \qquad (19)$$

The test statistic is distributed asymptotically normally with mean equal 0 and standard deviation equal 1. The statistical tests used to detect abnormal stock returns require the use of the standard error of the estimate from the regression analysis using estimation period returns (Peterson, 1989). The standard error for this test is therefore computed from the time-series of portfolio average abnormal returns during the estimation period, and avoids the potential problem of cross-sectional correlation of security returns (Fadl, 2011).

In addition to a parametric testing procedure, many event studies also use non-parametric tests to offer confirmation of the results (Armitage, 2006). Non-parametric tests do not make stringent assumptions about the population, and can also be used with non-numerical data (Siegel, 1957). Non-parametric tests are thus often provided in addition to the parametric tests of the abnormal returns because the assumption of normally distributed security returns may not be correct (Peterson, 1989).

According to MacKinlay (1997), the basic of the sign test, which is used as the non-parametric test in this thesis, is that under the null hypothesis, it is equally probable that the abnormal returns will be positive or negative. The sign test is used to support the findings of the parametric tests, but it is important to keep in mind that the sign test may not be well specified if the distribution of abnormal returns is skewed, which the case is for the distribution of abnormal returns on some of the days in the event period (MacKinlay, 1997). Following the null hypothesis above that there is a negative or no abnormal return associated with an announcement of cross-border M&A, the null hypothesis under the sign test is

$$H_0: p \leq 0{,}5$$

where p is the probability that the abnormal return is positive. The alternate hypothesis under the sign test is then

$$H_1: p > 0{,}5$$

The test statistic used for each of the five days in the event period follows the framework of MacKinlay (1997), and is as follows

$$\theta_2 = \left(\frac{N^+}{N} - 0{,}5\right) * \frac{\sqrt{N}}{0{,}5} \sim N(0,1) \tag{20}$$

where N is the total number of cases, and N^+ is the number of cases where the abnormal return is positive.

6 Empirical evidence

This thesis investigates whether the announcement of cross-border M&A generates value to the shareholders of target firms in Scandinavia by examining the effect of the event on stock prices. The event study methodology used in the thesis has made it possible to remove general stock price movements in order to separate out the effect of the event.[8]

The assumptions of the Event Study Methodology applied in this thesis are the basis for the results presented in this chapter. The empirical findings in this thesis suggest that an average abnormal return of 12.01% is realized on the announcement day[9]. The result is significantly different from zero at a 1% significance level. The findings of this thesis therefore suggest that the main effect of cross-border M&A announcements on target firm shareholders value is positive.

The findings also suggest a significant positive effect of the event on stock prices one and two days prior to the announcement day, even though the effect is less significant than what has been observed on the actual day of announcement. Two days prior to the announcement day, target firms experience a gain of 1.18%, while they experience a smaller gain of 0.96% on the day prior to the announcement day. The t-test shows that the results are significantly different from zero at a 1% significance level. The positive effect on the days in the event window prior to the announcement day may have been observed because the market had acquired information of the event before some of the mergers and/or acquisitions were announced. As explained in the discussion on choice of length of event window, positive average abnormal returns may be observed on days prior to the announcement day because of information leakage or rumours.

The obtained results from this study suggest that the announcement of cross-border M&A will generate positive average abnormal returns for target firm shareholders on the first day subsequent to the announcement day. The empirical findings of this thesis suggest that target firms experience a small gain of 0.56% this day. This result may be due to the fact that news of some mergers and/or acquisitions reached the market after trading hours, making it impossible for market participants to react to the news on the actual announcement day. It is therefore possible that market reactions to some of the announcements have been delayed to

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[8] The OLS estimators of the market model parameters used in this thesis is given in appendix C.

[9] See appendix D for abnormal returns on the day in the event period

the following day. The positive effect on the day following the announcement day is however only significant at a 10% significance level when performing a t-test.

The second day following the announcement day shows a negative average abnormal return of -0.02% for the target firms in the sample. A negative value of the test statistic will lead to a failure in rejecting the null hypothesis no matter how large in absolute value (Wooldridge, 2009, p.123). We therefore fail to reject the null hypothesis that cross-border M&A announcements have no or a negative effect on the abnormal returns for target firm shareholders in Scandinavia on this day. It is therefore not possible to draw any conclusion about the second day following the announcement day.

Average abnormal return for each day in the event window has been calculated and is depicted below. The graph shows that the main effect of cross-border M&A is isolated on the event day (t = 0).

Figure 3: Average Abnormal Returns during event period

Source: Own illustration using data collected from Thomson Reuters Datastream (2012)

Figure 3 indicates that the market reacts positively to the announcement of cross-border M&A in the short term, and that the most dramatic reaction from the market clearly comes at the actual day of announcement. The large difference between the average abnormal returns on the announcement day and the remaining days in the event period can be explained by the fact that the main part of the news on M&As comes on the announcement day. However, since the null hypothesis (that the announcement of cross-border M&A has no or a negative effect on target shareholders value on days t = -2 and t = -1) is rejected, the possibility that information on M&As reaches the market before the announcement day cannot be ruled out.

In order to get a better picture of how substantial the market reaction to the news of M&A on the day of the event is, it can be helpful to look at the average abnormal returns during a period when no event occurs. The average abnormal returns during the estimation period for each of the stocks in the sample is depicted in figure 4 below, and shows that the average abnormal return fluctuates around zero in the absence of news on M&A.
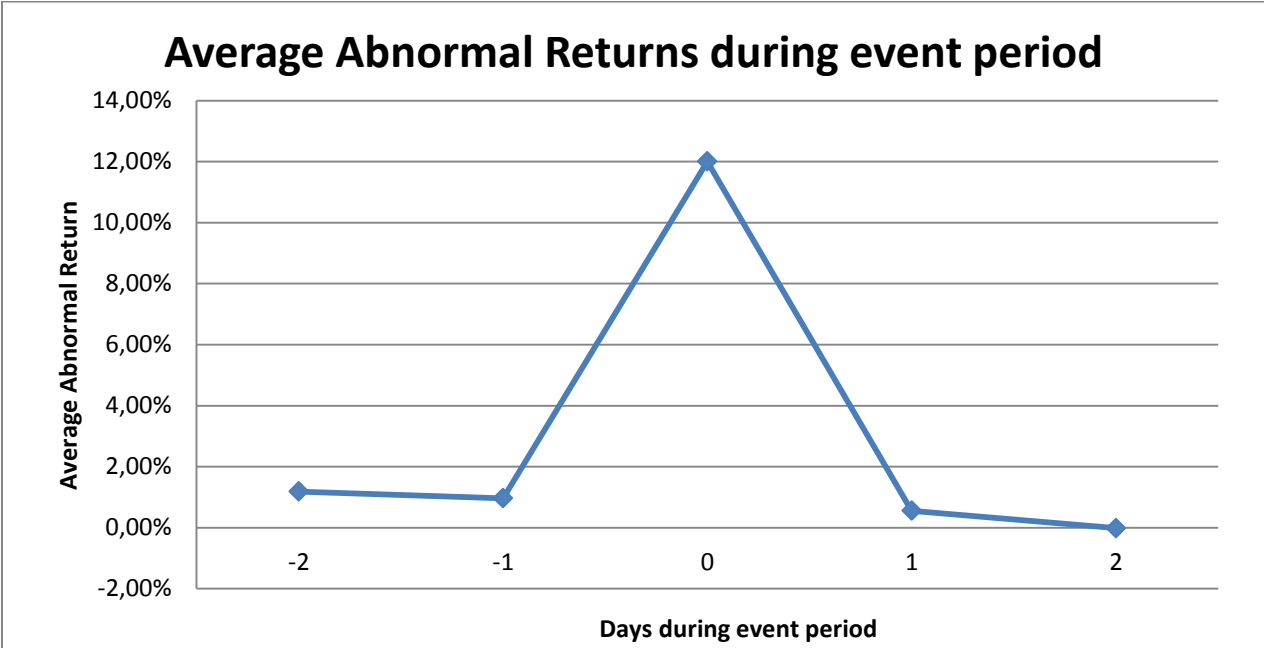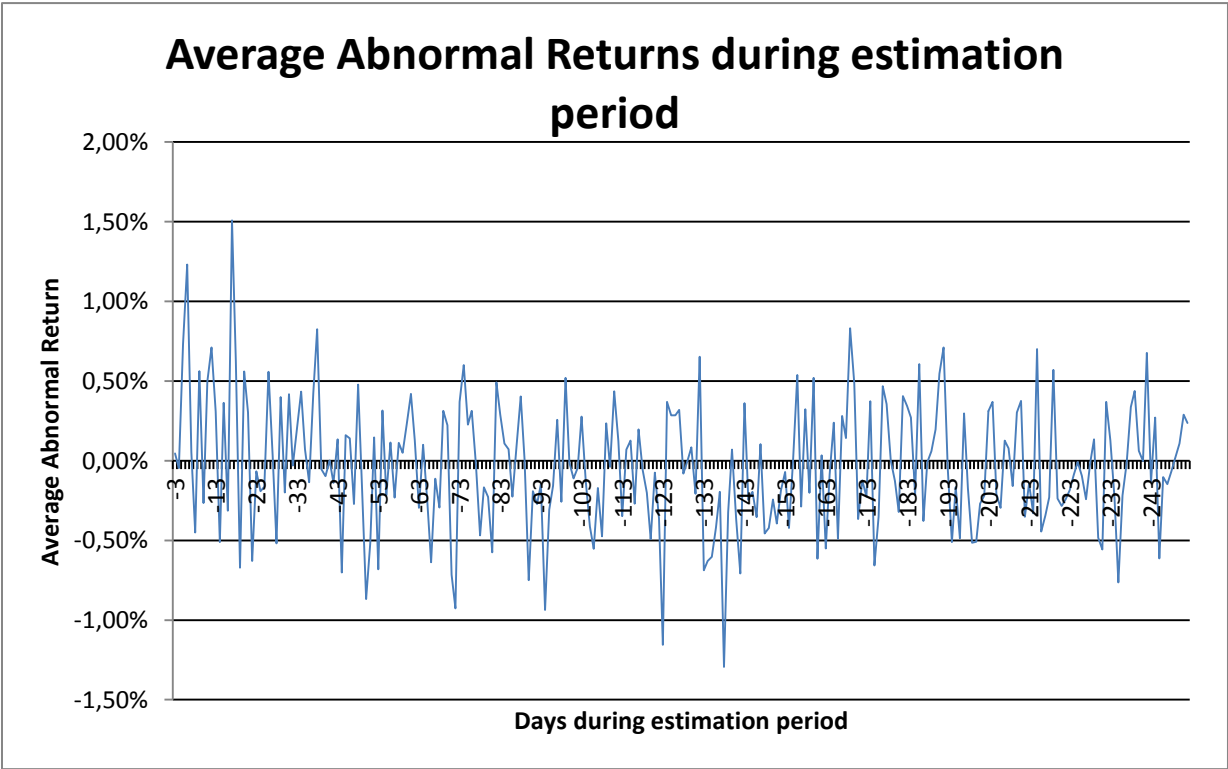

Figure 4: *Average Abnormal Returns during estimation period*

Source: Own illustration using data collected from Thomson Reuters Datastream (2012)

As mentioned in the previous chapter, both parametric and non-parametric test statistics have been used to test inferences in this thesis. However, according to Berry, Gallinger & Henderson, Jr. (1990), researchers should exercise caution in drawing inferences from their use of non-parametric tests because of the nature of the residuals distribution. This suggests that parametric tests are preferable to non-parametric ones, and this thesis will therefore place emphasis on the results generated from the parametric test[10]. The main objective for the non-parametric test used in the thesis is to confirm the results of the parametric test on the announcement day, which is the day when the main effect of cross-border M&A is observed. The following table shows the average abnormal return of the stocks in the sample for each of the days in the event window with their appropriate test statistics.

Day of event period	-2	-1	0	1	2
Average Abnormal Return	1.18 %	0.96 %	12.01 %	0.56 %	-0.02 %
Parametric test	2.95	2.4	29.93	1.39	-0.04
Non-parametric test	-0.2	0	5.86	-0.2	-2.42

Table 2: Average Abnormal Returns during the event period and test statistics

The underlined numbers in the table are test statistics that are statistically significant at the 1% significance level.

Source: Own calculation and illustration using data from Thomson Reuters Datastream (2012)

It is worth noticing that the average abnormal return on the first day following the announcement day (t = 1) is also statistically significant, but only at the 10% significance level. The test statistic of the non-parametric test on the announcement day (t = 0) is statistically significant at the 1% significance level, and confirms that the average abnormal return on the announcement day is positive.

In addition to calculating the average abnormal returns, the cumulative average abnormal return has been calculated for the event period by aggregating the average abnormal returns

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[10] See appendix E for the variances of abnormal returns and cumulative abnormal returns

over the event window, or equivalently, by aggregating the cumulative average returns for each security over the event window divided by the number of shares. This thesis found a cumulative average abnormal return of 14.7% over a five day period in the event window. This result indicates a substantial positive market reaction to the announcement of cross-border M&A.

The concept of a cumulative average abnormal return is necessary in order to capture the entire effect of the announcement of M&A since some of the market reaction to the news of M&A may come on the days surrounding the announcement day in the event window. The announcement effect of 14.7% is statistically significant at the 1% significance level using both parametric and non-parametric tests. The test statistics for the parametric and non-parametric tests are $\theta_1 = 16.38$ and $\theta_2 = 5.85$ respectively.

The empirical findings of this analysis thus show a positive and significant average abnormal return on the two days prior to the announcement, on the actual day of the announcement and on the first day following the announcement. These findings result in a statistically significant cumulative average abnormal return of 14.7% for the target firms during the event period. We can therefore, based on the results from this thesis, reject the null hypothesis that the announcement of cross-border M&A has a negative or no effect on target shareholders value in Scandinavia in the short-term.

7 Evaluation and suggestions for further research

Even though the findings from the empirical analysis in this thesis suggest that the announcement of cross-border M&A generates value to target firm shareholders in Scandinavia, a more extended research on mergers and acquisitions in Scandinavia would be useful in order to analyse the underlying factors of success and failure.

The purpose of this thesis has been to investigate the effect of cross-border M&A announcements, where the effect on wealth of Scandinavian target firms has been the main aspect being analysed. Considering the scope of countries engaging in acquisitions of Scandinavian firms[11], there are without doubt large differences in the political and legal systems, cultures, languages and corporate governance between the acquiring and target firms of the sample in this thesis. A larger sample of bidder and target firms would make it possible to test whether *the negative spillover by law hypothesis* is supported for cross-border M&A in the Scandinavian countries. This will imply that the value of the target assets could be reduced when they are in the hands of a bidder with less strict corporate governance regulation[12]. The alternate hypothesis, *the positive spillover by law hypothesis*, could also be fruitful to test, but would probably generate more interesting results if Scandinavian firms were to be treated as bidders instead of targets because of the quality of corporate governance standards in the countries. This hypothesis could be tested by looking at the abnormal share price returns of bidder and target in the period surrounding the announcement of an acquisition when the bidder is subject to better corporate governance than the target. Since improved governance is expected to generate additional value, this value creation should be reflected in the abnormal share price returns of both the bidder and the target[13].

A larger sample of bidder and target firms would also make it possible to test whether certain types of take-overs are more successful than others. This thesis has made no distinction between horizontal, vertical and conglomerate M&As[14] when measuring the announcement effect of cross-border M&A on shareholders' value due to limited access to data. However, if

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[11] See appendix B
[12] See section 2.3.3
[13] See section 2.3.3
[14] See section 2.1

granted access to more extensive information on the bidder and target firms, an interesting take on the investigation of cross-border M&A would be to study the difference in value generated to shareholders under the different types of M&A. The same goes for exploring the difference in value generated to shareholders in Scandinavia under friendly versus hostile take-overs.

As explained in section 2.3.3, the success rate of acquisitions may in large scale depend on the due diligence process. An external financial advisor is often engaged in this process in order to help the acquirer find the right target. Event studies can be applied to investigate whether the cumulative abnormal return in the period surrounding the announcement day or the post-acquisition period is higher for acquiring firms that had the help of a financial advisor in the acquisition process.

Some of the mentioned suggestions for further research may give more interesting findings when looking at the effect of M&A in the long run. The same is true for an investigation of the effect of M&A when considering different methods of payment, such as cash payment and security payment, or mixed, since the method of payment has no impact on total short-run changes in value. However, the aspect of an acquisition deal which concerns the method of payment is very is interesting taking into account that prior research finds that shareholders of both target and bidding firms gain significantly more in cash than in equity offers (Danbolt & Maciver, 2012).

An interesting alternative to the investigation of the effect of cross-border M&A on the wealth of Scandinavian target firms could be to study the same effect on the wealth of Scandinavian bidder firms, since studies show that the effect of M&A announcement on the wealth of the acquiring firms is unclear. As mentioned in the literature review, about half of the existing studies on the subject report zero or small returns for the acquirers in USA. An investigation of Scandinavian acquiring firms' performance in the post-acquisition period may give new insight to previous studies, and may also be extended to include questions of why there might be a difference in the performance of acquiring and target firms.

This study has omitted research on domestic deals within each of the Scandinavian countries since the research in this field is extensive compared to the analyses of cross-border deals. However, a comparison of the announcement effect of M&A in the cases of domestic and cross-border deals could be very relevant in order to see whether the benefits from acquiring or being acquired by a foreign firm exceed the obstacles connected with cross-border deals.

Another research area which is left unexplored for the Scandinavian market is the difference in post-acquisition performance between firms that engage in M&A, and firms that do not choose to engage in M&A. This type of analysis can be carried out by the use of the difference-in-difference methodology and propensity score matching methods (see e.g. Bertrand & Zitouna (2008)). An investigation of firms that choose to engage in M&A can bring further insight to firm specific factors of the relevant firms which may help to explain what characterizes the firms that choose to engage in M&A.

8 Conclusion

The purpose of this thesis has been to investigate the announcement effect of cross-border M&A on target firm shareholders value in Scandinavia in the short run. A sample of 98 Scandinavian target firms has been analysed in the time span between 1997 and 2011 in order to find empirical evidence that support the hypothesis that announcement of cross-border M&A generates value for target firm shareholders in Scandinavia in the short run.

The event study methodology was applied in order to analyse abnormal returns to target shareholders over a period of five days surrounding the announcement day of cross-border M&A in Scandinavia. The objective of choosing a short event period, under which the returns of the stocks are examined, is that there will generally be no information other than the news of the merger or acquisition during this period, and the observed returns should therefore be entirely due to this news.

This study finds that the announcement of cross-border M&A generates a significant positive value for target firm shareholders in Scandinavia in the short run. The empirical results obtained from the event study methodology suggest that target firm shareholders in Scandinavia receive a substantial significant and positive average abnormal return on the announcement day of cross-border M&A.

The findings of this thesis also suggest significant and positive abnormal returns on both of the days prior to the announcement day. The positive abnormal returns on the days in the event period that are prior to the announcement day may have been observed be due to dissemination of news of some of the takeovers before the actual day of announcement, which often occur due to insider trade or rumours.

 In addition to the positive average abnormal returns observed two days prior to the announcement day, the analysis finds empirical evidence that target shareholders experience a positive and significant average abnormal return on the first day following the announcement of the takeovers. A positive average abnormal return on the day following the announcement day may have been observed due to situations where the market has been unable to respond to the news of M&A on the actual day of the announcement, which is often the case when M&As are announced after trading hours. Since the market is not able to respond to the news on the announcement day, the effect of the announcement will be delayed until the next day.

According to the findings in this thesis, target firm shareholders experience a small negative average abnormal return on the second day following the announcement day. However, the result obtained on the last day of the event period is not statistically significantly different from zero. It is therefore not possible to draw any conclusions on whether the announcement of M&A has an effect on target firm shareholders value on the second day after the announcement.

The combined average abnormal returns on each of the days in the event period result in a significant and positive cumulative average abnormal return. The objective of calculating the cumulative average abnormal return is to capture the whole effect of the announcement of cross-border M&A; which is found to be 14.7% for the event period in this study.

Empirical evidences in this thesis thus suggest that cross-border M&A announcements will generate value for target shareholders in Scandinavia in the short-run. The observed effect of positive market reactions to the news of cross-border M&A reflect changes in expected future cash-flows to shareholders due to the positive effects which may emerge from a take-over. The results obtained in this thesis are consistent with prior empirical findings on the announcement effect of cross-border M&A on target shareholders' value.

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Appendices

Appendix A

Table A.1:

Number of inward M&As in Sweden in the time span between 1997 and 2011

Year	No of inward M&As in Sweden
1997	38
1998	121
1999	124
2000	129
2001	131
2002	99
2003	70
2004	90
2005	121
2006	140
2007	121
2008	134
2009	76
2010	93
2011	109
Total	1596

Source: Thomson Reuters Datastream (2012)

Table A.2:

Number of inward M&As in Norway in the time span between 1997 and 2011

Year	No of inward M&As in Norway
1997	15
1998	67
1999	70
2000	79
2001	64
2002	45
2003	59
2004	54
2005	60
2006	67
2007	71
2008	81
2009	43
2010	56
2011	56
Total	887

Source: Thomson Reuters Datastream (2012)

Table A.3:

Number of inward M&As in Denmark in the time span between 1997 and 2011

Year	No of inward M&As in Denmark
1997	32
1998	70
1999	52
2000	73
2001	67
2002	46
2003	59
2004	68
2005	76
2006	88
2007	68
2008	66
2009	57
2010	64
2011	56
Total	942

Source: Thomson Reuters Datastream (2012)

Table A.4:

Total number of inward M&As in Scandinavia in the time span between 1997 and 2011

Year	Total number of inward M&As in Scandinavia
1997	85
1998	258
1999	246
2000	281
2001	262
2002	190
2003	188
2004	212
2005	257
2006	295
2007	260
2008	281
2009	176
2010	213
2011	221
Total	3425

Source: Thomson Reuters Datastream (2012)

Appendix B:

Table B.1: Number of cross-border M&As in Sweden by country of acquirer

Target: Sweden

Country	No of take-overs in Sweden
USA	251
Norway	242
Finland	218
Great Britain	202
Denmark	191
Germany	102
France	73
Netherlands	71
Canada	42
Switzerland	34
Italy	23
Belgium	22
Iceland	12
Austria	11
Ireland	11
Japan	10
India	9
Singapore	9
Luxemborg	8
Australia	7
Bermuda	7
Poland	5
Spain	5
China	3
Greece	3
Hong Kong	3
South Africa	3
Cyprus	2
Israel	2
Lithuania	2
Maltha	2
Russian Federation	2
Turkey	2
Brazil	1
Cayman Islands	1
Colombia	1
Costa Rica	1
Saudi Arabia	1
Taiwan	1
Unites Arab Emirates	1
Total	1596

Source: Thomson Reuters Datastream (2012)

Table B.2: Number of cross-border M&As in Norway by country of acquirer.

Target: Norway

Country	No of take-overs in Norway
Sweden	230
USA	129
Denmark	118
Great Britain	97
Finland	69
Germany	41
Netherlands	39
France	27
Canada	15
Iceland	15
Switzerland	13
Belgium	12
Bermuda	8
Italy	8
Cyprus	6
Australia	5
Austria	5
Spain	5
Greece	4
Ireland	4
Japan	4
China	3
India	3
Marshall Irelands	3
Singapore	3
Bahrain	2
Brazil	2
Cayman Islands	2
Israel	2
Luxemborg	2
Malaysia	2
Poland	2
Hungary	1
Oman	1
Portugal	1
Russian Federation	1
Saudi Arabia	1
South Africa	1
South Koreas	1
Total	887

Source: Thomson Reuters Datastream (2012)

Table B.3: Number of cross-border M&As in Denmark by country of acquirer.

Target: Denmark

Country	No of take-overs in Denmark
Sweden	228
USA	142
Norway	100
Great Britain	96
Germany	82
Netherlands	55
Finland	39
Switzerland	32
France	31
Iceland	30
Belgium	11
Italy	10
Austria	9
Ireland	8
Luxemborg	7
India	6
Russian Federation	6
Australia	5
Canada	5
Cyprus	4
Japan	3
Poland	3
Singapore	3
Virgin Islands	3
Bermuda	2
Faroe Islands	2
Israel	2
Spain	2
Taiwan	2
Bahamas	1
Bahrain	1
Barbados	1
Brazil	1
Chile	1
Croatia	1
Czech Republic	1
Kuwait	1
Liechtenstein	1
Mexico	1
Portugal	1
Quatar	1
Thailand	1
Turkey	1
Total	942

Source: Thomson Reuters Datastream (2012)

Appendix C

Table C.1: OLS estimators of the market model parameters

Firm i	$\hat{\alpha}$	$\hat{\beta}$
1	,001	,994
2	,002	,764
3	-,003	,822
4	,000	,631
5	-,004	,830
6	,001	1,065
7	,000	,186
8	,002	,555
9	-,001	,236
10	,000	,174
11	,000	,775
12	,001	1,302
13	,001	,112
14	-,002	1,145
15	,001	,166
16	,000	,527
17	,000	1,049
19	,003	,446
20	,000	,408
21	-,001	1,242
22	,002	,533
23	,002	,177
18	,001	,494
24	,003	,381
25	,001	1,294
26	-,001	1,472
27	-,002	,701
28	,000	1,238
29	,001	,216
30	,001	,027
31	,002	,309
32	,000	,536
33	-,003	,786
34	,002	,038
35	,000	,076
36	,000	,130
37	-,001	1,238
38	,001	1,845
39	,002	,557
40	,002	,385

41	-,003	,855
42	,000	1,407
43	,002	,422
44	-,004	,463
45	,001	,053
46	,001	,456
47	,000	,376
48	-,001	,541
49	,000	,228
50	,000	,181
51	-,002	,378
52	-,003	,481
53	,002	,375
54	,000	,061
55	,000	,760
56	,000	,534
57	-,001	,176
58	-,002	,368
59	,001	,226
60	,003	,455
61	,001	,387
62	,000	,611
63	-,011	1,391
64	,000	,070
65	,004	,355
66	,000	,763
67	-,001	,592
68	-,004	1,008
69	,000	,199
70	,001	,922
71	-,001	,666
72	-,002	,698
73	,002	,472
74	-,006	1,161
75	-,001	,160
76	,000	-,203
77	-,004	,838
78	-,002	,878
79	-,005	,318
80	-,003	,666
81	-,001	,076
82	,000	,091
83	-,012	,523
84	-,002	,483
85	,000	,156
86	,000	-,037

87	-,006	-,074
88	-,002	,558
89	,000	1,176
90	,001	,169
91	,002	,252
92	,000	-,048
93	-,001	,174
94	-,002	1,172
95	,001	,507
96	,000	,121
97	-,002	,473
98	,001	,182

See section 5.4 for the formula used to estimate the market model parameters

Source: Own calculation of OLS estimators based on data collected from Thomson Reuters Datastream (2012)

Appendix D

Table D.1: Abnormal returns of the stocks in the sample during the event period

Firm i	$\widehat{AR}_{i(-2)}$	$\widehat{AR}_{i(-1)}$	$\widehat{AR}_{i0}$	$\widehat{AR}_{i1}$	$\widehat{AR}_{i2}$	$\sum_{t=-2}^{2}\widehat{AR}_{it}$
1	-0,36 %	0,66 %	-0,63 %	-0,72 %	-0,87 %	-1,91 %
2	-0,06 %	-0,82 %	1,06 %	3,32 %	0,61 %	4,11 %
3	1,07 %	0,79 %	0,61 %	-1,28 %	-0,15 %	1,03 %
4	-1,18 %	2,06 %	4,91 %	0,24 %	0,12 %	6,15 %
5	0,92 %	-0,01 %	6,15 %	2,59 %	1,59 %	11,23 %
6	4,00 %	3,92 %	10,50 %	-0,22 %	-0,02 %	18,17 %
7	0,71 %	17,33 %	0,77 %	1,60 %	-0,75 %	19,65 %
8	0,62 %	1,92 %	1,59 %	1,59 %	-0,47 %	5,25 %
9	0,53 %	1,64 %	37,03 %	-1,20 %	0,14 %	38,14 %
10	0,88 %	0,20 %	-13,80 %	-4,67 %	1,04 %	-16,34 %
11	-0,25 %	-1,09 %	6,96 %	1,09 %	-0,36 %	6,35 %
12	-0,37 %	-0,81 %	2,77 %	1,32 %	0,52 %	3,44 %
13	-0,40 %	4,05 %	24,67 %	-0,51 %	-0,18 %	27,64 %
14	-0,25 %	-0,30 %	10,27 %	2,53 %	1,68 %	13,93 %
15	6,49 %	-1,31 %	27,92 %	-4,17 %	-0,89 %	28,05 %
16	-1,13 %	0,73 %	6,70 %	-0,29 %	-0,34 %	5,66 %
17	-0,63 %	2,23 %	3,56 %	1,01 %	1,70 %	7,87 %
18	-0,18 %	0,83 %	4,57 %	-0,20 %	-0,57 %	4,44 %
19	0,57 %	-0,76 %	16,45 %	-0,84 %	0,31 %	15,72 %
20	0,56 %	2,82 %	2,18 %	-0,14 %	-1,57 %	3,86 %
21	-0,49 %	-2,65 %	-1,55 %	1,04 %	3,39 %	-0,26 %
22	-0,44 %	0,45 %	-0,83 %	0,10 %	-4,84 %	-5,56 %
23	-1,20 %	6,17 %	20,42 %	0,41 %	0,14 %	25,94 %
24	5,19 %	2,03 %	4,78 %	-0,28 %	1,78 %	13,51 %
25	4,38 %	-0,41 %	13,87 %	-7,21 %	-0,09 %	10,54 %
26	-0,85 %	1,09 %	25,09 %	-0,30 %	-0,17 %	24,85 %
27	-0,91 %	0,24 %	49,35 %	-0,20 %	1,47 %	49,95 %
28	1,75 %	2,86 %	6,19 %	-7,61 %	0,90 %	4,09 %
29	0,76 %	-0,11 %	14,35 %	0,98 %	-0,22 %	15,77 %
30	-0,34 %	0,13 %	92,15 %	-0,13 %	-0,13 %	91,69 %
31	-0,12 %	-0,48 %	2,86 %	-0,21 %	0,10 %	2,16 %
32	-0,45 %	-0,49 %	2,57 %	0,60 %	0,93 %	3,16 %
33	1,43 %	-4,11 %	21,56 %	4,12 %	-1,76 %	21,23 %
34	-0,20 %	-0,18 %	0,83 %	-0,33 %	-0,03 %	0,08 %
35	-0,11 %	0,05 %	0,65 %	-0,34 %	-0,13 %	0,11 %
36	6,16 %	-3,07 %	20,35 %	-1,03 %	0,37 %	22,78 %
37	-1,49 %	-0,97 %	35,12 %	-0,34 %	-3,23 %	29,09 %

38	0,38 %	0,15 %	-25,36 %	-7,32 %	4,86 %	-27,28 %
39	-2,92 %	-0,47 %	5,42 %	-1,57 %	-0,79 %	-0,32 %
40	-4,11 %	3,62 %	10,70 %	-0,26 %	-0,01 %	9,94 %
41	0,60 %	-0,73 %	1,38 %	0,45 %	3,27 %	4,96 %
42	-1,48 %	-4,43 %	5,68 %	6,01 %	-0,43 %	5,34 %
43	4,01 %	1,59 %	-7,32 %	0,37 %	-0,50 %	-1,85 %
44	-6,30 %	-0,31 %	83,77 %	-0,61 %	0,30 %	76,84 %
45	0,47 %	-0,14 %	0,62 %	-0,15 %	-0,03 %	0,78 %
46	4,24 %	15,98 %	1,26 %	0,26 %	1,53 %	23,25 %
47	6,31 %	-0,03 %	37,23 %	0,30 %	-5,46 %	38,34 %
48	0,56 %	0,52 %	40,48 %	0,38 %	-0,40 %	41,53 %
49	-0,40 %	-0,21 %	-0,18 %	-0,42 %	0,54 %	-0,68 %
50	-0,45 %	0,17 %	27,25 %	1,21 %	-0,49 %	27,69 %
51	-1,40 %	0,87 %	4,02 %	-2,81 %	11,13 %	11,80 %
52	-2,18 %	1,17 %	-4,49 %	2,65 %	-3,07 %	-5,92 %
53	0,72 %	-1,68 %	0,18 %	-0,24 %	-0,25 %	-1,26 %
54	0,03 %	0,03 %	0,08 %	55,49 %	-0,58 %	55,04 %
55	10,26 %	0,20 %	6,47 %	1,01 %	-2,72 %	15,22 %
56	1,08 %	-1,48 %	0,44 %	-1,27 %	-0,41 %	-1,63 %
57	0,08 %	-0,38 %	5,24 %	-5,86 %	-1,97 %	-2,90 %
58	1,43 %	0,92 %	11,97 %	-4,36 %	-2,09 %	7,88 %
59	12,54 %	-0,07 %	36,02 %	-0,88 %	-0,09 %	47,52 %
60	-2,36 %	31,11 %	6,36 %	-0,32 %	0,66 %	35,45 %
61	-0,25 %	0,37 %	26,39 %	-2,33 %	-2,54 %	21,63 %
62	3,09 %	-2,40 %	23,65 %	-0,83 %	-0,13 %	23,38 %
63	-0,93 %	3,29 %	-2,57 %	3,46 %	4,54 %	7,79 %
64	2,62 %	-0,37 %	77,39 %	0,08 %	-0,11 %	79,62 %
65	-0,64 %	22,31 %	0,68 %	1,56 %	-0,69 %	23,22 %
66	0,49 %	1,27 %	18,28 %	1,62 %	-1,05 %	20,61 %
67	3,20 %	0,12 %	21,10 %	-10,10 %	5,49 %	19,82 %
68	-0,69 %	1,75 %	6,60 %	2,60 %	-1,03 %	9,23 %
69	0,27 %	8,64 %	4,44 %	-2,01 %	1,59 %	12,93 %
70	0,14 %	-2,92 %	48,09 %	-0,84 %	-0,78 %	43,69 %
71	0,46 %	-0,07 %	0,00 %	0,21 %	-0,15 %	0,45 %
72	3,13 %	-2,96 %	-1,67 %	-2,34 %	-2,84 %	-6,69 %
73	-0,70 %	-0,28 %	2,04 %	0,00 %	-1,77 %	-0,70 %
74	2,84 %	1,05 %	0,36 %	3,26 %	-0,04 %	7,47 %
75	-0,01 %	0,00 %	0,40 %	1,04 %	0,46 %	1,89 %
76	47,31 %	0,65 %	0,22 %	-0,12 %	-0,03 %	48,03 %
77	-5,12 %	11,06 %	0,56 %	35,19 %	-0,66 %	41,03 %
78	1,51 %	0,75 %	-3,34 %	-4,99 %	-7,78 %	-13,85 %
79	15,01 %	0,67 %	120,45 %	1,08 %	1,90 %	139,12 %
80	-1,43 %	-5,38 %	62,35 %	-26,72 %	-5,78 %	23,03 %
81	-0,67 %	-0,65 %	30,72 %	0,07 %	0,13 %	29,60 %
82	-1,58 %	-5,28 %	36,86 %	-0,09 %	-0,26 %	29,65 %
83	0,17 %	-4,80 %	-8,41 %	14,64 %	0,64 %	2,24 %

84	10,75 %	-10,78 %	-9,02 %	9,24 %	10,87 %	11,05 %
85	0,16 %	-1,47 %	-1,55 %	-0,23 %	-2,66 %	-5,74 %
86	-0,03 %	-0,09 %	0,37 %	0,08 %	0,00 %	0,33 %
87	0,89 %	0,64 %	0,29 %	0,46 %	0,11 %	2,38 %
88	0,48 %	14,48 %	1,23 %	0,55 %	-6,13 %	10,61 %
89	-3,89 %	-0,96 %	4,45 %	-0,70 %	1,50 %	0,40 %
90	-0,27 %	-0,52 %	-0,65 %	0,18 %	-0,11 %	-1,37 %
91	-0,13 %	-2,43 %	0,73 %	-0,08 %	-0,93 %	-2,84 %
92	-0,05 %	0,03 %	-0,02 %	0,04 %	0,01 %	0,02 %
93	-2,15 %	-0,16 %	11,84 %	0,31 %	-0,87 %	8,98 %
94	-0,72 %	-10,76 %	1,01 %	4,91 %	7,60 %	2,05 %
95	-0,14 %	-0,14 %	-0,72 %	0,69 %	-0,47 %	-0,78 %
96	1,20 %	-0,04 %	-0,58 %	-2,25 %	-0,43 %	-2,11 %
97	-0,69 %	-1,45 %	-0,24 %	0,76 %	-0,08 %	-1,71 %
98	-3,42 %	0,31 %	-4,09 %	-6,26 %	-2,22 %	-15,68 %

See section 5.4 for formula used to calculate abnormal returns

Source: Own calculation of abnormal returns based on data collected from Thomson Reuters Datastream (2012)

Appendix E

Table E.1: Variances of abnormal returns and cumulative abnormal returns for each of the stocks in the sample

Firm i	$\hat{\sigma}_{\varepsilon i}^{2}$	$\hat{\sigma}_{i}^{2}$
1	0,00027	0,00136
2	0,00031	0,00154
3	0,00131	0,00655
4	0,00024	0,00119
5	0,00058	0,00289
6	0,00103	0,00514
7	0,00094	0,00469
8	0,00056	0,00281
9	0,00046	0,00231
10	0,00045	0,00226
11	0,00028	0,00141
12	0,00044	0,00219
13	0,00080	0,00398
14	0,00147	0,00733
15	0,00033	0,00165
16	0,00026	0,00131
17	0,00154	0,00768
18	0,00016	0,00082
19	0,00041	0,00206
20	0,00045	0,00227
21	0,00067	0,00335
22	0,00306	0,01530
23	0,00027	0,00133
24	0,00112	0,00561
25	0,00074	0,00369
26	0,00133	0,00664
27	0,00091	0,00453
28	0,00141	0,00705
29	0,00040	0,00199
30	0,00005	0,00023
31	0,00047	0,00233
32	0,00044	0,00221
33	0,00052	0,00261
34	0,00026	0,00128
35	0,00010	0,00048
36	0,00061	0,00307
37	0,00060	0,00301
38	0,00259	0,01293
39	0,00061	0,00305

40	0,00045	0,00227
41	0,00328	0,01640
42	0,00162	0,00811
43	0,00250	0,01250
44	0,00047	0,00234
45	0,00174	0,00871
46	0,00180	0,00902
47	0,00033	0,00163
48	0,00048	0,00242
49	0,00074	0,00372
50	0,00024	0,00122
51	0,00283	0,01413
52	0,00142	0,00708
53	0,00074	0,00371
54	0,00142	0,00710
55	0,00109	0,00546
56	0,00297	0,01484
57	0,00135	0,00676
58	0,00403	0,02016
59	0,00166	0,00831
60	0,00101	0,00506
61	0,00145	0,00727
62	0,00037	0,00185
63	0,01407	0,07036
64	0,00010	0,00050
65	0,00393	0,01963
66	0,00101	0,00504
67	0,00175	0,00877
68	0,00319	0,01595
69	0,00137	0,00686
70	0,00046	0,00231
71	0,00307	0,01536
72	0,00077	0,00387
73	0,00095	0,00477
74	0,00374	0,01871
75	0,00074	0,00369
76	0,00051	0,00254
77	0,00250	0,01251
78	0,00243	0,01216
79	0,00405	0,02024
80	0,00391	0,01954
81	0,00050	0,00251
82	0,00117	0,00587
83	0,00559	0,02793
84	0,00076	0,00382
85	0,00043	0,00217

86	0,00097	0,00487
87	0,01602	0,08008
88	0,00385	0,01927
89	0,00240	0,01199
90	0,00027	0,00135
91	0,00040	0,00200
92	0,00042	0,00210
93	0,00064	0,00319
94	0,00112	0,00562
95	0,00684	0,03421
96	0,00040	0,00199
97	0,00064	0,00320
98	0,00117	0,00587

See section 5.4 for formulas used to calculate the variances

Source: Own calculation based on data collected from Thomson Reuters Datastream (2012)