Value creation through mergers and acquisitions

Empirical evidence from acquirers in a Nordic context

Master's thesis

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Abstract

In this thesis, we investigate whether acquiring companies within Denmark, Finland, Norway and Sweden create short-term shareholder value when announcing acquisitions. Firstly, we discuss what value creation is and how it should be measured. After comparing a multitude of income and value metrics, we conclude that abnormal returns are the relevant definition and measure. We next identify and test a series of deal, company and other economic drivers behind value creation. The seven drivers we investigate are: 1) the effects from companies with high cash flows; 2) acquisitions within merger waves; 3) the effect from previous multiple acquisitions within a short time span; 4) effects from the use of financial advisers; 5) cross-border acquisitions; 6) the effect from payment methods; and 7) strategic rationales and motives behind acquisitions.

We compile a unique dataset from several reputable data sources using a strict sampling procedure, resulting in a final sample of 627 acquisition announcements from 1995 to the beginning of 2018. The sample is analysed using two methods. Firstly, we use an event study as our primary method. In the event study, we observe and make corrections in the data to address problems related to e.g. thin trading and clustering. Namely, we employ trade-to-trade returns and introduce multiple test statistics. Secondly, we use regression analysis to check robustness and further analyse the aforementioned drivers.

Conclusively, we present significant evidence that Nordic acquirers create short-term shareholder value of 1.54% (cumulative average abnormal return in our main event period of interest). In relation to the drivers, we use our most significant results to present an M&A guideline, relevant for the industry and related professionals. In short, our results and interpretations suggest: 1) companies with excess cash and few investment opportunities to cautiously engage in acquisitions; 2) to generally employ financial advisers, but be selective in choosing between top-tier and non-top-tier advisers; 3) avoid equity settlement if bidder is highly valued; and 4) be cautious when announcing cost rationales, as these are negatively perceived by the market, and to further pursue diversifying acquisitions.

Contents

1 Introduction

The global market for mergers and acquisitions (M&A)[1] has recorded a high activity the last five years where Europe accounts for approximately 30% of the activity. However, the global M&A market has experienced a declining trend in 2017, compared to previous years where 2015 stands as the peak year in terms of deal value (Mergermarket, 2018). In contrast, the Nordic M&A market experienced its second most active year in 2017. The total deal value for the Nordic region in 2017 was almost doubled, compared to 2016 increasing from EUR 59 billion to EUR 103 billion. This development was mainly driven by transactions across Nordic countries representing 57% of total deal value. For that reason, the Nordic region accounted for 12.5% of the total European M&A activity, exceeding the activity in both France and Italy, underlining the region's essential representation on the European M&A market (Mergermarket, 2017). The 20-year historical Nordic M&A trend, measured in deal value, is illustrated below.

Figure 1. Quarterly deal activity in the Nordic region measured in deal value (EURbn) from 1998 to 2017.
Source: Own creation
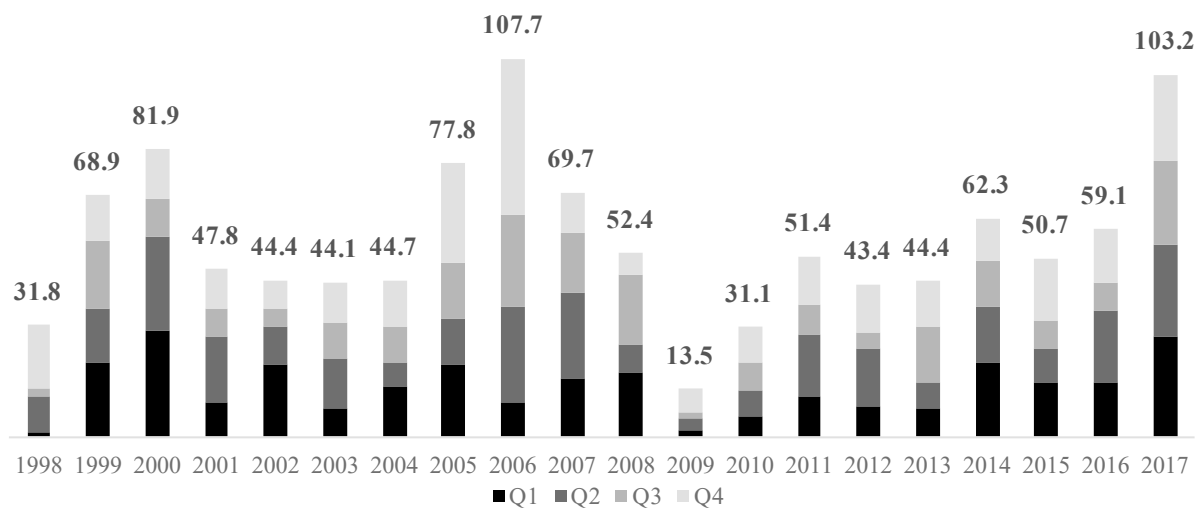
As indicated above, mergers and acquisitions are an essential part of the growth strategy discussion among corporates whether the rationales are concerning e.g. sales, cost or resource aspects. Furthermore, M&A activity has proven to be correlated with the stock market resulting in deal volume concentrating in waves (Sudarsanam, 2010). However, prior research regarding corporates engaging in M&A to create shareholder value is demonstrating that inorganic growth may in fact lead to destruction of shareholder value. In relation to principal agent theory, previous studies found entrenched managers to make value-destroying mergers and acquisitions, based on overpayment of targets and selection of low synergy targets leading to significant positive target returns compared to bidder returns (Harford, Humphery-Jenner, & Powell, 2012). In addition, managers tend to reduce payouts to shareholders, since internal

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[1] Throughout this thesis, we will not distinguish between the terms merger, acquisition and takeover, if not explicitly mentioned and likewise are the terms bidder, buyer and acquirer used interchangeably.
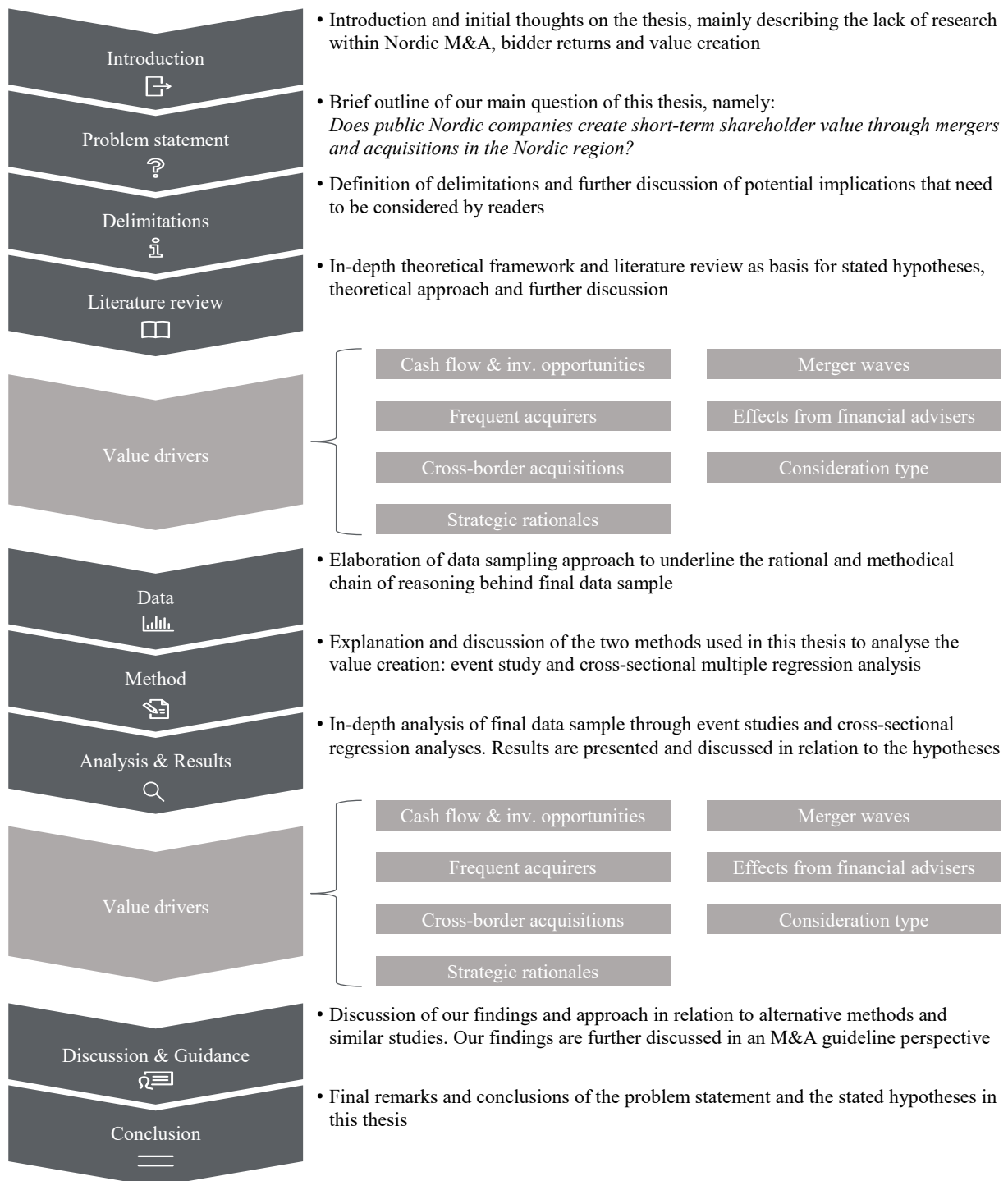
resources are related to their power. Thus, with a large amount of internal resources, managers are motivated to grow their companies beyond optimal size, as company growth are positively related to managers' power and compensation. Hence, managers are incentivised to make their companies grow quickly where M&A activities are essential (Jensen, 1986).

Conversely, many previous studies find abnormal bidder returns from M&A announcements to be, on average, statistically indistinguishable from zero, leading to a prominent contrast between target and bidder returns (Martynova & Renneboog, 2008). When examining relevant M&A studies over time, they reveal bidder abnormal returns to be highly dependent on bidder and deal characteristics such as consideration type, internal holding of cash flow, takeover strategy and acquisition type. In addition, prior work suggest diverse indications of whether bidder companies earn insignificant returns to their shareholders through merger waves over time (Martynova & Renneboog, 2008). More specifically, Eckbo (1985) found minor positive, but insignificant bidder returns during an analysis of American horizontal and vertical mergers. Walker (2000) examined 278 transactions by American firms and found that mergers on average led to a negative bidder return of -1.13% significant at a 5% level, but he also found takeovers to generate, on average, a positive, yet, insignificant bidder return of 0.51%. In a European context, Faccio, McConnell and Stolin (2006) analysed intra-European acquisitions from 1996 to 2001 and found significant and positive bidder returns of 1.48% for companies acquiring private targets. Lastly, in a British M&A perspective, Sudarsanam and Mahate (2003) found significant and negative bidder returns of -1.39%. Thus, we can conclude that research on M&A from an American and European context is abundant, but this is not the case within Nordic research on M&A. The few studies of Nordic M&A are mainly focused on Swedish deals, which is not surprising, as Sweden represents 42% of the total Nordic M&A market (Mergermarket, 2017). However, these studies are primarily analysing shareholder control, protection and ownership perspectives during Swedish mergers and takeovers (Doukas, Holmen, & Travlos, 2002; Holmen & Knopf, 2004).

Referencing to the section above, we conclude that there has been conducted several research studies within M&A in general. However, these are primarily focused on America, Continental Europe or United Kingdom, while similar research is limited in the Nordic region. Nevertheless, the Nordic M&A activity has never been this high (since 2006) (Mergermarket, 2017), underlining the essentiality of the region in the European M&A market. Because of these two contrary tendencies, we find it highly relevant to further examine the Nordic M&A market and the underlying value creating drivers. As the M&A activity has significantly increased during the years, we also find it central to investigate the Nordic bidder returns from M&A announcements, as previous studies across the globe have been ambiguous and not instructive in a Nordic context. These factors comprise the main motivation behind this paper. To give a transparent overview of the thesis, we illustrate the overall structure in a graphical summary below.

Figure 2. Overview of thesis structure

Source: Own creation

Introduction

- Introduction and initial thoughts on the thesis, mainly describing the lack of research within Nordic M&A, bidder returns and value creation

Problem statement

- Brief outline of our main question of this thesis, namely:
Does public Nordic companies create short-term shareholder value through mergers and acquisitions in the Nordic region?

Delimitations

- Definition of delimitations and further discussion of potential implications that need to be considered by readers

Literature review

- In-depth theoretical framework and literature review as basis for stated hypotheses, theoretical approach and further discussion

Value drivers

Cash flow & inv. opportunities	Merger waves
Frequent acquirers	Effects from financial advisers
Cross-border acquisitions	Consideration type
Strategic rationales	

Data

- Elaboration of data sampling approach to underline the rational and methodical chain of reasoning behind final data sample

Method

- Explanation and discussion of the two methods used in this thesis to analyse the value creation: event study and cross-sectional multiple regression analysis

Analysis & Results

- In-depth analysis of final data sample through event studies and cross-sectional regression analyses. Results are presented and discussed in relation to the hypotheses

Value drivers

Cash flow & inv. opportunities	Merger waves
Frequent acquirers	Effects from financial advisers
Cross-border acquisitions	Consideration type
Strategic rationales	

Discussion & Guidance

- Discussion of our findings and approach in relation to alternative methods and similar studies. Our findings are further discussed in an M&A guideline perspective

Conclusion

- Final remarks and conclusions of the problem statement and the stated hypotheses in this thesis

1.1 Problem statement

This thesis seeks to investigate the M&A market in the Nordic region, which has significantly increased in activity through the years to all time high (since 2006). More specifically, we want to examine the research gap of determining the potential value creation in the Nordic region. Thus, we state the following problem statement below, which is the centre of attention in the paper:

Does public Nordic companies create short-term shareholder value
through mergers and acquisitions in the Nordic region?

To further support and guide the research related to the statement above, we formulate a set of research questions to be answered in this thesis:

- What is value creation and how should it be measured?
- How does the selected theories and deal, company and other economic characteristics presented in this thesis influence the value creation?
- How are the results presented in this thesis relatable to M&A practice and what are the potential implications?

1.2 Delimitations

Throughout this paper, the research is naturally constrained by some delimitations to ensure a focused study resulting in a comprehensive conclusion related to our problem statement. These delimitations will be discussed below.

Firstly, as pointed out in the problem state and indicated in the introduction, this paper geographically focuses on the Nordic region, i.e. Denmark, Finland, Norway and Sweden. More specifically, deals consisting of bidders and targets both based in one of these four Nordic countries are included in the data sampling and analysis. This geographical delimitation is primarily due to the very limited research within this area compared to well-known American or European M&A studies. Furthermore, we find the available data of mergers and acquisitions in the Nordic countries to be statistically sufficient to perform an in-depth research paper within this area.

Secondly, this paper focuses solely on value related to shareholders of the bidder company. Research widely agrees that total combined value gains to both targets and bidders are positive where several studies have found significantly evidence that target shareholders gain value considerably above zero (D. K. Datta, Pinches, & Narayanan, 1992; Goergen & Renneboog, 2004; Jensen & Ruback, 1983). However, value distributed to target shareholders significantly exceeds the value distributed to bidder shareholders, where the last-mentioned is, on average, statistically indistinguishable from zero

(Martynova & Renneboog, 2008). On that note, we find it more relevant to examine the potential value creation distributed to bidder shareholders, since results in this research area are more diverse.

Thirdly, it should be emphasised that results from the analysis, i.e. event study and cross-sectional multiple regressions, are delimitated to a public perspective as all bidder companies in the data sample are publicly listed companies. This is primarily due to data availability requirements (e.g. share prices) related to the methodical framework throughout this thesis.

Fourthly, when examining the value creation, we only consider short-term value. While long-term value for bidder shareholders is just as important, if not more, previous studies have underlined the difficulties of measuring long-term value complicating the process of suggesting valid conclusions. If the event window is broadened to include several weeks, months or even years after announcement, share price reactions to M&A statements are highly depended on the methodology of estimating value creation. Studies measuring value, based on the market model over a three year period, have found significant and negative abnormal returns, whereas studies using the CAPM model or market-adjusted model led to inconsistent long-term abnormal returns (Martynova & Renneboog, 2008). Alternatively, bidder returns could be measured through a portfolio of companies with size and market-to-book ratio as common factors, proven by Barber and Lyon (1997). Studies applying this method have suggested insignificant abnormal returns on a long-term basis. In conclusion, the measurement of value creation is delimitated to a short-term period, as this ensures a sufficient validity of the thesis results.

Fifthly, for the test statistics used in the event study results, we refrain from showing and explaining all the involved calculation steps and in-depth derivations, as we see them as, in some cases, far outside the scope and not relevant for the purpose of this thesis. Instead, we turn our focus on the interpretation, assumptions, strengths and weaknesses concerning how they can be used in the analysis of the value creation. Hence, this approach makes sure that focus on the economic and financial aspect is kept throughout the analyses. We provide references to all relevant literature regarding the calculation of tests in the method section 2.2.7.

Sixthly and related to the previous delimitation, in the regression analyses conducted in this thesis, we will not concern ourselves too much with the underlying assumptions of this method and associated tests. While we of course acknowledge the importance of these assumptions and cannot rule out the possibility that one or few of the classic OLS assumptions are not being fulfilled, we proceed with the analysis presuming that assumptions are met. Since we intend to follow the procedures of previous published research, we see this approach to be a relatively non-relevant issue in this paper, as regression analysis is so widely applied and, again, the statistical methods and assumptions are not the main objectives of this thesis.

Lastly, we will not use heteroscedastic robust standard errors in the event study as this complicates things further than what we believe is appropriate for solid inferencing of the results. However, we make

use of robust errors in the following regression analyses to correct for potentially biased standard errors, which could lead to invalid suggestions related to the coefficients' significance.

1.3 Theoretical framework and literature review

1.3.1 Wealth measurement and value creation in firms

This paper is centralised on M&A activity and wealth creation among firms in the Nordic economies, but why do firms exist? Coase (1937) answers this question through his study opposing Smith's theory (1904) of the invisible hand, a metaphor of the price signals that control the economy. Firms are the reaction to the high costs of using markets. Instead of negotiating and enforcing separate contracts for each individual, firms are reducing the overall transaction costs (Coase, 1937). In other words, firms may be seen as a compilation of contracts relating to several factors such as employees, operations, ownerships and resources. Later, the stakeholder and shareholder theories were proposed, and they are today the most popular corporate governance theories, which define "the system by which companies are directed and controlled" (Cadbury, 1992). Friedman (1970) was the first to propose the shareholder theory, which states that the only purpose companies have, is to increase profits and thereby create shareholder value. This is uphold by management who is legally and morally obliged to fulfil this purpose, based on the principal agent relationship, as management (agents) is hired to run the company owned by the shareholders (principals/owners) (Hendrikse, 2003).

Later, the stakeholder theory was introduced as a response to the shareholder theory, as the last-mentioned focuses only on the financial aspects of running a company. Freeman and Reed (1983) stated that a company owes responsibilities to other interested parties beside shareholders. They define stakeholders as interested parties affected by the actions made by a company, i.e. customers, employees, interest groups or even communities in general.

Doing business solely from a shareholder theory perspective has some shortcomings, as this approach may lead to incentives among management to take greater risks and focus on short-term strategies, since the interest of shareholders is the sole determination. Nevertheless, this thesis takes a shareholder value perspective in analysing the value creation through mergers and acquisitions in the Nordic countries.

Before further analysis of the countries and acquisitions is conducted, a solid understanding, of what value and value creation are, has to be established. We seek to do so with the following discussion of some of the typical value measurement metrics used widely in the literature, all primarily related to the shareholder view on companies and value creation. Thus, we try to create a value framework in which the results of prior research are aligned within and the results of this paper are based upon.

As mentioned above, a pure shareholder view on value creation does not come without worries. This is clearly evident in the multitude of financial crises observed through time, from the Great Depression in the 1930s till the dot-com bubble in the early 2000s and the recent financial crisis of 2007 to 2009.

Much can be learned from these recessions, notably that (short-term) shareholder interests often have higher priority than stakeholders' interests do and thus possibly at the cost of these. However, a shareholder perspective on value creation is not the primary concern among some authors – short-termism is – and the latter is the primary reason for shareholder value destruction in for example financial crises (Koller, Goedhart, & Wessels, 2015).

Defining shareholder value is not as easy as it may sound. A vast selection of both practitioners and academic theorists have tried to come up with a clear definition of what value is and how to measure it. While some are easy and intuitive to understand and measure, none is free of disadvantages in one or several applications. As a ground rule, it should be clear that a good measure of shareholder value is one that aligns the interests of management and shareholders, e.g. eliminating or at least minimising principal-agency issues.

Accounting measures (or book values) of firm value are widely used in both practical and academic regards. Analysts use historical accounting measures of the firm's profitability and financial position to forecast the future performance of the company. Banks and other stakeholders use book measures in determining for example credit-servicing capabilities of the firm or the profit level and thus taxable income, if the stakeholder is governmental in nature. Academics rely on accounting measures in teaching and research to explain the actions performed by the company and its management. Firms themselves also use book measures, for example in relation to executive compensation plans. A firm's board might design a bonus plan on the earnings per share (EPS) level of the firm, and although it is not directly a measure of company value, a link to the book value of shareholders equity is present, as retained earnings make up a sub-part of this metric. Thus, when EPS increases, so should the book value of equity and the wealth of the shareholders (not considering payout policies). This is however not always the case as documented by Petersen and Plenborg (2012). Several issues persist when relying on accounting measures like EPS, including transitory accounting items, changes in accounting policies and changes in accounting estimates (e.g. the lifetime of assets and thus depreciation levels or the number of shares outstanding) and the fact that accounting measures are backward looking. Management has some flexibility in accounting and is consequently able to influence EPS and other accounting measures, thus not necessarily striving to achieve the long-term interest of shareholders. Investors failing to recognise the true drivers of changes in EPS might buy or sell shares in the company on an uninformed belief, thus pushing prices away from equilibrium and consequently creating or destroying value. This in turn, creates evidence in favour of some version of the Efficient Market Hypothesis (EMH), which we will return to later. The disadvantage of accounting measures is indeed recognised by other authors as well (e.g. Koller et al. (2015)), and the fact that long-term strategic objectives should create more shareholder value is thus to some degree proven correct.

A general unanimity is that the value of a company is the present value of the future cash flows to the firm (free cash flow or FCF). Thus, if we are able to measure the FCF of a company, we can determine the true (intrinsic or fair) value of a company and its equity (the shareholders claim on the company). However, as stated above, the present value of a company is a discounted value of the *future* cash flows to the company and this of course poses several problems. Firstly, since future cash flows are not known with certainty today, the use of a cash flow-based measure might over or underestimate the true value of the company. Management, shareholders and external analysts might try to evaluate company value based on a discounted FCF analysis, but uncertainty will persist and thus it is the estimate of true company or equity value biased in either direction. Secondly, while not being an accrual-based measure but a cash-based measure, management still has some flexibility and is therefore able to somewhat influence the cash flowing in and out of the company. As with the problem of EPS, management might postpone investments (organic or acquisitive) and thus increase short-term net cash flows to the company. Therefore, when cash flows are discounted and future cash is worth more today than tomorrow, the value of the firm increases. Consequently, management may create short-term shareholder value, but possibly at the cost of long-term value creation, as projects with positive net present values disappear and sustainable competitive advantages fade or are lost completely. Thus, while being theoretically a true measure of a company or equity's value, the metric still has downfalls.

Another measure of value creation is Economic Value Added (EVA) or economic profit. While it can be shown that EVA is theoretically identical to the cash flow measure (Koller et al., 2015; Petersen & Plenborg, 2012), EVA has other distinctive properties, making it somewhat more ideal for the measurement of value creation. The basic notion behind EVA, as popularised by Stern Stewart & Co., is that for a firm to create additional shareholder value, it has to earn a profit above its cost of capital, i.e. the return on invested capital (ROIC) has to be larger than the weighted average of both the shareholders' and debtholders' return requirements (WACC). Thus, management can create value by increasing ROIC or by lowering WACC. This is very similar to the principle behind the FCF approach, but what makes EVA stand apart and be quite compelling for value measurement is that EVA shows how much value is created in each period (yearly, monthly or other period), which the FCF approach cannot equally do. By multiplying the difference between return and cost of capital in year t with the firm's invested capital (sum of book values of equity and debt) at year-end $t-1$, one can derive the value added to the firm in year t:

$$(ROIC_t - WACC_t) * Invested\ Capital_{t-1} = EVA_t \qquad (1.1)$$

This formula reveals another interesting feature, namely the amount of value added to a firm in excess of its book value. On the other hand, this value can be used to create another measure of a firm's value, namely market value added (MVA), which is the present value of all future EVAs, and which "luckily"

is equal to the net present value of all future cash flows, when the book value of invested capital is summed with the MVA.

When comparing the two measures, some interesting facts and views on shareholder value creation are revealed. While the discounting of future cash flows might be a more tangible concept ("a dollar today is worth more than it is tomorrow"), it does have a major flaw, when the purpose of one's analysis is to investigate sources of value creation. EVA in turn does this better, as EVA can be seen as a "… surrogate for or the predictor of future share price performance…" (Petersen & Plenborg, 2012, p. 312). Thus, EVA has a more direct link to the value creation than FCF has, which is probably why this measure often is used in management bonus plans to align principal and agent interests.

Yet, despite the above claim that EVA is a direct link from value creation in firms to share price performance, and the fact that EVA indeed has a strong theoretical appeal, empirical studies have shown that EVA might not be the best at predicting share price performance. Biddle, Bowen and Wallace (1997) show that accrual earnings actually do a better job than EVA in explaining share price returns.

In the context of analysing and measuring performance and value creation from mergers and acquisitions, the use of accrual measures like EPS, does not seem like the appropriate choice, as one cannot easily determine the exact link between earnings and value changes, which is possible with EVA. While EVA in theory could be used to value the gains from mergers and acquisitions, this would include many estimations to be made on both the buyer and target side. However, as stated above, the aggregate value of all future EVAs equals total market value added. Adding the book value of invested capital to MVA equals the enterprise value of a firm, which in turn can be turned into the (intrinsic) equity value of a firm by deducting net debt. This is interesting, because if markets are efficient, it should be possible to determine the value creation in public companies by observing changes in the share price qua the link to EVA and MVA. The assumption of efficient markets (the Efficient Market Hypothesis) is central to this thesis and will consequently be discussed more in the following sections of this paper.

Having established the possibility to measure value creation from share price movements, a good metric for this value has to be determined. Koller et al. (2015) propose to use what they term *total returns to shareholders* (TRS). TRS is simply a measure of the change in share price from one point in time to another, including dividends paid in the period, expressed as a percentage. The metric has several properties making it suitable in a variety of applications. TRS is decomposable into smaller pieces allowing management and shareholders to analyse the sources of share price changes. This is important, as the only true value creation, and thus shareholder wealth gains, can come from improvements in operational metrics (e.g. revenue growth and margins). Changes in price-to-earnings ratios (P/E) also affect TRS, but a change in P/E is not necessarily coherent with true value creation. Another problem with the use of "plain" TRS is that some firms might have experienced high TRS in the past and later

struggle to deliver the same level of TRS and thus outperform the market as previously – a phenomenon known as the *expectations treadmill* (Koller et al., 2015). Besides having the effect of making management's life harder in explaining and convincing shareholders that the firm is performing well despite lower TRS, it also affects the potential to perform benchmarking across time and/or companies. Consequently, a more benchmarking robust metric has to be employed, and a commonly used alternative is *abnormal returns* (AR) or *cumulative abnormal returns* (CAR).

Generally, the measurement of AR and TRS is identical in that they both use share price changes to measure value creation. What makes AR a more suited metric for value creation, however, is the fact that this metric makes an adjustment to plain TRS, namely adjusting for "normal" or "market" performance, which leaves only the "extraordinary" effects of say an acquisition announcement or a stock split. This risk-adjusted return is thus the real value creation (Fama, Fisher, Jensen, & Roll, 1969; Keef & Roush, 2002). The abnormal return is defined as:

$$AR_{it} = R_{it} - E(R_{it}) \tag{1.2}$$

where R_{it} is the actual return of stock i at time t, and $E(R_{it})$ corresponds to the expected return of stock i at time t, typically estimated by the market model:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \tag{1.3}$$

in which β_{it} adjusts for the market exposure of the stock and ϵ_{it} is an error term with $E(\epsilon_{it}) = 0$ and $var(\epsilon_{it}) = \sigma^2_{\epsilon_t}$ (MacKinlay, 1997). The expected return derived from the market model can in fact be interpreted as an opportunity cost of the investor in the sense that the investor may choose to invest in the market instead of the stock. This implies that the return above the market-adjusted return is the true value created in the firm. The assumptions behind abnormal returns are multiple with the main one being the EMH (Keef & Roush, 2002). This is important to remember, as both the return on the stock itself and the return on the market must reflect investor expectations efficiently to be used as a solid measure of wealth creation.

In the remainder of this thesis, we acknowledge abnormal returns as the way to define and measure true value creation correctly in line with most studies focused on the value creation in firms.

1.3.2 Cash flow and investment opportunities

Agency theory has become a considerable term in the economic world proved by several studies of conflicting interests between managers (agents) and shareholders (principals/owners). These conflicts may lead to poor decisions in terms of corporate financing, operations and company growth. Jensen (1986) emphasises that managers see financial resources as an important source of power, which results in a payout policy that is not favouring the shareholders. If the internal financial resources are considerable, and management sees a certain motivational/personal value of controlling large

corporations, it would often lead to the beginning of empire building (Jensen, 1986). When external financing is not necessary, managers are meeting less requirements when acquiring other companies, leading to acquisitions where the need is questionable.

In addition, company growth increases management's power, as the pool of resources often is correlated with growth, creating incentives for managers to make the company grow beyond the ideal size. Growth is also related to management's compensation. Murphy (1985) outlines the correlation between the growth in company sales and the change in management's compensation. This leads to a strong motivation among managers to boost sales through inorganic growth, especially if the available FCF (excess cash flow after investing in all projects with positive NPVs) is substantial. As the result of Jensen's study (1986), he states a hypothesis: when management has a large amount of free cash flow at its disposal, management tends to invest in projects with negative NPVs rather than paying out excess cash to shareholders.

Lang, Stulz and Walkling (1991) test Jensen's hypothesis on a sample consisting of large company investments involving acquisitions of controlling stakes in other companies by making successful tender offers. They use Tobin's Q defined as the ratio between the market value of the companies' assets and their replacement costs. Tobin's Q is used as a benchmark to distinguish between companies that have respectively negative and positive investment opportunities available with current management (Lang et al., 1991). The study concludes that bidder returns decrease as cash flow increases in companies with low Qs, but this is not the case for companies with high Qs. Furthermore, they found that takeover announcements by companies with high FCFs and low Qs have a negative effect on shareholders' wealth. The underlying reason is either: 1) the acquisition price indicates synergies available only for competing companies; or 2) the acquisition displays undesirable information about bidder's investment opportunities or management (Lang et al., 1991). Finally, Harford (1999) estimates firms' actual cash reserves compared to required cash reserves. Corresponding to Jensen's hypothesis (1986), the study found that cash-rich companies are more likely to make acquisitions compared to other companies, and these acquisitions are value decreasing. These studies highlight the interesting characteristics of bidder's cash flow before making an acquisition and the often associated agency issues.

Based on the above theory section and empirical findings, we state two hypotheses to be tested within this area of the thesis:

H₁: *High bidder cash flow will affect bidder abnormal returns negatively*

Since Lang et al. (1991) found evidence on the effect of bidder's investment opportunities together with bidder cash flow, we also state the following hypothesis:

H₂: *High bidder cash flow and low investment opportunities will affect bidder abnormal returns negatively*

1.3.3   Merger waves

Several companies make mergers or acquisitions to achieve growth. The rationales are very different and span from the need of critical resources to achieving competitive synergies, which should lead to an increase in shareholder value. Studies through the years show a trend where the M&A activity among corporates seems to be centralised in peak periods. The term for this is *merger waves*. There have been five waves since the beginning of the 20th century based on American studies (Sudarsanam, 2010): 1) the horizontal/monopoly wave from 1890 to 1904; 2) the oligopoly wave from 1910s to 1929; 3) the conglomerate wave from 1955 to 1975; 4) the divesting/specialisation wave from 1984 to 1989; and 5) the technological wave from 1993 to 2000. These merger waves describe the development in the past M&A market. According to Sudarsanam (2010), the first three waves began when an economic boom occurred together with an increasing stock market. The last two waves also coincided with good economic times, but they were also heavily affected by anti-trust laws (fourth wave) and technological innovations (fifth wave) (Jovanovic & Rousseau, 2002). Furthermore, the ending of the five merger waves can be explained by the economic recessions and stock market crashes that occurred consistently at the end of each wave period.

Sudarsanam (2010) claims that M&A activity is correlated with the trend in the stock market. Consequently, merger waves are appearing when the stock market is trading at a high level, and acquiring companies are taking advantage of their current high valuations to acquire companies that are relatively undervalued. There are several studies explaining the trend of merger waves. Sudarsanam (2010) highlights two types of theories that recur through all the different studies: the neoclassical theory and the behavioural theory.

Gort (1969) explains the neoclassical theory through his study about economic disturbance theory, which illustrates the outcome when there happens to be a difference between the shareholders' and the market's valuation of company assets. The key factors behind these differences are the risk and expectation of future income generation associated with these assets activated by industry shocks. M&A opportunities appear when: 1) buyer's value estimate of target's assets is valued higher than the estimate made by the shareholders of target; and 2) buyer's investor surplus for the particular assets (difference between own value estimate of assets vs market price) is higher than its investor surplus for every other asset (Gort, 1969).

Andrade, Mitchell and Stafford (2001) further explain merger waves through the neoclassical theory, based on the US merger activity in the 1990s. They also state that a significant share of merger waves can be explained by industry-level shocks, where an example of these are technological innovations creating consolidation in the industry due to the subsequent excess capacity (fifth merger wave). Another example is supply shocks, such as oil prices and deregulation (Andrade et al., 2001). These shake-ups

in the industry trigger the considerable relocations of resources among companies, which scatter to other industries and the whole economy.

The behavioural theory is related to the neoclassical theory, but also includes additional evidence that is not considered in the neoclassical theory, such as merger waves that are not triggered by industry shocks and whether bidder uses stock or cash payments in the acquisition of target. Shleifer and Vishny (2003) propose a (behavioural) theory, where acquisitions are driven by stock market valuations of the merging companies. The main assumption behind the theory is that the market is inefficient leading to inaccurate valuations of companies. In addition, agents (managers) are assumed to be rational, to fully understand the market inefficiency and to take advantage of this in M&A discussions. The model composed by Shleifer and Vishny (2003) shows, when overvalued stock markets are a reality, management decides to acquire other companies through stock tender offers exchanging overvalued stocks for real assets based on past assumptions. Even though management knows that this announcement will have a negative impact on the company share price, they are still representing shareholders' long-term interests, as the share price decreases when the economy faces recession. As a result, this outlines a clear incentive for companies to get their equity overvalued (Shleifer & Vishny, 2003).

Rhodes-Kropf and Viswanathan (2004) acknowledge the study performed by Shleifer and Vishny (2003), but they question managers' understanding of the market inefficiency. Hence, they compose a new model, which assumes asymmetric information in the market and therefore agents will not know other companies' values except for their own. In this study, they also assume potential synergies meaning that M&A can be a way to create value for shareholders. In overvalued stock markets, targets may find it difficult to determine whether the level of a stock tender offer is based on potential synergies or just a current bull market. This leads to generous valuation estimates of synergy effects increasing the offered target price. Rhodes-Kropf and Viswanathan (2004) conclude the study by outlining that target companies generally accept acquisition offers in periods with overvalued stock markets.

Lastly, Xu (2017) found significant evidence that late movers in merger waves achieved a greater bidder return compared to first movers in merger waves. Xu (2017) relate the findings to the learning from peers' behaviour where late movers may have achieved knowledge and capabilities to perform effective transactions.

From the above findings and theoretical perspectives of especially Rhodes-Kropf and Viswanathan (2004) on generous valuations during merger waves, we state one hypothesis to be tested in this thesis:

H$_3$: *Acquisitions within merger waves will lead to lower abnormal returns compared to acquisitions outside merger waves*

1.3.4 Frequent acquirers and acquisition experience

It is well-documented that success in acquiring and integrating firms varies greatly between firms and industries and that some firms are exceptional acquirers while other companies trail the successful ones on this matter. Some companies operate in industries that have reached a somewhat maturity point where solid and continuous organic growth is hard to accomplish, thus often leaving acquisitive growth as the go-to value creation path to satisfy shareholder expectations. Although not limited to, many companies (often large in terms of relative market cap and/or asset value) in these industries start consolidating and make multiple or "series" of acquisitions, which might be within a shorter period. These companies are often denoted "frequent" or "serial" acquirers (used interchangeably hereafter).

Basic organisational learning theory tells us that companies which frequently do M&As should be better at post-merger-integration, i.e. better at utilising potential synergies and thus create more value. This should in theory be true, as serial acquirers have progressed further along the learning curve (or at least should have) by sharing experience and knowledge within the organisation from those earlier acquisitions (Hayward, 2002; Hitt, Harrison, Ireland, & Best, 1993; Rovit, Harding, & Lemire, 2003). This is known as the Organisational Learning Hypothesis.

Contrary to the above is the potential entrance of value destroying factors, such as hubris in management actions – the Hubris Hypothesis. Managers may become overconfident, overestimate potential synergies or overbid other contestants and then fall short to the winners curse. They might start to build empires or pursue other personal interests and thus commence on a value-destroying path through additional acquisitions instead of a value-creating one; in short, principal-agent problems arise and agency costs are introduced/increased.

Prior research on the subject of frequent acquirers presents somewhat mixed results. One article, citing research done at Cass Business School, found evidence that on average, companies that undertook two or more acquisitions within the 30-month study period outperformed the market by 7.8%, while those companies that did one deal outperformed the market by 4.5%. On the explanation of the matter, they state: "Experienced acquirers, doing regular deals, are able to build up internal expertise and learn from the deal process. This access to deep capabilities and experience is invaluable in successfully integrating acquisitions." (Towers Watson, 2011).

Ismail and Abdallah (2013) surveyed a sample of 6,503 UK acquisitions made between 1985 and 2004, studying the CARs around the acquisition announcement when controlling for previous deal similarities. In general, they find that multiple acquirers do not generate additional CARs (although still positive) in subsequent acquisitions, which is in line with previous research. Instead, when multiple acquisitions are carried out, CARs decrease significantly with the number of previous acquisitions. However, when controlling for the method of payment of the acquirer, a more stable pattern is evident in cash-only deals. In a multivariate test, they show that acquirers' returns do not increase with prior

experience, but they do find evidence on the fact that serial acquirers structure deals in accordance with previous ones (e.g. same method of settlement), and thus some form of the learning hypothesis is evident.

Fuller, Netter and Stegemoller (2002) investigate the abnormal returns to shareholders in companies completing five or more acquisitions within a three-year period prior to a given acquisition announcement. They study the period from 1990 to 2000 using US data, as they argue that takeover activity during this period were relatively high by historical standards and finally, their sample consists of 539 unique acquirers making 3,135 deals in the period. They show that the CAR from an acquisition is generally dependent on the company status of the target (i.e. public, private or subsidiary), and conclude that bidder shareholders generally gain when their company acquires private companies or subsidiaries of public firms, but lose when the target itself is public (all statistical significant results). They make no direct comparisons to non-frequent acquirers, but show via an event study and subsequent regression analysis, that later acquisitions within the three-year period are correlated with lower CARs in general.

Hayward (2002) studies acquisitions in the US from 1985 to 1995 using a sample of 100 listed companies and all their publicly disclosed acquisitions in the period, including both foreign and domestic acquisitions and in several industries. His sampling yields a dataset of 535 deals, divided into a non-focal (1985 to 1989) and a focal (1990 to 1995) group, which he uses to describe and predict the experience and performance of frequent acquirers. He uses the number of previous acquisitions made from the non-focal period until the focal deal as a measure of experience and further controls for similarity between focal and non-focal deals. Measurement of similarity is a percentage of how many of the acquisitions that were in related industries, based on the most common SIC code. Contrary to the learning hypothesis, Hayward finds that greater acquisition experience and announcement returns are negatively correlated and thus, he finds no evidence in favour of the learning hypothesis, based on an "amount" factor. However, the similarity measure proved to be highly significant and to increase the announcement return as expected. In addition, some of the control variables were highly significant, including method of payment.

Many determinants of serial acquirer value destruction are linked to hubris, winners curse and Jensen's theory of FCF as mentioned above. Roll (1986) is one of the most significant papers written on hubris in corporate takeovers. He states that firms (decision-makers) infected by hubris generally pay too much in acquisitions and conduct acquisitions that should not be completed (the firm's management fall short to the winners curse, which thus leads to value destruction). His conclusions are highly debated and both evidence in favour (Hietala, Kaplan, & Robinson, 2003; Malmendier & Tate, 2008) and against (Boone & Mulherin, 2008) his findings are readily available.

Based on the above theoretical examination and literature review, we construct the following hypotheses:

> **H₄**: *Acquirers which frequently engage in acquisitions should experience higher abnormal returns, based on the learning hypothesis*

In addition, we believe that acquiring companies, which have a high fraction of acquisitions within the Nordics, should experience higher CARs than those, which primarily engage in acquisitions outside of the Nordic countries. Thus, we have formulated the following hypothesis to be tested:

> **H₅**: *Acquiring companies, which have a high fraction of acquisitions within the Nordics, should experience higher abnormal returns than those, which do not*

Lastly, as the literature review suggests, companies tend to structure deals in the same way as their previous deals, and thus, based on the learning hypothesis, we believe that:

> **H₆**: *Acquirers with a high degree of similarity between deals (e.g. method of payment and relatedness in terms of industry) experience higher abnormal returns*

1.3.5 Effects from choice of financial adviser

Financial advisers are just one out of many sources of external advice and consultation that firms use, and almost all companies employ accountants, lawyers, management consultants, etc. at some point in their lifetime and/or day-to-day operations. The choice of hiring a financial adviser (or investment banker, used interchangeably hereafter) when engaging in mergers and acquisition is a quite common choice across all levels of financial transactions, although the decision to hire, and the usefulness of these advisers are often sources of debate, compared to for example lawyers and accountants. This is not surprising. Investment bankers often require huge fees for their services, the outcome of their work is sometimes hard to see, and can be hard to justify as the output of their work is often very intangible (i.e., the value added by financial advisers are disputable).

If financial advisers only occasionally add value, why are they so widely used? According to Sudarsanam (2010), investment bankers are hired for numerous reasons. Hiring companies might not possess the required expertise or fulfil regulatory requirements to complete the transaction themselves. In addition, advisers are probably also hired in the belief that they will create more value for the company, as they can employ resources more efficiently, based on for example experience and knowledge from the M&A industry. When investment banks however fail to create additional value for their clients (which is not necessarily equal to destroying value), this is often attributed to numerous factors, including conflicts of interest, investment banks acting in their own interest (incentive problems), consumption of the surplus they create and other principal-agency problems.

In a much cited study by McLaughlin (1990), he examines the contracts between clients and investment banks in tender offers and the fees paid to these banks. He finds that fees paid to financial advisers mostly are contingent on the outcome of the deal, and while some contracts are successful in meeting client objectives, others create conflicts of interest. These conflicts are especially visible in offer evaluations, hostile offers and the price to be paid by acquiring firms, he states. As an example on share-based consideration deals, advisers may tell clients to increase the bid on target firm's shares and thus maximise the probability of deal completion without any regards to maximising the expected value surplus to bidder shareholders. Thus, bidders may not see increased CARs in these poorly designed contracts. In a concluding remark he states: "Since there are few independent checks to use in evaluating such advice, and since mistakes take so long to manifest themselves, these contract incentives potentially accentuate the problem of the winner's curse." (McLaughlin, 1990, p. 230).

Overall, the literature and prior research on the use of financial advisers are quite extensive. It is, however, mostly based on findings in the US and the UK or on a global basis, and the results are, to say the least, mixed.

Servaes and Zenner (1996) examine the overall decision of using and not using an investment bank, based on a sample of 99 acquisitions completed with in-house (internal) advice and another sample of 198 transactions completed with investment banking advice from 1981 to 1992 (all advisers to bidder/acquirer). They find that the choice of using an investment banker is based on transaction costs, contracting costs and asymmetric information. In addition, firms use investment banks when transactions are complex and when the firm is an inexperienced acquirer. They find that when using an investment bank, acquirer CARs are significantly negative, but not after controlling for determinants of the investment bank choice.

While not completely identical to the transactions in the M&A industry, Fang (2005) investigates the relationship between adviser (or underwriter) reputation and price/quality in the bond underwriting services industry. As she notes, both investment banks and their clients operate in the financial market, but investment banks are *repeated players* while their clients (or ordinary issuers) may not be and thus only occasionally issue capital to investors. Hence, she states that investment banks' profits and survival are more directly related to the reputation they have in the market. She sampled more than 3,000 bond issues in the US between 1991 and 2000, with 51 investment banks represented in the sample. She further shows that top five banks, based on the market share, underwrite more than 60% of all deals and the 15 largest ones underwrite 95%. When controlling for endogeneity in the relationship between issuer and investment banker choice, she finds evidence that high-reputation investment banks (defined according to market share in the underwriting market) create lower yields (higher bond prices). Interpreting low yields as high quality, she concludes that high-reputation underwriters provide higher quality underwriting services.

Golubov, Petmezas and Travlos (2012) try to identify whether top-tier advisers, based on their reputation, create more value for their clients than non-top-tier advisers. They allocate advisers based on the value of their previous completed transactions. Using a sample of 4,803 US transactions (bidders are public companies and targets can be public, private or subsidiary) from 1996 to 2009, they find that in general, the employment of top-tier advisers does not generate additional CAR to the bidder. However, when the target company is public, they do find the increase in CAR of 1.53% to be highly significant. This finding is supported by Rau (2000), who studies the gains in tender offers. Golubov et al. (2012) accredit this improvement to two factors: 1) the "better-merger" hypothesis – top-tier advisers are better at structuring mergers with higher synergies; and 2) the "skilled-negotiation" hypothesis – top-tier advisers are better at accruing synergies to the bidder firm. The latter also find evidence for these hypotheses.

Based on the above theoretical summary and empirical findings, we construct three hypotheses to be tested within this area of the thesis:

H_7: *Bidders using financial advisers in acquisitions experience higher abnormal returns than those, which do not*

Since earlier empirical findings document that investment bank reputation matters, we further test the following:

H_8: *Bidders using top-tier financial advisers in acquisitions experience higher abnormal returns than those, which employ non-top-tier financial advisers*

Finally, since this thesis has a Nordic focus, we further investigate whether Nordic-based financial advisers create more value than non-Nordic advisers do, since the former generally could have a better understanding of the local market and a tighter relationship with their Nordic clients:

H_9: *Bidders using advice from Nordic-based (top-tier) financial advisers in acquisitions experience higher abnormal returns than those, which employ non-Nordic financial advisers*

1.3.6 Cross-border acquisitions

M&A is a swift way for companies to grow inorganically compared to the longer time related to strategic organic initiatives. Depending on the motives behind the M&A agenda, companies may acquire domestic or cross-border targets. Glaister and Ahammad (2010) made a study of strategic motivations for cross-border mergers and acquisitions based on a sample of British companies acquiring targets in Europe and North America. They found that the highest ranked motives for making cross-border acquisitions were faster establishment of presence in new markets, gain new capabilities and gain strategic assets, such as cheaper manufacturing facilities or important knowledge. However, there are

several challenges for buyers when engaging in cross-border acquisitions. Institutional and cultural values may be unfamiliar to the acquirer. New accounting methods may lead to troubled due diligence processes. New legal systems may have different property rights protections making cash flows uncertain, or the potential cultural differences may lead to a complicated process of integrating assets into acquirer's operational setup and further strategy (Mantecon, 2009).

This paper is conducted in a Nordic context where the geographical distance between countries is relatively low. The Nordic countries share many similarities, but also differences. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) established that countries in the Nordic region share the same level of legal systems, including law enforcement, investor protection and ownership concentration. However, even though the countries are often interpreted as a group from a global perspective, there are some significant differences. None of these countries shares the exact same language, and they are all still using their own currencies except for Finland that has accepted the euro. Sweden, Denmark and Finland are all member states of the European Union, but this is not the case for Norway. Instead, Norway is member state of the European Economic Area. Finally, all the countries share some cultural perspectives, but they also differ on important ones. Hofstede, Hofstede and Minkov (2010) found six cultural dimensions to give an estimate of 70 countries' cultural differences, where several dimensions are related to work ethics. For example, Denmark scores half in Power Distance compared to the other Nordic countries, which is a measure of people's expectation and acceptance that power is distributed unequally in institutions and organisations. Another example is that Finland scores more than double in Uncertainty Avoidance compared to Sweden, which is a measure of the need of structure and predictability in their work life (Hofstede et al., 2010). These cultural differences could lead to several implications when engaging in cross-border mergers and acquisitions, leading to loss in synergies and knowledge transfer.

In an American context, Cakici, Hessel and Tandon (1996) present evidence that cross-border acquisitions into the US experience significant positive abnormal returns of almost 2% to acquirers' shareholders, based on a sample of 195 companies acquiring American targets. At the same time, Eun, Kolodny and Scheraga (1996) made a similar study on foreign acquisitions of American firms, but they found that foreign acquirers were experiencing a negative abnormal return of -1.2%. Later, Moeller and Schlingemann (2005) established empirical evidence that domestic acquisitions outperform cross-border acquisitions, based on a sample of 4,430 acquisitions made by American firms. Furthermore, they found that bidder returns are positively correlated to the shareholder protection, accounting standards and the M&A activity in the target country.

In a European context, Goergen and Renneboog (2003) found a significant correlation between gains for the target shareholders and the total gains for the merged company. Thus, their evidence suggests that target and bidder returns are correlated. They also found that acquirers' shareholders were

experiencing positive abnormal returns of 3.1%. Conversely, Martynova and Renneboog (2008) found that cross-border acquisitions led to a considerably lower abnormal return related to similar domestic acquisitions. Finally, Danbolt and Maciver (2012) made a study of cross-border acquisitions into and out of the UK and found weak evidence that acquiring firms would gain from entering new markets. Results from previous research on European cross-border acquisitions vary distinctly, concluding that research within this area is inadequate.

From the above findings of Nordic differences in cultural dimensions and cross-border transactions in the US and Europe, we state one hypothesis to be tested in this thesis:

H_{10}: *Domestic acquisitions outperform cross-border acquisitions measured in abnormal returns*

1.3.7   Consideration type

The consideration type (or means, mode or method of payment), e.g. cash, stock or a mix of the two, used in mergers and acquisitions, is a variable known to be influential on value creation effects. The choice of what method to use is at the discretion of both target and bidder, i.e. a negotiation process, and is a result of both practical and theoretical matters. D. K. Datta et al. (1992) mention a number of ways the mode of payment is able to affect the value creation in both practical and theoretical terms. Firstly, they argue that the speed of the transaction is often dependent on the consideration chosen. They claim that cash deals are faster to complete, since stock deals may involve stock market transactions (e.g. equity and/or debt underwriting or exchanges) and regulatory approval (e.g. filing with the SEC), which may slow down the process. This is all at the expense of bidder in both competitive and literal terms and might give competitors time to make a counter-offer, potentially benefitting the target.

Secondly, however, the use of cash as payment method may induce tax liabilities on target shareholders (dependent on the regulatory framework of the target and in which the deal is settled), which an exchange of stocks does not impose right away. Thus, target shareholders may require an increased premium if the cash deal is to succeed. In addition, the target also bears some of the risk of bidder's share price to decline in value until settlement, etc.

As a third point, which is more theoretical in nature, the authors mention that the issuance of equity is viewed negatively by the market, i.e. the firm sends a bad signal about expectations for the future and also that stock offers may imply a transfer of wealth from shareholders to debtholders. In essence, they talk about the trade-off theory of capital structure and the pecking-order theory. The trade-off theory is in contrary to Miller and Modigliani's propositions that firms should lever as high as possible. Instead, the trade-off theory tells us that firms should increase financial leverage until a certain point (their target debt ratio) where they can sustain interest payments and instalments securely. That is, firms with risky assets and low taxable income should finance with equity mostly, and firms with safe assets and high

stable income should use a high target debt ratio (Brealey, Myers, & Allen, 2017). Thus, if a firm is already close to its target debt ratio, or is highly profitable and yet chooses to issue new equity to pay for an acquisition, the market might interpret this as a bad sign.

The pecking-order theory, however, can help explain financing choices. Brealey et al. (2017), of which the former popularised the theory, explain it with asymmetric information problems. Managers (agents) know more than the shareholders (principals) about the firm, and if not informed properly by management, investors will fail to interpret the message that management implies when choosing financing method in acquisitions. When management chooses to issue new equity, and investors are uninformed, management implies that the firm's stock is overvalued, which in turn implies that their expectations about the future are bad. Thus, a pecking order is established. Firstly, internal funds (saved earnings) are used, then new debt is issued and lastly new equity is issued. In contrast to the trade-off theory, there is no clearly defined target debt ratio, as internal/equity financing is both at the top and bottom of the pecking order and the pecking order thus tells us about the signalling that management (implicit or explicit) sends to the market, when choosing financing methods of new projects. The theories mentioned above can then help us to better understand both the management choice in settlement method in acquisitions and the following effects on value creation.

In studies on the effect of consideration type on short-term value creation, the literature generally agrees on the fact that pure cash deals generate higher bidder CARs, which is in line with the pecking-order theory. Travlos (1987) is one of the most cited papers on the subject and one of the first papers to give a more compelling evidence on the significance of settlement type. He examines the relationship between the method of payment and the effect of bidders' common stock prices in both mergers and tender offers and sets forth the pecking-order theory of financing as his opening hypothesis. He uses US data from 1972 to 1981 comprising 167 bid announcements. Overall, he finds evidence for cash offers generating higher bidder returns in the sense that pure stock exchange offers decrease returns to bidder's shareholders, while shareholders in cash deals earn "normal" returns. Further, the effect does not depend on the deal being either a tender offer or a merger. Thus, he concludes his studies by stating that the signalling hypothesis holds.

Sudarsanam and Mahate (2003) examine the relationship between payment method and acquirer type, i.e. if bidder is a "glamour" acquirer (firms with high valuation and good growth prospects) or a "value" acquirer (firms with low valuation and inferior growth opportunities). They introduce two hypotheses: 1) glamour acquirers are more likely to use equity payments; and 2) value acquirers outperform glamour firms in all acquisitions in the long run. They use a sample of 519 UK acquirers from 1983 to 1995. They summarise their findings by stating that they find some evidence on glamour acquirers using equity payments more often than value acquirers do and that value acquirers more

frequently use cash. In addition, they find evidence on glamour acquirers paying with equity seriously underperform those paying with cash.

In Goergen and Renneboog (2004), studies are performed on large intra-European domestic and cross-border acquisitions and they too cite the pecking order theory implicitly. They sample 187 acquisitions with deal values above EUR 90 million in 18 different countries. On means of payment in takeover bids, they however do not find evidence to support the theory unlike most other papers, which might seem somewhat surprising. They contribute this finding partly to the fact that they only survey large deals in which the payment method may be restricted compared to smaller deals where cash payment is more easily available. Martynova and Renneboog (2008) further support this finding and state that US studies generally align with the pecking-order theory, whereas European studies do not.

In the light of the theories above, we prepare two hypotheses to be tested within this subpart of the thesis:

H_{11}: *Deals completed with cash settlement outperform (show higher abnormal returns than) those completed with equity settlement*

H_{12}: *A negative effect on abnormal returns is expected from deals completed by companies with high valuation and payment with equity*

1.3.8 Strategic rationales

The reasons and motives for firms to engage in mergers and acquisition are numerous, but not all motives are equally satisfying for market participants or shareholders. Some motives are easy to convince shareholders into agreeing that a deal is solid and a good path to value creation, while others require great efforts to convince shareholders, both before and after deal completion. In other words, the strategic rationales of deals are important to shareholders, as they base their view on the firm's future (and thus its valuation) on such events. Thus, if markets are efficient, we should be able to determine which strategic objectives behind mergers and acquisitions that are viewed and valued the highest by shareholders and which are not, as they should incorporate views into the stock pricing right away.

Sudarsanam (2010) takes a deeper theoretical look into what drives M&A on both an economic and a strategic level in horizontal and vertical deals[2]. He starts on an aggregate level stating that, in mature industries, many mergers happen because of low growth prospects and excess supply-side capacity, which then increases the need for consolidation and efficiency improvements for firms to be competitive. While being true, it is of course only a single scenario of motives behind mergers, but overall the point is clear. Further, he continues to granulate motives (or sources of value as he puts it)

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[2] As this section only constitutes a subset of this thesis, and the theoretical literature on the subject is vast, we will only touch the theory of each rationale category lightly. For further reading, we refer to Sudarsanam (2010), chapters 5 and 6.

behind M&A into three overall categories: 1) revenue (growth) enhancing strategies; 2) cost reduction/synergies motives; and 3) generating new resources and capabilities. Next, all three categories are divided further into types of value sources within each strategic rationale.

On revenue enhancing motives, he mentions four sources of value creation: 1) increased market power; 2) network externality; 3) acquisition of complementors; and 4) leveraging marketing resources and capabilities. Increased market power, and thus larger revenue, can be achieved through horizontal mergers, since mergers increase the market share of the firm. This has the ability to give the firm enhanced bargaining power and to some extent dictate prices in the market, potentially very lucrative in highly price sensitive markets. According to Sudarsanam (2010), studies have shown that increased market shares increase profits. Network externalities can achieve revenue growth for companies as well. They exist when the customer's value perception of a product depends on how many other customers use the product (e.g. the internet and software products). In acquisitions, merging with a company whose customers would benefit from the acquisition (e.g. in being "connected" with other users of the product) could increase the total network size and thus be value enhancing for the acquiring firm. Leveraging the marketing resources of each other can generate growth in a number of ways. Distribution channels already established may be used to cross-sell products, increasing total throughput of products. This can for example be achieved when one of the merging firms has resource surplus or is better at employing those resources.

The other major category of strategic value creation is through cost savings and synergies. With reference to the above, this rationale is quite common in horizontal mergers within mature industries. Cost synergies are often easy to quantify compared to sales synergies and might be easier to communicate to shareholders. Value creation through cost savings is attainable through many underlying drivers. By reducing excess capacity in the industry, firms can mitigate price pressure and strong rivalry and in turn increase profits. Firms might encounter one-off costs (e.g. to laid off workers) if a reduction of capacity means shutting down a division or corporate function, but long term costs will be down, increasing shareholder value. Economies of scale is another sought factor for firms wishing to increase profits. Economies of scale is achievable in a variety of places, for example firms only need one headquarters when merging firms, duplicate R&D costs related to the same object of research can be reduced and marketing expenses can be pooled or reduced in line with the number of continuing brands. In contrary to economies of scale is diseconomies of scale, which can arise in mergers as a result of "diffusion of control, complexities of monitoring, ineffectiveness of communication, and multiple layers of management" (Sudarsanam, 2010, p. 134). This in turn can offset the potential gains from economies of scale. In M&A, learning economy may prove to be a valuable factor, as mentioned above in regards to frequent acquirers. Economies of learning is when firms and workers learn over time, thus become more experienced and efficient at producing, and it is a function of the cumulative output of

prior periods. In an acquisition of for example a competitor, production volumes might increase substantially and thus provide solid learning opportunities for both parties in the merger, allowing for potentially large cost savings or increased output at a constant cost base.

The last of the three major categories is the resource-based view (RBV) of M&A-driven value creation. Not all acquisitions are based on a strategy to increase revenue or market share or to reduce costs and improve margins at first. Instead, acquiring firms seek resources and capabilities that enhance their ability to achieve sustainable competitive advantages in the long term and consequently increase long-term shareholder value. When acquiring firms target firms with resources that they do not possess themselves, a redeployment of resources and capabilities takes place. The motives for these acquisitions are attributable to numerous factors, including organic growth opportunities being limited as a result of old routines and habits that are hard to break and thus not being able to develop new capabilities. Rapidly changing competitive market forces may be prevalent, and the firm may experience time constraints, making M&A the most viable solution. In M&A, these transfers of resources and capabilities essentially create real options on the future of the firm and could thus be valued by outside investors as such. Sudarsanam (2010) assigns acquisitions of resources into two groups: path-dependent changes (when acquirers build on existing capabilities) and path-breaking changes (when acquirers chase new non-existing capabilities and pursue new paths to create unique sources of competitive advantage). An important example of resource acquisitions is brand-driven acquisitions, as strong brands create shareholder value at lower risk than weak brands (Madden, Fehle, & Fournier, 2006). For redeployment of resources to be successful, Sudarsanam (2010) mentions that acquisitions must be fungible, both firms must be capable of "unlearning" old habits and learn new skills and routines. In addition, path-breaking acquisitions often involve organisational changes, which are often hard to implement successfully.

In the empirical literature, several studies have tried to examine acquisition motives and the associated value creation. One much referenced paper is Walker (2000). He investigates several points related to strategic objectives in M&A and acquiring firm shareholder value. Sampling is done between 1980 and 1996 using US deals announced in the Wall Street Journal and with stock price data from the CRSP database, yielding a final sample of 278 acquisitions. In assigning strategic objectives, he uses six mutually exclusive categories: 1) expand geographically; 2) broaden the product line; 3) increase market share; 4) integrate vertically; 5) diversify (no overlap); and 6) diversify (overlap). His event study results conclude that shareholders of bidder firms generally do not earn abnormal return regardless of strategic objective, with the exception that diversification with overlap earns significant negative abnormal returns. In multivariate regression analysis, he concludes that the two strategic objectives: geographical expansion (1) and increasing market share (3) provide positive abnormal returns. He further confirms the hypothesis that cash payments generate higher CARs than equity payment.

Conversely, Ghosh (2004) finds evidence in favour of the efficiency theory (merging firms benefit from all types of mergers, horizontal or vertical) in that increased market share leads to increased CAR for the combined firm (he uses a weighted average CAR of target and bidder). He controls for the market power hypothesis (firms experience maximum wealth gains from horizontal mergers) and reports that a 1% increase in market share increases shareholders' wealth gain by 47% (significant at a 1% level). In addition, he does not find evidence in favour of the market power theory, which is consistent with the findings of Eckbo (1983, 1985).

Doukas et al. (2002) examine both short and long-term value effects in Sweden from 1980 to 1995 with a focus on diversification through M&A. They sample 93 bidders that acquired 101 targets. They find that diversifying acquisitions lead to negative returns upon announcement and deteriorating operational performance subsequently. They conclude that their findings are consistent with the agency cost theory as their evidence point to the fact that acquisitions of peripheral business lines have adverse effects on short and long-term performance, suggesting that diversification happens at the expense of the shareholder.

Thus, our hypotheses to be tested are:

H_{13}: *Deals announced with revenue enhancing motives experience positive abnormal returns*

H_{14}: *Deals announced with cost-saving motives experience positive abnormal returns*

H_{15}: *Deals announced with resource acquisition motives experience positive abnormal returns*

Finally, we believe that for the revenue enhancing motives and cost-saving motives, abnormal returns are generally highly correlated with relatedness of targets in terms of industry affiliation, and thus we test:

H_{16}: *Deals announced with revenue increasing or cost-saving motives and in related industries experience higher abnormal returns than those in unrelated industries*

2 Method and data

2.1 Data description and sampling

2.1.1 Data sampling

2.1.1.1 Initial sampling

We use Capital IQ as the primary database, which is a well-known research and data analysis company acting as a subsidiary of Standard & Poor's and was initially created for the investment banking industry. It is recognised as a leading empirical tool in financial work and is closely related to the Compustat database often used in US academic studies. It comprises extensive global M&A coverage and has been applied in several M&A-related academic studies.

As secondary databases, we use Mergermarket, Zephyr and Bloomberg together with Capital IQ to compile an unique dataset from respectable sources used both academically and in practice in the M&A industry. We use the secondary databases to support the data initially gathered from Capital IQ in relation to additional data points and the screening of transactions. We gather data through the criteria shown below:

1. Bidder company has to be publicly listed at the time of the transaction
2. Both bidder and target have to be located in either Denmark, Norway, Sweden or Finland
3. The transaction needs to be considered as an acquisition or takeover, thus we exclude transactions considered as merger of equals
4. Bidder has to acquire the majority stake or obtain majority from the acquisition, i.e. a change of control has to take place
5. Information on share prices of bidder company has to be available in a period equalling 365 days before transaction announcement, corresponding to approximately 250 trading days, and at least 30 calendar days after transaction announcement
6. Financial information on bidder company prior to the transaction announcement and related to the thesis hypotheses has to be available
7. Transactions are omitted if: 1) they are valued less than EUR 5 million; 2) they are acquisitions of assets only, including properties, vessels or power plants; 3) they are made internally; 4) they are made by listed private equity or active industrial holding companies; 5) bidder companies are releasing financial reports in the event window; 6) are reverse takeovers; or 7) the deal is later cancelled
8. We make no timespan constraints, thus we include all available transactions meeting the above criteria

1) By using only transactions where bidder is publicly listed, we are able to observe movements in stock prices, which is a methodical requirement, when conducting the event study as described below. This allows us to measure the value creation through M&A activities. In addition, publicly listed companies are required to publish relevant information to the market, both financially and strategically, especially if the company engages in M&A activities. Therefore, we have been able to find other relevant information for this thesis e.g. number of transactions made by the company, financial advisers used in these transactions, etc. Conversely, target companies are not required to be publicly listed, which means that the sample includes listed, private and subsidiary targets (or divisional units). This has a positive effect, as it increases the statistical validity of our study. However, the data and information on target companies decrease greatly to a limited level, leading to fewer available control variables based on target characteristics.

2) Defining the Nordic region as the scope of this thesis, we have included only transactions in Denmark, Norway, Sweden and Finland. More specifically, both bidder and target have to be located in one of these countries. The countries in the region share many similarities, where La Porta et al. (1998) found that countries in the Nordic region share the same level of political and legal environments, increasing the similarity in terms of risk. However, there are several differences among these countries based on e.g. currencies, European trade agreements and importantly, cultural dimensions proven by Hofstede et al. (2010).

3) Another criterion is that the transaction has to be considered as either a takeover or an acquisition. Consequently, we exclude mergers of equals since we assume that these transactions imply a creation of a new entity, thus making it impossible to determine whom the bidder and target are. This is also the most common scope in similar studies (Goergen & Renneboog, 2004; Golubov et al., 2012; Moeller, Schlingemann, & Stulz, 2004).

4) Additionally, bidder companies have to either acquire a majority stake of target's shares or gain majority by acquiring a minority stake, so only acquisitions with a change of control are included, to distinguish between minority and controlling investments. Thus, by only including transactions of majority stakes, the sample consists of considerable share price reactions. We follow Capital IQ's definition of majority stake: "M&A transactions where percent sought is at least 50%". This is also the common definition in former research papers (Golubov, Yawson, & Zhang, 2015). Specifically, this means that we have included transactions where bidder may have an initial shareholding from 0% to 49.9% of target's shares, and post transaction the shareholding will exceed 50%.

5) For all transactions, we gather share price and volume time series related to bidders from Capital IQ complemented with data from Bloomberg. Following this fifth criterion, the share prices and volumes for a period of 365 calendar days before transaction announcement and 30 calendar days after transaction announcement are gathered to meet the estimation and event requirements for the event

study. Using share prices and volumes is the most common approach in previous research papers based on event studies (MacKinlay, 1997). We account for missing data in the total period by employing trade-to-trade return adjustments, as described in the methodology section 2.2.4 below.

6) This criterion is included to gather information on variables related to the hypotheses of this thesis (i.e. the seven sections outlined in the theoretical and literature review). Transactions fulfilling the before-mentioned criteria will be included in the event study, but if the transactions lack information of financials and M&A activity, they will be omitted in the cross-sectional multiple regression analysis.

7) We omit transactions if they are acquisitions of most types of assets, including properties, vessels, power plants and bankrupt assets, e.g. bankrupt bank assets following the latest financial crisis. We do include however, divisional units if they include a larger fragment of the selling company and comprise e.g. employees, assets and customer contracts. Acquisitions of property are not related to the company's business operations with the exception of companies engaged in rental of properties. However, based on observations of property companies, we do not expect significant abnormal returns during property transactions. Therefore, we exclude these types of deals.

Further, we exclude any transactions made internally in an organisation or conglomerate, or if the transaction is made by listed private equity/active industrial holding companies. As an example, the Norwegian industrial conglomerate, Aker ASA, acquired Kværner ASA in 2005. Kværner was already a part of the conglomerate, but the two parties entered into this agreement to simplify the existing group structure. An almost non-existing premium of 2% was paid underlining our expectation of minimal or non-existing premiums when internal transactions are being processed. Thus, we assume that these types of transactions will not lead to significant abnormal returns. We also omit transactions made by listed private equity firms, such as Ratos AB or active industrial holding companies, since these are not driven by the same factors as other companies. These types of bidder companies are not making transactions based on strategic rationales, but with the purpose of making competitive returns to their investors. Thus, we expect the share prices of such holding or industrial conglomerate firms to exhibit different share price behaviour than traditional companies.

The criterion of deal value larger than EUR 5 million is consistent with the choice of financial databases in this thesis. Mergermarket only includes transactions with deal value above EUR 5 million, so naturally we set the minimum value at this level to use this well-known financial database from the M&A industry. In addition, this helps us acquire the aforementioned financial data, since we consequently limit ourselves to only include companies of a certain size. Furthermore, research papers regularly set a minimum deal value as a criterion in their studies (Golubov et al., 2015; Harford et al., 2012; Masulis, Wang, & Xie, 2007). Each deal value is manually confirmed using three different financial sources, i.e. Capital IQ, Mergermarket, Zephyr, as well as stock exchange filings and press releases. We acknowledge that setting this threshold and further not including deals with unknown

transaction values could potentially introduce bias in our results, however we believe this to be of minor importance. We discuss this further at the end the paper.

Next, transactions are also excluded if bidder company releases financial reports during the event window. The main reason is that both transaction announcements and financial releases will affect the share price development, and it will not be possible to distinguish between the separate effects from the two incidents – i.e. the announcement of earnings within the event window introduces noise in the abnormal return estimation procedure.

Then, we only gather announced or completed transactions, since we are measuring the value creation through M&A activities, implying that we should analyse transactions that are not cancelled. Exclusion of cancelled acquisitions may generate a noteworthy bias if they are distributed differently across the variables included in this thesis. However, Travlos (1987) found evidence in his study that exclusion of cancelled transactions in the analysis are not biasing the results. It is also important to mention that excluding cancelled transactions is a widely used approach related to M&A research papers (Faccio et al., 2006; Golubov et al., 2012; Rosen, 2006). Bhagwat, Dam and Harford (2016) found that the firm value of the transacted firm can change significantly in the period between the listed bidder announces the acquisition to when the deal is set to close, leading to a risk of renegotiation or abandoning the deal. Because of this, movements in bidder share prices based on M&A announcements often reflect uncertainty. In other words, if a company announces an acquisition that the market seems unlikely to be completed, the share price reaction will reflect an uncertainty effect, decreasing the sample quality. We are aware that excluding cancelled transactions will not exclusively remove the uncertainty and increased risk effect set by the market. Nevertheless, we believe that it will increase the statistical validity of our data due to termination of deals where the market indicates a low probability of completion.

8) Next, since we include all available transactions meeting the above criteria, our final sample consists of transactions starting July 1995 to February 2018, which is close to the maximum period available in Capital IQ, based on the initial date of data search. By setting the sample period to include all transactions available through time in Capital IQ, the statistical validity increases. The long sample period also addresses potential survivorship bias, which is the tendency of excluding companies that have failed to survive during the period. Survivorship bias can increase the skewness of the results, since only companies which survived the data period are included (Uddin & Boateng, 2014). The long sample period together with databases reporting M&A activity on a daily basis increase the generalisability of the findings from this study. Furthermore, each announcement date is manually verified using three different financial databases such as Capital IQ, Mergermarket, Zephyr as well as stock exchange filings and press releases. This increases the validity of the thesis results drastically, as knowing the exact event date is important for the event study method.

Finally, the transaction data sample gathered from Capital IQ is enriched by additional transactions from Mergermarket found by utilising the same sampling procedure as described above. Mergermarket is also a well-known financial database in the M&A industry and the large sample of deals from both Capital IQ and Mergermarket further increases the validity of this thesis. For any discrepancies between the two databases, we check and obtain the correct data from stock exchange filings, press releases and other official sources.

Based on these criteria, we end up with a data sample of 627 transactions also referred to as events. We refer to Appendix A for a comprehensive list of each transaction in the final sample.

2.1.1.2 Additional sampling

Besides the main data sample we use in the analysis in this paper, we gather additional data on the Nordic listed bidder companies' historical acquisition activities. If each bidder company were to be classified as a frequent acquirer or not, based on our main sample, some M&A activities would not be included in the classification process (e.g. transactions outside the Nordic region). Therefore, we gather an additional data sample where all transactions made by each listed bidder company in the main sample are included, including both Nordic targets and non-Nordic targets. The sample is gathered based on some of the same criteria used in the initial sampling, while other criteria are relaxed. We include only deals with a transaction value of minimum EUR 5 million as in the main sampling procedure and further exclude acquisitions of some assets as well. In addition, we only include deals where a change of control is present, as with the main sampling and further only include completed deals (or assumed completed), as this is relevant for the learning hypothesis discussed in the theoretical review. Thus, deals that are only announced or cancelled are excluded.

2.1.1.3 League tables and financial adviser reputation

In determining the value created by employing top-tier advisers contrary to non-top-tier, a measure of reputation or "tier-affiliation" needs to be constructed and assigned to all observations in the dataset. The literature reviewed generally suggests two methods.

In a study by McLaughlin (1992), he uses the methodology described in Carter and Manaster (1990), which is a study on IPO performance and underwriter reputation. Carter and Manaster (1990) assigns a value from 1 to 9 to the banks in the underwriting syndicate, 9 being the most prestigious. The assigned value is based on the relative position within the announced syndicate found on the transaction tombstone and is further compared from announcement to announcement. Additionally, McLaughlin (1992) assigns each banker to one of three groups, with the most prestigious banks (rank 9) in a high-quality group, ranks larger than 8 and less than 9 is medium quality, and lower than 8 is low quality bankers. Thus, a hierarchy (or tiers) is developed. If a firm uses more than one banker, the rank of the highest quality banker is assigned to the observation. This method has the advantage of the rank

being determined at the exact moment when a deal is announced/in process. However in M&A, employment of syndicates in the same manner as in equity capital market (ECM) transactions is not common, which can make it harder to determine relative positions, and often the relative position is not published, not allowing for such an analysis.

Another more simple and intuitive approach, which resembles the way investment banks themselves measure their own and their competitors' placement/reputation in the market, is used by Golubov et al. (2012). Following the method of Fang (2005), these authors create a *league table* of deals in the relevant period and market space, usually the same period and with the same geographical delimitation as in their sampled deals. The league table sums the values of all the deals advised by each investment bank in the sample and next sorts the banks according to their aggregate values with the highest values on top, and presents the number of advised deals alongside. Next, they divide all advisers into two groups, top-tier and non-top-tier with the top eight values constituting the top-tier investment banks. Although this top eight cut-off is arbitrarily set, both papers show consistency across other cut-offs. The main advantages of this method are its ease of use and interpretation, and it is easy to implement, as data is widely available.

Both methods agree that a rigid hierarchy exists in the investment banking industry, and investment banks should be divided as such (Carter & Manaster, 1990; Fang, 2005). In addition, Golubovet al. (2012) points out that a discretionary split is econometrically preferable, since the use of a continuous variable would require reputation to be measured more accurately. According to the above, this can be quite tough and a continuous variable would require to have a constant effect on the dependent variable. Thus, in this thesis, we have chosen the latter approach in determining financial adviser reputation.

We construct a set of league tables in the period 1998 to February 2018, with data from Mergermarket, on all deals in the Nordic region. We include all completed M&A deals with a disclosed transaction value above EUR 5 million, including minority stakes and both buy and sell-side transactions, with both targets and bidders being Nordic companies. Full credit is given to both buy and sell-side advisers in each deal. If one side has multiple advisers, every adviser gets full credit for the deal. As we intend to show differences between Nordic and non-Nordic adviser reputations, we construct three league tables. Firstly, we create a table of all investment banks used in deals across our sample period, which is to be used in the analysis of H_7 and H_8, and further divide this into top-tier and non-top-tier, adopting the top eight cut-off from the previously mentioned research. This table is presented below in Table 2.1. Secondly, for the following analysis of H_9, we create two additional league tables, one for Nordic-based advisers (defined as those advisers mainly focusing on the Nordic market and thus domiciled within the Nordics), and a non-Nordic adviser league table with the residual of the first table. These two tables are presented in Appendix B and Appendix C respectively.

Table 2.1
League table – top 25 M&A advisers

League table of financial advisers sorted by deal value in the period from 1998 to February 2018. Only deals with disclosed deal value are included, both buy and sell-side are included, both bidder and target have to be in a Nordic country and full value is assigned to all advisers in a given deal.

Rank	Financial advisor	Value (EURm)	Number of Deals
1	Morgan Stanley	122,886	79
2	Goldman Sachs & Co. LLC	108,795	50
3	SEB	93,008	301
4	Carnegie Investment Bank AB	87,591	216
5	JPMorgan	85,564	61
6	Nordea	77,873	166
7	UBS Investment Bank	70,875	44
8	Handelsbanken Capital Markets	65,220	174
9	Lazard	50,235	38
10	Citi	48,872	25
11	Lehman Brothers	45,479	18
12	Deutsche Bank AG	44,981	38
13	Merrill Lynch	34,710	18
14	ABG Sundal Collier Holding ASA	33,492	131
15	Danske Bank Corporate Finance	33,035	114
16	Bank of America Merrill Lynch	28,986	7
17	Pareto Securities AS	27,689	117
18	Mandatum & Co Ltd	27,524	29
19	Credit Suisse	24,318	21
20	DNB Markets	17,771	71
21	EY	17,295	95
22	Arctic Securities AS	16,695	66
23	Rothschild	16,608	20
24	PwC	16,148	136
25	Fondsfinans AS	15,850	48

2.1.2   Data description

To give a more comprehensive understanding of the final data sample explained above, this section gives a descriptive and illustrative overview.

Figure 3 below illustrates all 627 events in our final data sample in total and distributed per bidder country. Swedish listed companies perform most mergers and acquisitions in the Nordic region, representing 44% of total transactions, followed by Norwegian and Finish companies with similar levels of activity of 24% and 20%, respectively. Lastly, Danish listed companies seem to perform fewest M&A activities in the Nordic region, representing 12% of total transactions. This outcome is not surprising due to the market size of each country. Related to the merger wave theories, we see a wave tendency in the Nordic region where 2007 is the peak year volume wise. Our sample supports the findings of Sudarsanam (2010) who states that M&A activities are correlated with the economy, and more specifically the trend in the stock market. In addition, when comparing the events with the trend of the OMX Nordic 40 index[3], we see a clear correlation indicating that Sudarsanam's theory (2010) is valid

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[3] OMX Nordic 40 index consists of the 40 largest and most traded stocks on the Nordic exchanges (excluding Norway)

in the Nordic region. As mentioned above, the peak year of M&A activity completed by Nordic listed bidders is 2007. This is not surprising, since 2007 is the last year experiencing an economic boom before the global financial crisis emerged leading to recession and fewer company transactions (Rao & Reddy, 2015). There seems to be a small peak in 2001 backed by all four countries, which could be related to the economic boom up until the burst of the dot-com bubble (Ljungqvist & Wilhelm, 2003). Lastly, we see a high deal activity in the last three years led by Sweden, excluding 2018 since this year has not ended yet, potentially leading to a new peak year. Surprisingly, Finland differs from the other countries since it is not experiencing the same peak trend, where 2015 stands out as peak year followed by a decreasing number of yearly deals. The sample is gathered based on a set of stringent criteria, which gives us the impression that the data is somewhat descriptive for the total Nordic M&A market.

Figure 3. Transaction sample distributed by bidder country. The figure gives an overview of the deal activity announced by Nordic listed bidder companies during the given period from 1995 to the beginning of 2018
Source: Own creation
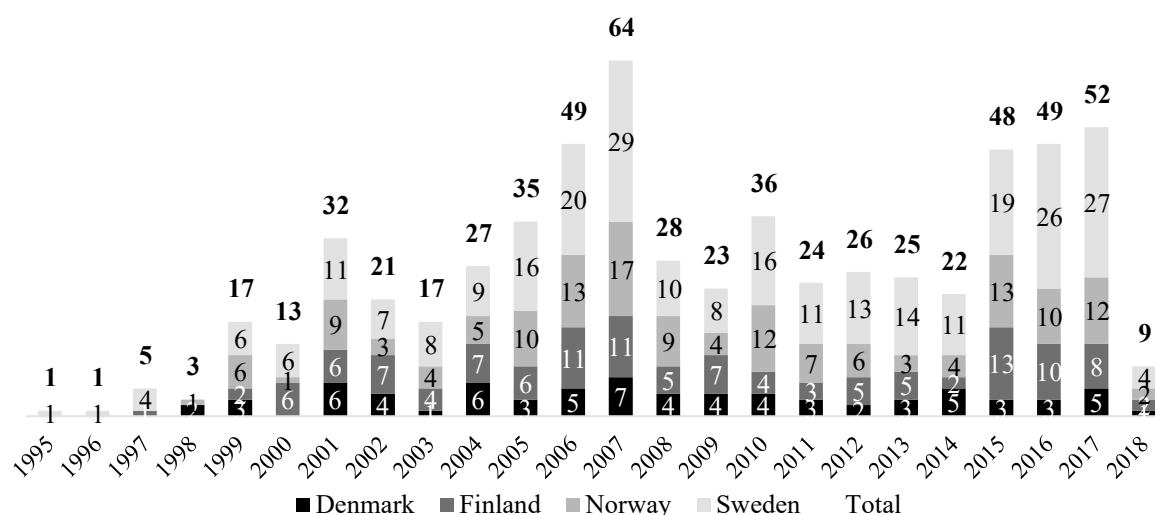
Table 2.2 below illustrates all 627 events distributed per deal characteristic and Nordic country related to several of the thesis hypotheses. Firstly, the table shows that 396 transactions, corresponding to 63% of the total number of deals, are characterised as domestic. This relationship of domestic/cross-border transactions is fairly consistent across all four Nordic countries. Goergen and Renneboog (2004) found a very similar distribution between domestic and cross-border deals of in their sample of European M&A activities. In their sample, 65% was characterised as domestic transactions and the remaining was characterised as cross-border deals. They found that bidder returns were significantly lower compared to target returns. As defined, we will test whether bidder returns are negatively affected by cross-border deals in a Nordic context.

The ownership structure among targets is almost solely private ownerships, where private targets represent 97% of the total number of transactions. The small number of transactions, including Nordic listed targets, was expected, but not the minimal proportion of listed targets. The ownership data will be

used in this thesis as control for bias from listing effect with Faccio et al.'s study (2006) in mind, where they examined the cumulative abnormal returns of deals involving listed and unlisted targets. This is further elaborated later in this paper.

Secondly, we see that bidder rationales comprise 49% sales rationales, 21% cost rationales and 30% resource rationales. This distribution is fairly consistent in all countries. However, Danish listed bidder companies announce mergers and acquisitions with a slight increased proportion of sales/growth rationales, resulting in fewer resource rationales, compared to the other Nordic countries. In addition, the proportion of cost rationales is roughly the same, with Norwegian listed bidder companies as an exception of which only 11% announce cost synergies as rationale behind transactions, resulting in additional resource rationales. Without further examination, this may be related to the fish farming and oil & gas industries, where unique resources such as fish farming licences issued by the Norwegian government and up and downstream techniques developed by leading energy companies are backing the large share of resource rationales. During the process of manually defining rationales for each deal, based on press releases, stock exchange filings and M&A databases, we could not find sufficient information related to rationales on 14 deals. Therefore, these will be excluded during the event study analysis related to the relevant hypotheses. This is to sustain an acceptable validity throughout this paper. Even though sales rationales represent half of total rationales, we consider the data sample to be adequate for further testing of all three types of rationales related to the presented hypotheses. On a final note, we acknowledge the fact that the allocation of rationale to each deal will be based on a subjective assessment and thus in some cases might introduce some noise or bias in the data. This also stems from the fact that we assign only one rationale to each deal, even though some deals might clearly show that the motive behind is based on more than one objective.

Cash is the most used method of payment representing 68% of all transactions in the data sample. Surprisingly, 22% of the transactions are mixed payments of cash and equity and last, the remaining 10% is equity payment. In perspective to Goergen and Renneboog's study (2004) of large intra-European domestic and cross-border acquisitions, they found the same majority of cash payments, which could be due to time of deal process, bargaining power or pecking-order theory. In comparison, they found equity payments to be the second most common method of payment followed by mixed payments. However, Sudarsanam and Mahate (2003) found that mixed payment is by far the most common payment method based on their data sample of UK acquirers. Finally, we find the distribution of consideration types in our data to give an insight into how mergers and acquisitions in the Nordic region are financed.

For the frequent acquirers we see a distribution that is highly skewed, as Swedish companies clearly acquired a lot more targets in the three years prior the deal, on average. This is not surprising as the Swedish market for corporate control is highly active compared to the rest of the Nordics. What is

interesting about the distribution shown is that most companies in fact acquired more than one company within the three years prior to the current deal. Only around 13% of the events in the sample did not acquire any companies lately. In the other end of the table, we see that 39 companies acquired five companies or more within the preceding three years, equivalent to around 6% of the total sample. Thus, not a lot of the companies in the sample can be considered frequent acquirers in the same manner as Fuller et al. (2002) define frequent acquirers. The implications from this is further discussed below.

Finally, all the transactions from our final data sample have been allocated to 11 sectors based on a two-digit GICS code, which is a common Global Industry Classification Standard, developed by S&P. Doukas et al. (2002) made the same approach using two-digit sector codes in their study of Swedish corporations, which is a fairly common method of defining the relatedness of firms in academic research. Most studies based on US and UK data use SIC codes, however we find that information on SIC codes were missing in many cases in our data. Instead, we turn to the GICS classification. Using this standard, we find data availability to be much greater in relation to our sample. The sectors where most Nordic listed bidder companies operate are Industrials, underlined with 28% of all transactions from the data sample, followed by Information Technology (19%), then Consumer Discretionary (10%), Financials (10%) etc. Please note that Swedish listed bidder companies due to their large share of the total transactions heavily influence this order. Unexpectedly, 36% of mergers and acquisitions completed by Danish listed bidder companies operate in the Financials sector indicating a substantial consolidation among Danish financial institutions in the past. After further examination, we confirm this previous trend since Denmark had almost four times as many commercial bank branches per 100,000 adults as Norway and Finland (The World Bank, 2018). This number has significantly decreased during the post-financial crisis period proven by our data sample. Another interesting factor is the Energy sector, which is primarily propelled by Norwegian listed bidder companies like the Real Estate sector is driven by Swedish listed bidder companies.

Next, we illustrate the characteristics of our final data sample of 627 transactions related to the applied control variables in the regression analysis. For a profound definition of the variables and supportive calculations, we refer to the method section and Appendix D. Firm size for bidder is measured as the market capitalisation. As illustrated below in Table 2.3, there seems to be a group of bidders that are significantly sizeable compared to the rest of the sample, as we observe a distinct difference between the average and median firm size of respectively EUR 2,789 million and EUR 369 million. Hence, a large standard deviation is expected. The skewness of the firm sizes in the data sample is positive with 6.2 indicating a right skewness, which we would expect due to the mean/median difference. Lastly, the noteworthy kurtosis of 62.4 (which measures extreme firm sizes in either tails of the distribution) indicates that a significant part of the data goes beyond the tails of a normal distribution.

Table 2.2
Transaction sample distributed by variables of interest

The table gives an overview of the deal characteristics of announced transactions by Nordic listed bidder companies during the period from 1995 to the beginning of 2018

		Denmark	Finland	Norway	Sweden	Total
Geography	Domestic	53	76	99	168	396
	Cross-border	21	49	52	109	231
	Total	74	125	151	277	627
Target company type	Private target	72	123	145	269	609
	Listed target	2	2	6	8	18
	Total	74	125	151	277	627
Rationale	Strategic	41	50	73	135	299
	Cost	19	30	16	63	128
	Resource	13	44	57	72	186
	Total	73	124	146	270	613
Consideration type	Cash	52	89	91	193	425
	Equity	11	16	17	19	63
	Mixed	11	20	43	65	139
	Total	74	125	151	277	627
Financial adviser	No adviser	49	53	93	155	350
	Non-top-tier adviser	10	49	37	69	165
	Top-tier adviser	15	23	21	53	112
	Total	74	125	151	277	627
Acquisition experience	0 acquisitions last three years	17	12	17	36	82
	1	34	70	63	132	299
	2	16	27	30	52	125
	3	1	9	17	29	56
	4	1	5	7	13	26
	> 4 acquisitions last three years	5	2	17	15	39
	Total	74	125	151	277	627
Sector based on 2 digit GICS	Consumer Discretionary	8	11	2	42	63
	Consumer Staples	3	15	22	17	57
	Energy	1	0	17	1	19
	Financials	27	4	19	13	63
	Healthcare	2	4	3	15	24
	Industrials	19	30	29	97	175
	Information Technology	3	29	44	42	118
	Materials	2	10	1	7	20
	Real Estate	0	4	0	22	26
	Telecom. Services	9	12	10	19	50
	Utilities	0	6	4	2	12
	Total	74	125	151	277	627

Table 2.3

Descriptive statistics of the sample control variables used in the regression analyses

The table gives an overview of the control variable characteristics of announced transactions by Nordic listed bidder companies during the period from 1995 to the beginning of 2018. These will be applied in the cross-sectional multiple regression analysis. For an in-depth elaboration of the variables, we refer to the method section below.

	N	Mean	Median	SD	Kurtosis	Skewness
Firm size	627	2789.3	368.7	7374.2	62.4	6.2
Relative size	627	0.58	0.098	6.71	604.1	24.4
Public target dummy	627	0.029	0	0.17	32.9	5.6
Sigma	627	0.022	0.019	0.015	46.0	5.0
Run up (BHAR)	627	0.00041	0.00023	0.0019	25.3	2.1
Leverage (D/E)	627	0.25	0.18	0.25	3.6	1.2
Insider ownership	627	0.068	0.0015	0.14	12.6	2.9

Relative size exhibits the ratio of the target value divided by bidder size. Again, we note a great difference between the mean and median indicating that a minor part of the transactions are characterised with a considerable relative size ratio. As the name indicates, public target dummy is a dummy equal to one if target in the transaction is publicly listed. We see that most of the targets in the sample are not listed, based on the median of zero and the insignificant mean of 0.029. This is supported by a relatively low standard deviation. Again, we observe that the data is right skewed and data tails exceed comparable ones of a normal distribution. This trend is also the case for run-up, which is the market-adjusted buy-and-hold return of bidder's stock over a 240-day window (with reference to the method section). Sigma (the volatility of acquirers' stock) appears to be more stable across the sample, based on the minor mean/median difference with a relatively low standard deviation, compared to previous characteristics. Leverage exhibits the debt-to-equity ratio for bidders, which is observed to be relatively stable due to the minor difference between mean and median. In addition, the standard deviation is equal to the mean indicating insignificant variation. This characteristic is slightly right skewed and has tail data that to some degree exceeds normal distribution tails. Lastly, insider ownership illustrates the internal ownership stake in the firm (e.g. management and other insiders' ownership stakes). There seems to be significant difference between the mean (0.068) and median (0.0015) indicating that a smaller part of the bidder companies in the sample are characterised with significant internal ownership stakes compared to the overall sample. This is underlined with tail data exceeding tails from a normal distribution, based on a kurtosis of 12.6.

Finally, we define and illustrate merger waves in the 11 GICS sectors through time. We follow a similar approach to manually define merger waves in a given sector as Carow, Heron and Saxton (2004) and Xu (2017). To identify a merger wave, we need to identify peak years within a given sector, where we first define peak years to have more than 10 deals, similar to previous studies. Secondly, additional peak years are relevant if they are larger than the largest peak within the sector minus the standard deviation of sector deals per year through time. By using standard deviation instead of setting a fixed limit to determine other peak years, we allow for differences in the absolute level of M&A activity

across sectors. These criteria enable more than one merger wave to occur in a given sector through our given period from 1995 to 2018. This is essential based on previous studies, which found several merger waves to occur in a 20-year period (Sudarsanam, 2010). Next, the start-year of a merger wave is found by moving backward until we establish the year when the number of deals is less than half of the peak year. The end-year of a merger wave is found with the same approach, but by moving forward until we establish the year when the number of deals is less than half of the peak year. Since our sample is notably smaller than the samples examined by Carow et al. (2004) and Xu (2017), we merge those sectors with a natural connection resulting in the following industries: 1) Consumer Discretionary and Staples; 2) Energy, Materials and Utilities; 3) Financials; 4) Healthcare; 5) Industrials; 6) Information Technology; 7) Real Estate and; 8) Telecommunication Services. Based on the elaborated approach and illustrated in Table 2.4, we define eight merger waves since: 2) Energy, Materials & Utilities; 4) Healthcare; 7) Real Estate; and 8) Telecommunication Services do not fulfil the peak year criterion of more than 10 deals. When performing this approach to determine waves, we need to emphasise that merging sectors may lead to questionable effects in a validity perspective. However, we believe that this will not have a major effect since we are only merging sectors with a natural connection, based on our own assessment. As a result, we are able to address waves in the consumer related sectors, which would be ignored based on our merger wave criteria.

Table 2.4 illustrates that almost all eight merger waves occur during strong economic times where the waves are centred at the period before the global financial crisis and the years from 2015 to 2017, with the exception of the Industrials merger wave from 2010 to 2011. The recent years from 2015 to 2017 experience strong economic times proved by higher GDPs for all four Nordic countries compared to pre-financial crisis, similar employment rate and the OMX Nordic 40 trading at an all-time high (European Commission, 2017). These findings agree with previous studies (Rhodes-Kropf & Viswanathan, 2004; Shleifer & Vishny, 2003; Sudarsanam, 2010). However, please note that we cannot determine whether the latest merger waves have ended since the data sample is not sufficient for 2018 and thus we make no such assumptions and conclusions.

Table 2.4
Sector merger waves based on transaction sample

The table gives an overview of industry merger waves based on announced transactions by Nordic listed bidder companies during the given period from 1995 to the beginning of 2018

	Consumer Discretionary & Staples	Energy, Materials & Utilities	Financials	Healthcare	Industrials	Information Technology	Real Estate	Telecom Services
1995	0	0	0	1	0	0	0	0
1996	0	0	0	0	1	0	0	0
1997	1	0	1	0	3	0	0	0
1998	0	0	1	0	1	1	0	0
1999	2	2	5	0	4	3	0	1
2000	1	3	0	0	6	2	1	0
2001	4	1	6	1	10	6	0	4
2002	2	1	4	1	5	6	0	2
2003	3	3	2	1	3	3	1	1
2004	5	2	1	0	10	4	0	5
2005	8	3	4	2	7	5	2	4
2006	13	1	3	1	15	12	0	4
2007	16	6	10	3	11	12	3	3
2008	2	1	6	1	9	6	1	2
2009	3	4	3	1	5	2	2	3
2010	5	3	2	0	14	9	0	3
2011	5	3	2	1	8	1	3	1
2012	8	4	1	0	5	6	0	2
2013	7	0	3	0	7	4	1	3
2014	4	0	3	0	6	6	1	2
2015	10	4	0	6	11	11	4	2
2016	13	3	3	3	12	10	2	3
2017	7	6	2	1	19	8	5	4
2018	1	1	1	1	3	1	0	1
Total	120	51	63	24	175	118	26	50

2.2 Event study

In this thesis, we employ two methods in analysing the value creation of firms within our sample: 1) an event study, which will be the main method of the paper; and 2) a cross-sectional multiple regression analysis, based on the results of the event study. Below, we explain the steps undertaken in analysing the data and the implementation of each method.

2.2.1 Event studies and the efficient market hypothesis

The event study methodology is widely employed within economics and finance and used in a variety of different applications when the purpose of the analysis is to determine the effects on share prices and thus value creation in firms. Fama et al. (1969) formulated a hypothesis around the information contained in stock splits and changes in future dividend levels. By investigating the share price abnormal

returns around the time of the split, they find that returns preceding the stock split are generally high and increasing prior to the split. They attribute the increases to the market anticipating substantial dividend increases, and when controlling stock splits for these dividend changes, they find that the previous price effect vanishes. On a concluding remark they state that their evidence provides "considerable support" to the efficient market hypothesis (Fama et al., 1969).

Fama et al.'s (1969) statement regarding their findings' support to the efficient market hypothesis is quite significant. This is true, since one main assumption regarding event studies is crucial to assert before carrying out the study, namely the assumption that financial markets are efficient and investors are rational (MacKinlay, 1997). As mentioned in the part on value creation and measurement, stock prices represent the shareholders' claim on the firm and thus the value created for those shareholders. Consequently, if financial markets are efficient it should be possible to examine the effect of mergers and acquisitions on the shareholders' wealth, using an event study approach. If one examines the efficiency of markets more closely, it is thus possible to conclude on the efficiency of event studies, and vice versa.

It is well-known that for a market to be efficient, all relevant information has to be reflected in the market price (the Efficient Market Hypothesis) and further that financial markets can be efficient in one of three forms as originally stated by Fama (1970). The three forms of efficiency are: 1) *the weak form* – prices reflect all historical information; 2) *the semi-strong form* – prices reflect all historical and public information; and 3) *the strong form* – prices reflect all historical, public and insider information. The general outcome of the EMH is that it is not possible for a market participant to outperform the market, as competition adjusts prices immediately to reflect that no projects with positive NPVs are available. This is, however, a highly debated subject, and much research both against and in favour of the hypothesis back up further discussions of this subject. Some argue that investor behaviour and other market imperfections drive prices away from their fundamental value, and as such, markets cannot be efficient as proposed by Fama. Pedersen (2015) argues and shows that markets are what he defines "efficiently inefficient", i.e. that markets are to a large extent efficient, but inefficient enough that it is feasible for (some) market participants to engage in market trading and trying to beat the market. The inefficiencies exist primarily because of transaction costs, liquidity risk and funding costs, he states.

Building on the fact that it is indeed difficult to determine the exact level of market efficiency, we believe that markets in general are highly efficient and thus suitable as a survey foundation, while we also acknowledge the imperfections described by some authors (Pedersen, 2015). Our implementation of the event study methodology is primarily based on guidance set forth by MacKinlay (1997).

2.2.2 Estimation period and event windows

In the event study, the first objective is to define the event one wishes to investigate. The event of interest in this thesis is the announcement of acquisitions by listed Nordic companies.

Figure 4: Timeline showing the periods and dates of interest in an event study
Source: MacKinlay (1997)
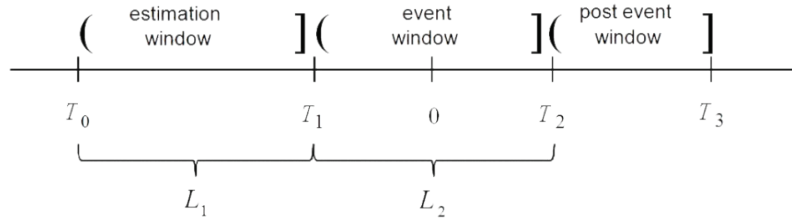
Next is the determination of the period where the study takes place. As laid out in MacKinlay (1997), an event study is generally divided into three periods: 1) the estimation period (L_1); 2) the event window (L_2); and 3) the post-event window.

The event window is the primary period of interest when analysing the returns of the events included in the study, and thus the event window has to include the event date of interest $(t = 0)$. While it is possible to conduct event studies in both the long and short-term, some precaution has to be taken when determining the length of the event window. Usually, the event window is chosen, so it includes days both before and after the event date. In short-term studies where daily data is used, it is common to define the length of the window to include at least one day prior and after the event day and all the way up to around 10 or even 20 days prior and after the event date. Thus, an event with a window (L_2) of two days prior and after the event date is defined as an $(-2; 2)$ event window or five-day event window. The reason for including days both before and after $t = 0$ are several. Firstly, it allows the study to capture pre-leakage of information into the market, which cannot be captured if the event window only corresponds to a single day. Secondly, markets may not react straight away to new information, and thus it is possible that a firm's stock experiences abnormal returns later than on the event date. Finally, it may not always be possible to determine the exact time of the event. Thus, by including several days in the window, one can handle this easily. Despite having double-checked every single event date in our sample, one or two event dates could not be determined with 100% accuracy and as such, it makes sense to increase the event window to multiple days. Overall, it does not seem that one single event period length is agreed upon in the literature reviewed. However, the usual lengths employed are $(-1; 1)$, $(-2; 2)$, $(-5; 5)$ and $(-10; 10)$-day event windows. Some papers further employ non-symmetrical windows (usually more days prior to the event than after), however, this seems to be more occasionally used than symmetrical windows.

For the analysis in this thesis, we employ the $(-2; 2)$ event window as our main range of analysis. Increasing the event window could be doable, but one concern in increasing the length is that other items may interfere with the measurement of the abnormal returns, i.e. the "signal-to-noise" ratio is worsened (Servaes & Zenner, 1996). We will however use the other three window lengths as described above in robustness checks of our analysis.

Next, we turn to the establishment of the estimation window (L_1). In assessing the impact of new information on the abnormal returns, it is necessary to establish a "baseline" of the normal performance for the stock of the firm under investigation. That is, the $E(R_{it})$ part of Equation (1.2) needs to be estimated. This is usually accomplished in the estimation window prior to the event window, and several models for estimating the normal returns are widely employed. The two most widely used models for this are the *constant mean return model* and the *market model*, while several others also exist, including market-adjusted returns (the market model with $\beta = 1$) and other more sophisticated models like the Fama-French 3 Factor model and other factor models.

MacKinlay (1997) advocates for the use of either the constant mean return model or the market model. He argues that the use of the more sophisticated models (economic models, like CAPM, Arbitrage Pricing Theory or the Fama-French factor model) have the ability to improve the accuracy of the estimated normal returns, since these models include factors that can reduce the variance of the predicted returns. Nevertheless, since these models cannot be conducted without certain statistical methods and assumptions too, they impose assumptions that are more restrictive compared to the mean and market model and thus should mainly be considered in certain studies.

Instead, MacKinlay proposes to use either the market model or the constant mean return model, which indeed are the most widely employed techniques in the literature reviewed as well. The constant mean return model is the simplest of all the methods; however, its power proves to be high. In the model let μ_i denote the average return of stock i and define the return of stock i at time t as

$$R_{it} = \mu_i + \epsilon_{it} \tag{2.1}$$

with $E(\epsilon_{it}) = 0$ and $var(\epsilon_{it}) = \sigma_{\epsilon_i}^2$. Consequently, the expected return from the constant mean model becomes

$$E(R_{it}) = \widehat{\mu}_i \tag{2.2}$$

$\widehat{\mu}$ is typically estimated by the average return in the estimation window. Although very simple and intuitive, the model has been shown to perform quite well in event studies. Brown and Warner (1985) even find that returns based on the historical average perform almost as well as the returns predicted by the market model. MacKinlay (1997) attributes this finding to the fact that the marginal gains from employing more sophisticated models usually only add little reduction to the variance of the estimates.

The market model was previously introduced in the section on value measurement and recall from Equation (1.3) that the model is specified as

$$E(R_{it}) = \alpha_i + \beta R_{mt} + \epsilon_i \tag{2.3}$$

with $E(\epsilon_i) = 0$ and $var(\epsilon_i) = \sigma_{\epsilon_i}^2$. The market model thus adjusts for differences in risk between companies by adjusting the expected return according to the beta of the firm's stock with regards to the

market portfolio. This model generally improves upon the constant return model by removing the mentioned risk from the market and consequently reduces the variance of the residuals, allowing for a more precise measure of the effects from e.g. acquisition announcements. As MacKinlay states, the improvement from the market model over the constant return model, is determined by the R^2 of the market model estimation (i.e. the OLS regression applied). For the constant mean model, the underlying assumption is that the mean return is stable over time, while the market model assumes a linear relationship between market and security returns (MacKinlay, 1997). In addition, the market model rests on the general assumptions about ordinary least squares regression.

Having defined the potential models to be used in estimating normal returns, the next step is to define the window over which the model parameters are estimated, called the estimation window (L_1). As with the definition of the event window, it is not agreed upon exactly how long the estimation window should be, but the literature generally agree on overall boundaries for the window length, at least for short-term event studies. In contrary, it is generally agreed that the event window and the estimation window should not overlap, as the variance around the event might increase relatively and thus alter the estimates obtained from the estimation window, if the event window is included therein. While the post-event window can be included in the estimation window in some circumstances, as this may increase robustness in the estimation procedure (MacKinlay, 1997), we proceed not doing so, as we see no signs of other papers doing so in the literature review.

We proceed in this thesis with an estimation window of 240 days prior to the event window(s), that is, we use the event day $t = -250$ to $t = -11$ before the event date $t = 0$. As noted, it is not clear how long this estimation period ought to be. MacKinlay (1997) suggests using at least 120 days, while Bartholdy, Olson and Peare (2007) argue that at least 200 to 250 days prior to the event window are included. The risk of using a long estimation period is that the assumption about stationarity in the mean return or the beta of a firm (when using the market model) vanishes and that as an effect, the linearity assumption about the market relationship is broken. On the other hand, if the estimation period is too short, there may not be enough data available to estimate the parameters of the model correctly, which can be a problem especially on thin traded stocks, as we will demonstrate in the section on thin trading. Further, we see a clear pattern of an estimation window of around 200 to 250 days prior to the event window in the literature review. All the dates mentioned above are event time dates. In calendar time, we set the boundaries for the estimation period to one year, equivalent to 365 days prior to the event date and we further collect data one month after the event date, corresponding to approximately 20 days in event time for thickly traded stocks. As a final note, we set some requirements in regards to the availability of data in the estimation and event periods. We require that at least five observations after the event date $t = 0$ is available. This is because we need enough data within the event window to be able to measure the effects from announcements accurately across several event window lengths. In

addition, we require at least 20 observations in the estimation period. We acknowledge that the limit of 20 days is quite arbitrarily set, as we could not find consensus on what this requirement ought to be. We believe however, that 20 return observations could give a fair estimation of the market model parameters, as long as the frequency of stocks with these characteristics in the sample is minimised. In sum, we identify eight events not meeting these criteria. With four of these already omitted because of other criteria, we proceed with removing an additional four events in the further analysis.

2.2.3 Abnormal return estimation

In the following we will go through the process of estimating the abnormal returns used in our measure of value creation. As already indicated above, we believe the market model to be a good fit in estimating abnormal returns, concerning efficiency and complexity of implementation. Indeed, we also find the market model to be the most widely applied method in our review of previous research. Thus, we proceed with the market model as outlined in MacKinlay (1997) and present some statistical properties of the estimated returns under the assumption of no or very limited thin trading. We do however make a slight adjustment to the estimation procedure as described in the section on thin trading below.

Recall that for the market model, the expected return of stock i is given by Equation (2.3)

$$E(R_{it}) = \alpha_i + \beta R_{mt} + \epsilon_i \tag{2.4}$$

Based on this model, the abnormal return is given by

$$AR_{it} = R_{it} - \hat{\alpha}_i + \hat{\beta}R_{mt} = \epsilon_{it} \tag{2.5}$$

As evident, the abnormal return is equal to the residuals of the market model. The parameters α and β are usually estimated by a simple OLS regression, equivalent to

$$\hat{\beta}_i = \frac{\sum_{t=T_0+1}^{T_1}(R_{it} - \hat{\mu}_i)(R_{mt} - \hat{\mu}_m)}{\sum_{t=T_0+1}^{T_1}(R_{mt} - \hat{\mu}_m)^2} \tag{2.6}$$

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i\hat{\mu}_m \tag{2.7}$$

Thus, since the abnormal returns are given by the residuals, the variance of security i is given by

$$\sigma_{\epsilon_i}^2 = \frac{1}{L_1 - 2}\sum_{t=T_0+1}^{T_1}(AR_{it})^2 \tag{2.8}$$

with L_1 being equal to the estimation window length as described above. Next, the variance for any abnormal return is given by

$$\sigma^2(AR_{it}) = \sigma_{\epsilon_i}^2 + \frac{1}{L_1}\left[1 + \frac{(R_{mt} - \hat{\mu}_m)^2}{\hat{\sigma}_m^2}\right] \tag{2.9}$$

If the distribution of the abnormal returns are assumed normal, then

$$AR_{it} \sim N(0, \sigma^2(AR_{it})) \tag{2.10}$$

Thus, parametric statistical tests can be conducted based on the above (MacKinlay, 1997).

In estimating the parameters of the model, we need an independent variable on which we regress the returns of the securities. Here several options should be considered concerning the measurement of the raw returns and the choice of independent variable. Generally, returns should be adjusted to only reflect pure changes in the market value of companies' equity. More specifically, this means adjusting for stock splits, cash dividends, rights issues and spin-offs (where current shareholders receive stocks in the spin-off company equivalent to the loss in value of the old company), as neither of these, at least in theory, either create or destroy value (future cash flows stay the same). For this reason, we retrieve share prices adjusted for all of the above from Capital IQ, as not doing so would result in potential bias in the return data.

Next, we need a market index to regress the security returns upon to determine the beta coefficient. In choosing the appropriate index, we consider several options. Since our study focuses on the Nordics and consequently multiple countries are involved, we employ a market index from each country. Specifically we use the OMX Copenhagen 20 index for Danish stocks, the OMX Stockholm 30 index for Swedish stocks, the OBX index for Norwegian stocks and the OMX Helsinki 25 for Finnish stocks. All stocks include the 20 to 30 most actively traded stocks in each country. Although none of these indices comprises small-cap securities, we believe them to be a solid choice for measuring market returns. Firstly, all selected indices are viewed as primary benchmarks in their respective countries. Secondly, they serve as good gauges of the overall economy (Bartholdy et al., 2007). Thirdly, since only the most liquid stocks are included, the indices are not prone to thin trading as discussed below, which make them a better choice than all-share indices. One caveat using value-weighted indices like the four above mentioned, is that some firms may represent most of the combined market value of the indices, like Novo Nordisk in Denmark or Statoil in Norway, and thus distort the returns slightly.

As with the security returns, market returns should also be adjusted for dividends etc., i.e. a total return index should be employed. This ensures a 100% equivalent comparison of returns ("apples are compared to apples"). We choose not to do so however. Firstly, data availability of total return indices are not as extensive as pure price return indices and using these indices would result in lost observations of our dataset. Secondly, when looking at relative returns only (i.e. percentages), the difference between total returns and price returns are extremely small. For example, the correlation of the OMX Copenhagen 20 and the total return version of the same was approximately 0.9986 based on daily returns in the period from 2012 through 2017.

Lastly, all returns are logged (using the natural logarithm), as this is desirable in relation to the aggregation of returns described below.

2.2.4 Thin trading

When conducting analyses on a wide selection of different stocks, like the sample in this thesis, certain criteria for data quality have to be fulfilled. More specifically, the main dependency of the event study methodology is that share prices of the firms in the sample are readily available, making it possible to measure the effects of for example M&A announcements with as low margin for error as possible. Thus, if shares are illiquid and traded infrequently, one may have trouble in measuring stock returns efficiently and thus abnormal performance likewise. This is also known as *thin trading* or *infrequent trading* problems. In long-term event studies where weekly, monthly or even yearly returns are utilised, thinly traded stocks are usually not as problematic as when conducting short-term studies based on daily returns. Stocks may still trade infrequently, but only a few stocks trade so infrequently that weekly or monthly returns cannot catch the returns on the stocks. However, when utilising one-day returns as in most short-term event studies, several precautions have to be taken.

Maynes and Rumsey (1993) were among the first to directly acknowledge the problems associated with thin trading and to provide feasible solutions to the problems as well. In their paper, they argue that thin trading may cause problems when forecasting normal performance and problems related to the test statistics used to measure the significance of abnormal performance. The problem of thin trading is avoidable if stocks with missing returns are discarded from the sample, and thus only stocks with thick trading are measured. However, this may not be the best solution, as valuable information may be found in those discarded observations. In addition, it may not be possible to restrict the analysis to such thickly traded stocks only in markets where most stocks are traded infrequently (which might sometimes be the case outside the US, for example). Another measure to counter thin trading is to increase the estimation period of the event study and thus increase the number of available observations. This, however, introduces the risk of violating the stability assumption of the forecasting method, i.e. the beta of the market model has to be constant over time. Instead, Maynes and Rumsey (1993) provide three possible methods to counter missing return data, and namely they propose to alter the way returns are measured and thus how the market model parameters are estimated. These three methods are further acknowledged by Bartholdy et al. (2007), who in addition introduce a fourth method.

The first and simplest technique is to only include returns from days where consecutive prices are available. According to Bartholdy et al. (2007), this method is weak, as it fails to account for information contained in the market and individual stock returns on the rest of the days. The second method is termed the "lumped" return method, under which returns are calculated for all days, but values are assigned to days with price changes only and thus a series of zero-return days are included in the estimation window. This, however, leads to underestimation of the variance and thus biased test statistics. Thirdly, a "uniform" method can be employed. This procedure calculates the return on days where trading takes place and then allocates the average return to the days where no trading takes place. Using this method,

all days in the estimation period have been included, but test statistics are still potentially biased. Maynes and Rumsey (1993) find that the uniform and lumped returns perform almost identically.

According to both papers, the fourth and most appealing procedure to deal with thin trading is the use of trade-to-trade returns. When following this adjustment, returns are measured only on days when actual trading takes place, and thus days in between, where no trading volume is recorded, are excluded (unobserved) in the estimation. This reduces the number of observations available, but since only observable returns are used, and a new time series of returns can be generated, no bias is introduced in the forecasts and test statistics (Bartholdy et al., 2007). Following Maynes and Rumsey (1993) and Bartholdy et al. (2007), we calculate trade-to-trade returns as:

$$R_t = \ln\left[\frac{P_t}{P_{t-n}}\right] = \ln\left[\frac{P_t}{P_{t-1}} \times \frac{P_{t-1}}{P_{t-2}} \times \cdots \times \frac{P_{t-n+1}}{P_{t-n}}\right] \tag{2.11}$$

where R_t is the multi-period return observed on day t, P_t is the price on day t and n is the number of days since the stock last traded. Using the market model, it can be shown that

$$R_t = \alpha n + \beta R_m + \sum_{s=t-n+1}^{t} \varepsilon_s \tag{2.12}$$

in which R_m is the equivalent market trade-to-trade return over the same period. Since the error term is aggregated and dependent on n, it is evident that heteroscedasticity is introduced and thus to correctly estimate the returns, the following estimation model is employed:

$$\frac{1}{\sqrt{n}} R_t = \sqrt{n}\alpha + \beta \frac{1}{\sqrt{n}} R_{mt} + \frac{1}{\sqrt{n}} \sum_{s=t-(n-1)}^{t} \varepsilon_s \tag{2.13}$$

Using the parameters estimated in (2.13), the expected or normal return is given by:

$$E[R_t] = \hat{\alpha}n + \hat{\beta}R_{m,t} \tag{2.14}$$

and thus the abnormal return is given by

$$A_t = R_t - E[R_t] = R_t - \hat{\alpha}n + \hat{\beta}R_{m,t} \tag{2.15}$$

As stated, aggregation of error terms introduces heteroscedasticity, and thus by further dividing with $\sqrt{n}$ the introduced heteroscedasticity is removed in the estimated abnormal returns:

$$A'_t = \frac{A_t}{\sqrt{n}} \tag{2.16}$$

Thus, by applying the above model and corrections to the return series of thinly traded stocks, it is possible to include these in the sample without introducing bias or losing valuable information content from the market.

Since this thesis is situated in the Nordic countries, the findings of Bartholdy et al. (2007) are of extra relevance. They document that about 27% of all Danish stocks were thinly traded in 2001, making the

above-mentioned corrections especially relevant. Above in Figure 5 is a summary of the stocks in the sample used in this thesis. As evident, some level of thin trading is present in the sample with around 8% of the shares being traded on 70% or lower of total trading days. Severe cases of thin trading are almost eliminated in the sampling process, which we believe is primarily attributable to the criterion of deal values must exceed EUR 5 million, thus preventing the smallest and most illiquid stocks from being present in our sample. However, we still choose to correct the remaining stocks in the sample for thin trading by following the approach described above. In fact, it can be shown that as n approaches one (i.e. all returns are available and observed), the trade-to-trade adjustment above becomes the market model as $\sqrt{n} = n, \; n = 1$ and thus Equation (2.12) becomes

$$R_t = \alpha + \beta R_{m,t} + \epsilon_t \tag{2.17}$$

which means that

$$E[R_t] = \hat{\alpha} + \hat{\beta} R_{m,t}, \quad n = 1 \tag{2.18}$$

Thus, the corrections only affect stocks with a high proportion of missing returns, practically leaving a very limited downside.

2.2.5 Return aggregation

To fully utilise the power of the event study method and the estimated abnormal returns, several cumulative and average measures can be constructed to allow for different types of analysis. As a quick overview, we present the four most applied terms below, how to calculate them and the corresponding variances, which can be used for statistical testing.

51

Table 2.5
Abnormal return measures commonly used in event studies

	Single point in time	Multiple periods accumulated over time
Single firm/event	Abnormal return (AR)	Cumulative abnormal return (CAR)
Multiple firms/events	Average abnormal return (AAR)	Cumulative average abnormal return $(CAAR)$

Generally, abnormal returns can be aggregated across two dimensions: across time and/or across firms (MacKinlay, 1997). When analysing the abnormal returns for a single firm from one point in time to another, it is possible to compute the *cumulative* abnormal returns (CAR), i.e.:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it} \tag{2.19}$$

The CAR measure is interesting for several reasons. Firstly, it allows for the analysis of returns over multiple time periods, which is important in regards to capturing e.g. pre-leakage of information into the market, event date uncertainty and slowly reacting markets as explained above. Secondly, the measure is a particularly appropriate choice in conducting analysis based on more than a single independent variable (i.e. multi variable regression analysis in contrary to the event study, which only captures the effect from one variable at a time) on larger samples, which is the second main method used in this thesis. For reasonable lengths of estimation window lengths, the variance of (2.19) is given by

$$\sigma_i^2(t_1, t_2) = (t_2 - t_1 + 1)\sigma_{\varepsilon_i}^2 \tag{2.20}$$

Besides time-aggregation, it is also possible to do cross-sectional averages. The *average* abnormal return and variance (again assuming a large estimation window L_1) for N firms at time t is given by

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \tag{2.21}$$

$$Var(AAR_t) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_{\varepsilon_i}^2 \tag{2.22}$$

Cross-sectional averages at certain points in time are powerful, in the way that they make it possible to analyse large numbers of events/securities at a time. This is useful, as one most often want to analyse general factors influencing a certain population instead of only analysing a single firm. The cross-sectional averages can also help mitigate noise arising from unwanted factors at the time of the event and thus isolate the effect of interest on the dependent variable.

One caveat with cross-sectional averages though that one should have in mind, is the possibility of security returns affecting other securities included in the average. This effect is also known as cross-

correlation of securities or *clustering* in event studies. Assuming no cross-correlation, one can do usual t-tests for significance without much worrying. However, if it is expected that there may be clustering within a sample, and thus cross-correlation of returns, then precaution should be taken. In relation to this thesis and our sample, we discuss the implications and treatment of potential clustering in the section below.

The last aggregation method and possibly the most interesting for the stand-alone event study, is aggregation both across securities (N) and time (t) defined as

$$CAAR(t_1, t_2) = \sum_{t=t_1}^{t_2} AAR_t \tag{2.23}$$

$$Var\big(CAAR(t_1, t_2)\big) = \sum_{t=t_1}^{t_2} Var(AAR_t) \tag{2.24}$$

Alternatively, it is also possible to calculate CAAR as an average of the time-aggregated CARs

$$CAAR(t_1, t_2) = \frac{1}{N} \sum_{i=1}^{N} CAR_i(t_1, t_2) \tag{2.25}$$

$$Var\big(CAAR(t_1, t_2)\big) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_i^2(t_1, t_2) \tag{2.26}$$

As with the AAR calculations, CAAR rests on the assumption that events are uncorrelated (i.e. no clustering) so that when calculating the CAAR variance, covariance between securities can be ignored. In that case, the usual t-test statistics can be calculated without further precautions. However, if cross-correlation is expected, precautions and possibly alternative test methods should be employed, as discussed below. As we proceed with using a variety of test statistics, we present these, their properties and associated assumptions in a separate section below.

2.2.6 Clustering

Besides thin trading, another issue that may interfere with the results of an event study is *clustering* (MacKinlay, 1997). Clustering in event studies happens when event windows across firms overlap which poses a problem for statistical inferencing. It can intuitively be seen that when one firm announces an acquisition, this new information could have an effect on competitors or similar, driving their stock in either direction. This could in turn affect the return of the market used in the calculation of the abnormal returns in an event study. When returns are aggregated across time, and event windows consequently increases, this issue is worsened. In most event studies, it is common to assume that since event windows do not overlap, the covariance, or cross-correlation, between securities can be disregarded in terms of statistical testing. However, when events do overlap it might not be appropriate to assume that covariance between securities is irrelevant. Put differently, inclusion of overlapping events might introduce cross-sectional dependence, which in turn could mean underestimation of the

variance of securities, leading to misspecified test statistics and systematic rejection of the hypothesis (Brown & Warner, 1985). However, misspecification is not always a problem according to Brown and Warner (1985). They argue that, when cross-sectional dependence is small as in studies with non-overlapping events, ignoring the dependence term in test statistics, only introduces little bias. Thus, introducing a dependence adjustment may be harmful, compared to the assumption of independence.

In Table 2.6 below, we present an overview of event overlaps in our sample. As evident, there may be some cross-correlation in the sample, although not of any serious kind. The table shows how many events in our main $(-2; 2)$ event window which overlap by one day or more. There is also evidence of a few total clustered events (events with same event date). We believe that the effects of cross-correlation of security returns are biggest when events are within either the same country or the same industry (sector) (Bernard, 1987). This is intuitive, as either increases the relatedness of two given companies, ceteris paribus. In the cross-sectional regression analysis of CARs, which we employ later on, we can control for industry effects to some extent, by using fixed effects controls. However, in the event study analysis clustering might still pose a problem for results interpretation.

Some actions can be taken to accommodate the possibility of cross-sectional dependence in residuals. MacKinlay (1997) mentions two often-used methods in event studies to handle event clustering. The first is the portfolio method and the second is to use unaggregated security-by-security returns. In the portfolio method, firms are aggregated into portfolios dated using event time. This procedure enables the analysis of the returns in an aggregated form on which variance without cross-sectional dependence can be estimated and hypotheses be tested. The downside to this method though is that information is lost in the process, as events or firms are practically combined and treated as a single event/firm, thus not providing the full information of each event.

The second method is to not cumulate returns and is typically employed when total clustering is encountered (MacKinlay, 1997). The favourable moment of this method is that it can accommodate an

Table 2.6
Number of events clustered in both sectors and country

This table presents the number of events in our sample with one or more days overlapping within our main five-day event window. Events are tabulated by the 11 GICS sectors and further by country. Sectors with no overlapping events are not shown in the table.

	Consumer Discretionary	Industrials	Information Technology	Clustered events in country within same sector
Denmark	0	0	0	0
Finland	0	2	0	2
Norway	0	0	0	0
Sweden	4	8	4	16
Clustered events in sector within same country	4	10	4	18

alternative hypothesis where some firms have positive returns, while others have negative returns, which the portfolio method cannot do. The method has two main drawbacks including that test statistics will have little power compared to other more economically reasonable methods.

There are other less conservative or drastic approaches, which can be employed to cope with cross-sectional dependence. Of course, it is possible to just drop all overlapping events (or half of them), however this could introduce non-random sampling bias. For example, as noted under the literature review, the frequency of acquisitions tend to concentrate heavily within merger waves, thus increasing the probability of event clustering. Consequently, if clustered events within merger waves are omitted, non-random sampling is introduced and results will be biased, as more weight on "non-merger wave" events is emphasised.

Lastly, it is possible to adjust test statistics to accommodate cross-sectional dependence and thus event clustering. Since we believe the sample employed in this thesis is not heavily influenced by event clustering, we will not employ any of the first three mentioned procedures. Instead, we employ an additional parametric test statistic, which we will elaborate on further in the section below.

2.2.7 Tests of significance

To analyse the statistical significance of our findings and further validate the event study results, we employ a set of different test statistics of both parametric and nonparametric nature, as suggested by e.g. Bartholdy et al. (2007) and MacKinlay (1997). Below we present three different test statistics, their assumptions and strengths and weaknesses. The first two of those are parametric tests. More specifically, we use a classic simple t-test as described in MacKinlay (1997) and secondly we employ an adjusted version of the Boehmer, Masumeci and Poulsen (1991), or BMP, test. The third test applied is nonparametric and corresponds to the rank test proposed by Corrado and Zivney (1992).

The need for different test statistics is mainly a consequence of the assumptions underlying each test and possible problems encountered in the data (Bartholdy et al., 2007). Thus, to make informed decisions about significance and increase validity of the event study results, a set of statistics with different assumptions are needed based on the properties and beliefs about the underlying distribution of the sample share prices.

2.2.7.1 Classic t-test

In most event studies, the first and most widely applied test statistic is a parametric common t-test of abnormal returns being different from zero. MacKinlay (1997) formulates the test statistic as

$$T_1 = \frac{CAAR(t_1, t_2)}{\sqrt{Var\big(CAAR(t_1, t_2)\big)}} \tag{2.27}$$

with the parameters defined as in Equations (2.23) and (2.24) and T_1 being the test statistic. Under the null hypothesis, this statistic is normally distributed with a 0 mean and 1 variance, i.e. $T_1 \sim N(0,1)$.

The test is simple and interpretation is generally easy. It rests however on a series of strong assumptions that may be violated even in large samples. As with all parametric tests, the t-test assumes a specific distribution of the abnormal returns, and specifically normality in abnormal returns are the premise on which the test builds (MacKinlay, 1997). This is a strong assumption that underlies all the parametric tests, and especially when using daily return data, returns may depart substantially from this assumption, i.e. there is skewness in the distribution (Brown & Warner, 1985). Next, the test requires fulfilment of two conditions, which are quite debateable too. Firstly, the simple t-test requires that there are no cross-correlation in abnormal returns across securities (MacKinlay, 1997). This is a strong assumption, since we cannot rule out this risk within the sample as discussed above, and thus the risk of cross-correlation of security abnormal returns is present.

Secondly, it is also documented, that besides changes in abnormal returns on or around the event day, it is likewise possible that the variance of the security changes on the event day or around the event (Bartholdy et al., 2007; MacKinlay, 1997). This is also known as *event-induced volatility*. The risk of the firm can change for several reasons, including that the announcement of an acquisition may increase systematic risk (i.e. the beta of the firm) or that investors need time to process new information regarding the acquisition (i.e. issues related to behavioural finance theory).

Ignoring the effects of either of the above may result in systematic underestimation of the variance and thus erroneous rejection of the hypotheses. However, adjustment of the test statistics to accommodate these conditions is possible, as shown in the following.

2.2.7.2 Adjusted BMP test

In relation to the aforementioned problems with event-induced volatility, MacKinlay (1997) and Bartholdy et al. (2007) refer to the test statistic developed by Boehmer et al. (1991). The BMP test was designed to handle this induced volatility, by combining the results from previous research concerned with the consequences of increased volatility around the event. More specifically, Boehmer et al. (1991) use what they term a "hybrid" version of two other methods used in estimating the variance applied in the test statistic, namely a cross-sectional estimation of the event window variance and further a standardisation of abnormal returns. Firstly, the use of a cross-sectional estimation of the test statistic variance ignores the estimation period residual variance and uses only the variance across securities within the event window period, which is desirable. In previous studies using this method, it has been shown that variance in the event period was higher than in the estimation period (Boehmer et al., 1991). An example of a cross-sectional variance estimator for CAARs is shown by Equation (21) in MacKinlay (1997). Next, application of standardised residuals serves two purposes according to Boehmer et al. (1991). Firstly, it accounts for the higher variance introduced in the event period residuals, as these are out-of-sample estimates (i.e. based on the estimates from the market model

parameters and thus estimation errors are introduced), and secondly, it allows for heteroscedasticity in event-period residuals, resulting in more weight is put on securities with low variances.

The standardised abnormal returns are given by

$$A_{it}^{As} = \frac{A'_{it}}{S^A(A_{it})} \tag{2.28}$$

where the standard deviation of A_{it} is given by

$$S^A(A_{it}) = \sqrt{\frac{1}{T_i - 1} \sum_{t=1}^{T_i} [A_{it}]^2 \left(1 + \frac{1}{T_i} + \frac{(R_{m,0} - \overline{R}_m)^2}{\sum_t^{T_i} (R_{m,t} - \overline{\overline{R}}_m)^2}\right)} \tag{2.29}$$

Thus, using the standardised residuals, the test statistic can be formulated using the cross-sectional method found in MacKinlay (1997), Equation (21), as

$$T_{BMP} = \frac{SCAAR(t_1, t_2)}{\sqrt{\frac{1}{N^2} \sum_{i=1}^{N} [SCAR_i(t_1, t_2) - SCAAR(t_1, t_2)]^2}} \tag{2.30}$$

where $SCAR$ and $SCAAR$ are the standardised versions of Equation (2.19) and (2.23) within this thesis, respectively.

Finally, Kolari and Pynnönen (2010) show that a correction for cross-correlation of abnormal returns is possible using an estimate of the sample average cross-correlation, formulated as

$$T_2 = T_{BMP} \times \sqrt{\frac{1 - \bar{r}}{1 + (N - 1)\bar{r}}} \tag{2.31}$$

where $\bar{r}$ is the estimated average cross-correlation of the sample in the estimation period (hereafter the termed the Kolari test).

2.2.7.3 Corrado rank test

Despite the above test being able to adjust for several problems encountered in the data at once, it still rests on the same assumption as a simple t-test, namely that the distribution of abnormal returns are normal. However, this is, as already mentioned, not always the case with return data, even in large samples. Thus, to circumvent problems with basing tests on normality assumptions, several non-parametric tests have been suggested as alternatives. These tests do not require any knowledge or assumptions about return distributions, but only information about the mean (MacKinlay, 1997). Generally does nonparametric tests nor parametric tests provide more powerful results across all scenarios, but instead both groups should be used in conjunction as argued by several authors (Bartholdy et al., 2007; MacKinlay, 1997).

In this thesis we employ the rank test suggested by Corrado (1989), later refined by Corrado and Zivney (1992) to accommodate missing returns (thin trading). Other nonparametric tests include the sign test (and derivations thereof), however this test has been found to be weak when return distributions

are skewed, which the rank test is not prone to (Corrado, 1989; MacKinlay, 1997). The test statistic can be formulated as

$$T_3 = \sum_{t=t_1}^{t_2} \frac{\left(\frac{1}{\sqrt{N_t}}\right) \sum_{j=1}^{N} \left(U_{jt} - \frac{1}{2}\right)}{\sqrt{t_2 - t_1} S(K)} \qquad (2.32)$$

where t_1 and t_2 represents the start and ending of the event window, N represents the number of non-missing returns across the firms in the sample and U represents the ranks of the abnormal returns in the estimation and event window, standardised by the number of non-missing returns over the entire period. The standard deviation $S(K)$ is estimated from the ranks of the entire sample of N firms in both the estimation and event period, and is thus not dependent on the underlying return distribution. The test statistic follows a standard normal distribution, i.e. $T_3 \sim N(0,1)$ (MacKinlay, 1997).

Instead of using the abnormal returns for testing, each return is ranked by value from the first day in the estimation period to the last day in the event window, with the lowest value ranked 1 and the highest return ranked by the number of returns in the entire period. Substituting the ranks for the abnormal returns of the parametric tests has the advantage of transforming the distribution of returns into a uniform distribution. This solves the normality dependency, thus allowing for inferencing without this assumption. The downside of this method however, is that if the normality and other assumptions of the parametric tests do in fact hold, valuable information is lost in discarding the usual calculation of standard deviations.

2.3 Regression analysis

The second method we apply in analysing the value creation effects of acquisition announcements is a traditional cross-sectional multiple linear regression analysis of the CARs obtained from the event study. The concept of combining the event study with a regression analysis is quite common and recur in practically all the literature reviewed. MacKinlay (1997) also advocates for the use of a cross-sectional regression analysis, as this can enhance the insights into what drives the abnormal returns effect. In other words, regressions help us in testing several hypotheses regarding value creation by allowing for multiple event, deal and firm specific characteristics to be controlled for at the same time, which the event study method cannot do.

The basic approach laid out by MacKinlay, is to use the (cumulative) abnormal returns for each event as the dependent variable and then run an OLS regression on the corresponding firm, deal and event specific characteristics and other economic variables of interest. Thus, since we use the $(-2; 2)$ window as our main range, this will be our primary dependent variable and the model that has to be estimated is

$$CAR_j = \beta_0 + \beta_1 x_{1j} + \cdots + \beta_M x_{Mj} + \varepsilon_j \qquad (2.33)$$

where $E(\varepsilon_j) = 0$. In this model, $\beta_0, \ldots, \beta_m$ are the estimated parameters for the M characteristics that one wishes to investigate the effects of for the j events.

In our analysis, we employ a different regression model of the cumulative abnormal returns, in every section outlined in the literature review. In doing so, we use two sets of independent variables. Firstly, we define the *variable(s) of interest* within each section of the thesis. These are allowed to change from each portion of the thesis, as they are the variables we are interested in knowing the effect of. Thus, in the analysis section below, we define each variable of interest based on the theory and literature previously discussed. Next, we employ a set of control variables used throughout the entire thesis. These variables are the same in each section, as we are not directly interested in the effects from these, but only interested in controlling for the (cumulative) effects these variables may have on abnormal returns.

The general OLS assumptions underlying a correctly specified regression analysis are: 1) the expected value of the conditional error term is zero; 2) independently and identically distributed pairs of dependent and independent variables; 3) large outliers are rare; 4) the error term is homoscedastic; and 5) the conditional error term is distributed normal. These assumptions are termed the extended least squares assumptions by Stock and Watson (2015). As noted in the delimitation section of the thesis, we do not concern ourselves with the overall fulfilment of these assumptions. However, we do note and make an adjustment regarding the assumption of a homoscedastic error term. As MacKinlay points out, "there is no reason to expect the residuals […] to be homoscedastic" (1997, p. 33) and the previous research mostly do use adjusted error terms in regressions. Thus, we make use of Whites heteroscedastic robust standard errors as suggested by MacKinlay (1997) in all of our regressions.

2.3.1 Control variables

The control variables presented below are proved by several studies to affect bidder returns. Following, all variables will be defined and assessed in terms of our expectations for the effect on bidder return.

2.3.1.1 Firm size

In a previous study, Moeller et al. (2004) found a significant difference in abnormal returns based on acquisitions made by small and large firms. The study showed that small firms made profitable acquisitions of other small firms, resulting in small dollar gains. However, large firms that made acquisitions of other large firms resulted in significant dollar losses. Thus, they have concluded that acquisitions result in negative bidder returns, as losses from large firm acquisitions exceed minor gains from small firm acquisitions. Moeller et al. (2004) also found that the size effect is robust, as it holds for all their three analyses with no proof of the effect is reversed in the period. The reasons for the size effect are for example empire building and the fact that large companies make tender offers with larger acquisition premiums compared to small companies, resulting in negative gains.

Gorton, Kahl and Rosen (2009) also found that firm size, measured as log of market capitalisation, affects the bidder return in acquisitions. Their study showed that the firm size distribution in the industry is a central factor for potential acquisitions due to managers' different attitudes towards private benefits of control. They found that industries where a large group of companies have the same size compared to other companies, acquisitions are likely to happen, since a mix of private benefits tends to appear. We expect that firm size will be negatively related to bidder return.

2.3.1.2 Relative size

This variable measures target size relatively to bidder size. Mulherin and Boone (2000) found that both target and bidder returns are significantly related to the relative size between target and bidder (defined as target deal value divided by bidder market capitalisation). Furthermore, they show that wealth effects are persistent with synergistic explanations in terms of the acquisitions. Later, Fuller et al. (2002) found bidder returns to be negatively related to the target size relative to bidder size in public acquisitions. Conversely, they found the opposite relation for the private and subsidiary targets where bidder returns are positively related to the target size relative to bidder size. They explain the differences in bidder returns, related to public and non-public transactions, to be caused by the differences in the division of gains and synergies in acquisitions of public and private companies. These differences are further enlarged when the relative target size increases. Since the number of listed targets in this study is minimal, we expect that relative size will be positively related to bidder return.

2.3.1.3 Insider ownership

The variable insider ownership measures the internal ownership stakes in the company, e.g. management's ownership stakes through incentivised payment schemes. Jensen and Meckling (1976) developed a new ownership structure theory based on previous theories of principal-agent relationship, financing and property rights. Their new theory found a noteworthy relationship between agency costs and the existence of equity from outside the company (external shareholders) and company debt. In other words, their study indicated that inside ownership could be an element to reduce agency costs, e.g. management decisions favouring their own interests instead of the shareholders.

Doukas and Holmen (2000) examined 93 risk-reducing acquisitions in Sweden from 1980 to 1995 to observe whether there was a relationship between bidder returns and management ownership. When managers have ownership stakes, they found that the company is less likely to engage in diversifying acquisitions that would lead to lower shareholder wealth. Furthermore, they prove that companies making risk-reducing acquisitions create shareholder value, when management has equity stakes in the company. An explanation could be that managers tend to make more thorough identifications of corporate gains before engaging in acquisitions, when they own equity stakes in the company.

Later, S. Datta, Iskandar-Datta and Raman (2001) found a significant positive relation between the share price performance after acquisition announcement and management's equity-based compensation.

In addition, managers with high equity-based compensation packages made acquisitions of high-growth target companies and paid lower premiums. The result was considered robust when controlling for payment method, acquisition type, management ownership and related option grants. We expect that insider ownership will be positively related to bidder return.

2.3.1.4 Leverage

As addressed above, Jensen (1986) stated the free cash flow hypothesis related to a payout policy and capital structure perspective. Based on his study, he argues that debt should be used to incentivise and discipline the management that is considering investments, which could lead to value-destroying outcomes. For example, if managers have excess cash due to a low debt/equity ratio, they will be more likely to engage in projects with negative NPVs, e.g. acquisitions of companies resulting in negative returns. Maloney, McCormick and Mitchell (1993) agreed with Jensen's (1986) findings that capital structure can be used to control agency costs. They found a positive relationship between bidder returns at merger/acquisition announcement and the leverage of the bidder company.

Later, Golubov et al. (2015) found leverage to have a significant effect on bidder returns where leverage is measured as the sum of the acquiring firm's long-term debt and short-term debt divided by the market value of its total assets measured at the end of the financial year prior to the acquisition. We expect that leverage defined as the debt-to-equity ratio will be positively related to bidder return.

2.3.1.5 Sigma

Sigma (the volatility of the acquirer's stock) is a variable known to have an effect on the bidder CAR.

Moeller, Schlingemann and Stulz (2007) assess the relationship between bidder abnormal returns in acquisitions and volatility, which in their studies is used as a proxy for information asymmetry between owners. Thus, they argue that volatility of a bidder's stock can be used to measure differences in opinions, and consequently as information asymmetry and differences in opinions increase, so does volatility leading to decreased CARs. They find that, in general, the coefficient of sigma in relation to CAR is negative (not statistically significant), but when paired with control variables for target company type (public or private) and payment method (equity or cash), they find the opposite. When private acquisitions are settled with equity or when public acquisitions are paid with cash, they find the volatility of the bidder's stock to be positive and highly significant.

Golubov et al. (2015) study the effect of frequent acquisitions on the acquirer's CAR. They include the sigma of the acquirer's stock in the 200-day estimation period prior to the event window, and generally find a positive relationship between the abnormal performance and volatility. Acquisitions in general and in acquisitions by occasional acquirers (non-frequent), they find the effect of sigma to be positive and significant, however, when frequent acquirers are measured, they do not find statistical significance, although still with a positive effect.

We will include sigma of acquirer's stock as a control variable in the regression analysis and generally expect a positive effect on bidder CARs. The previous authors commonly use market-adjusted sigma, which means only idiosyncratic volatility is measured, and we proceed to do so as well. We do make some minor adjustments in the measurement. We use the market-adjusted returns from the estimation window of the event study, resulting in 240 observations at most (from event time -250 to -11). As mentioned above, some of the stocks in the sample suffer from thin trading effects, and thus to catch the effect of this on sigma, we use Equation (9) in Maynes and Rumsey (1993) to correct this:

$$S(A_i) = \sqrt{\frac{1}{T_i} \sum_{t=1}^{T_i} \left[\frac{A_{it}}{\sqrt{n_t}} \right]^2} \tag{2.34}$$

where T_i is the number of trade-to-trade returns for stock i in the estimation period and n_t is the number of days between each trade-to-trade return observation, as in Equation (2.16) within this paper.

2.3.1.6 Listed targets

As stated above, Fuller et al. (2002) found bidder returns to be negatively related to the target size relative to bidder size in public acquisitions. Conversely, they found the opposite relation for the private and subsidiary targets. They give several explanations of this listing effect, e.g. management of private companies may also be the founders and may want to sell due to market competition or their aim to cash out. This leads to a potential weakened bargaining position for target reducing the acquisition premium. Faccio et al. (2006) further examined the CARs when acquiring listed and unlisted targets. They found evidence related to Fuller et al. (2002), where companies acquiring unlisted targets achieved significant bidder returns of 1.48% on average. Conversely, companies acquiring listed targets achieved insignificant bidder returns of -0.38% on average. This negative listing effect on bidder returns remains throughout the sample during the whole period, also when controlling for payment method, bidder size, Tobin's Q and other relevant characteristics. We expect that acquisitions of listed targets will be negatively related to bidder returns.

2.3.1.7 Run-up

Run-up is a variable controlling for the development in bidder's stock price in the period up to the announcement date of the transaction. Rosen (2006) found statistically significant evidence of run-up affecting bidder return (CAR) when acquiring firms. Moreover, he proved that run-up in stock price is negatively related to bidder returns.

Another interesting fact is the difference during a short-term and long-term period. In the short-term, if the stock market is trading at a high level due to good economic times, or if M&A activity is being well received by shareholders due to a hot merger market, the probability of a positive development in bidder's stock price increases when an acquisition or merger is announced. Conversely, Rosen (2006)

found the opposite relation in the long-term, where bidder returns are lower for companies making acquisitions when stock markets or the M&A market are hot compared to other acquisitions.

Golubov et al. (2012) found similar evidence during their examination. They used the same approach to run-up measurement as Rosen (2006) and found significant effect at a 1% level, that run-up is negatively related to bidder returns.

We use the same definition as the previous authors, where we define run-up as the market-adjusted buy-and-hold return of bidder's stock over a 240-day window (Golubov et al., 2015; Rosen, 2006):

$$BHAR = \frac{\prod_{t=T_0}^{T_1}(1 + R_t)}{\prod_{t=T_0}^{T_1}(1 + R_{m,t})} \tag{2.35}$$

2.3.1.8 Fixed effects – year and sector

In addition to the deal and firm-specific control variables, general macroeconomic and other unobserved conditions need to be addressed as well. By adding fixed effects controls to the regression model, we are able to control for the influence from other variables that vary across our sample, in our case through time and between industries. More specifically, fixed effects are used to analyse the relationship between the characteristics of entities and the predictor variables and the impact these characterises have on these variables (Torres-Reyna, 2007). When applying fixed effects, we assume that some of the entities' characteristics may bias or have an influence on variables. For that reason, it is important to control for these bias risks where fixed effects eliminate the impact from time-invariant characteristic. Thus, we are able to evaluate the net effect generated by the predictor variables (Torres-Reyna, 2007). Xu (2017) states that fixed effects have a noteworthy impact on the M&A activity based on a study of approximately 10,000 deals made by firms across the world. To control for unobservable year-specific events and heterogeneity not varying over time, this paper includes fixed effect variables in the regression analyses (Xu, 2017). Furthermore, the industry variable also enables the study to control for different returns and trends across industries, e.g. Information Technology compared to Utilities. Thus, dummies for years and industries, classified by the two-digit GICS codes, have been included with reference to previous studies (Faccio et al., 2006; Goergen & Renneboog, 2004; Golubov et al., 2012; Xu, 2017).

3   Results and analysis

3.1   Overall event study results

In this section, we present the overall results from the event study, on which the rest of the analyses will be based upon. We analyse and discuss the statistical significance of our findings, and further explain all additional methodological steps and choices made, not already presented in the section above.

As mentioned in the event study methodology part, we focus mainly on the five-day event window, denoted as the $(-2; 2)$ window. While we keep this window length as the focal period of interest, we also calculate and present our findings for the three $(-1; 1)$, eleven $(-5; 5)$ and 21 $(-10; 10)$ day event windows. The purpose of this is to increase the validity of our results by showing the robustness of the estimated abnormal returns across several timespans, as noise of varying levels may be present in either window. The use of multiple event windows also permits us to further put our findings in context to other research not applying the $(-2; 2)$ window length. For all individual area of interest that we outline and present hypotheses for in the literature review section, we present plots of the cumulative abnormal returns (in the following denoted CAAR plots), CAAR results and related test statistics and further apply regression analysis if applicable. Within this first part concerning overall analysis of the event study, we also present average abnormal return results for each day in the $(-10; 10)$ window, as this permits an in-depth analysis of where and when potential value is created.

Taking a first look at the CAAR plot in Figure 6 below, we see several interesting effects on the overall bidder value creation in our sample. The day zero (the event date $t = 0$) clearly exhibits a mentionable level of positive abnormal return compared to the other days in the 21-day period in the graph. The jump in CAAR is from around 0.2% to 1.4%, indicating an abnormal return on the event day of around 1.2%. From day -10 in event time until day -2 the pattern of abnormal returns does not show any noteworthy effects or trends and the CAAR in this period is very close to zero as expected. However, on the day before the event date $(t = -1)$, the average abnormal return takes a small jump from around 0% to around 0.2%. Interpreting this effect is not straightforward, as it could mean one or several things. Firstly, as already discussed is the possibility of pre-leakage of information from either the target or bidding company into the market. Thus, investors might expect the announcement and consequently react to this new information before the acquisition even is announced, indicating that the market is efficient to some degree. Secondly, as also touched upon earlier, there might be some event date uncertainty represented in the data. While we believe this effect is close to fully mitigated by the manual review and confirmation of all event dates in the sample, for less than a handful of the events it was not possible to determine the exact date, but only a tight date range. Consequently, there might exist insignificant noise in the data, however we believe this to be insignificantly small.

Figure 6. CAAR plot of the overall event study results
Source: Own creation
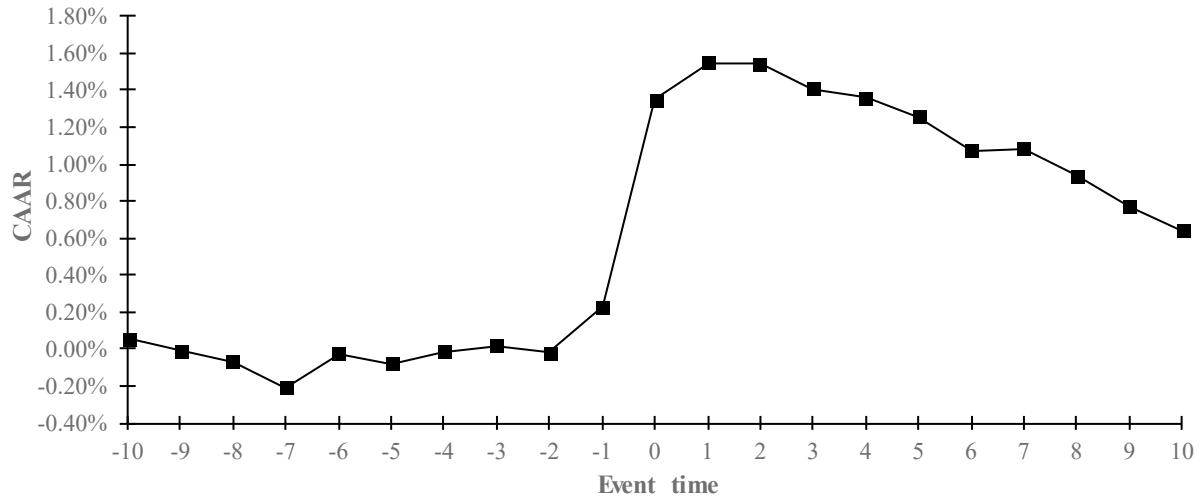
On the date following the event day $(t = 1)$, the graph also shows a noteworthy jump in the CAAR from around 1.4% to 1.6%. While the same argument about event date uncertainty and noise in the data can be made about effects on the day following the event, the argument of pre-leakage cannot. Neither is the effect exhibited on the following day necessarily a consequent of inefficient markets, although this could be true, in theory. Instead, we believe this effect should be interpreted as a consequence of behavioural finance related matters. As Bartholdy et al. (2007) point out, investors need time to process new information and set the new pricing level of the given stock. As such, it is possible that for some stocks (one could probably put forward a hypothesis that the phenomenon is more severe in cases of thin trading) the effect of an acquisition announcement may be delayed and show up in the stock price one or several days later. Thus, concluding on this is difficult without further investigation into what drives this delayed return effect.

If the downwards trend starting at the second day after the event day is also explainable by behavioural finance theories, is probably more of a guess. Regardless, the strong negative cumulative abnormal returns following the event are somewhat surprising. If not related to behavioural matters, a more stable pattern with as good as no trend should be exhibited (as is the case before the event). This is however, not the case. Based on the finding presented here, it is hard to draw any solid conclusions on why this trend is experienced. As such, a more in-depth analysis of the post-event window should be employed to analyse this effect, however we choose not to proceed with this, since we want to keep our focus directed towards the shorter event windows.

In Panel B of Table 3.1, we investigate the numbers behind the CAAR plot. In the table, we display the event time, the average abnormal returns, the number of events included at the specific time and the

three tests outlined in the method section[4]. The main effect on abnormal returns is visible on the event day itself as expected. The table reveals that on the event day itself, an abnormal return of 1.12% is experienced across the sample and all test statistics show that this return is highly significant different from zero at a 1% level. The difference between and need for multiple test methods are quite clear looking at the absolute levels of the statistics. The Kolari test, adjusted for cross-correlation and event induced volatility, is almost halved compared to the regular t-test while still highly significant, with the non-parametric rank test falling in between. Both the day prior and following the event day also show significant positive abnormal returns with 0.25% and 0.2% respectively. Both days returns are statistically significant at 5% alpha across all tests, except the t-test for day $t = 1$, which is significant at a 10% level. The remaining days in the 21-day event window generally do not show any signs of significant abnormal returns. Exempt though, are the days $t = -6$ and $t = 6$, which is quite surprising as we generally have no reason to expect these returns to be abnormal. Both days are only significant at the 10% level and in either case does the Kolari test not exhibit any signs of significance. Consequently, we are cautious on concluding that these abnormal returns are in fact abnormal, and instead we believe these to be influenced by noise not accounted for in the sampling and methodological procedure. Overall, it is clear that the abnormal returns are generated on and close to the event day, as expected.

When the AARs from Panel B in Table 3.1 are aggregated over time, the result is the CAARs in Panel A. The CAAR is the overall measure for some time period across the entire sample and thus serves as the primary measure of value creation within this thesis. As previously mentioned, we focus mainly on the $(-2; 2)$ period (hereafter the main or primary window), but including and comparing this period to the other window lengths is important as well. Given this statement, we observe a CAAR for the total sample of 1.54% in the primary window. This result is highly significant different from zero with only minor variance in the test statistics, indicating that the result is significant well beyond the 1% level. Thus, on average the companies in the sample, increase shareholder value by an abnormal value of 1.54% in the five days around the event announcement. The result is close to equal when considering the $(-1; 1)$ event window, as only a minor increase in the CAAR is exhibited and the tests for the three-day event window are all highly significant at the 1% level as well. The 11-day window shows a slightly lower CAAR at 1.34%, but all tests are still significant at the 1% level. Thus, the companies investigated

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[4] Looking at the number of observations in the CAAR tables presented here and below, compared with the number of observations described in the data description and sampling section, some discrepancy is evident. The number of firms included in calculating AARs and CAARs is lower than the total number of firms in the sample and the reason behind is twofold. Firstly, some firms are very thinly traded and the consequence of this is that return data might be missing in the event period, even on the event day itself in some cases. Thus, AAR calculations generally have a lower number of securities included, with the number of available returns generally decreasing as the time distance to the event day increases. Secondly, since we use trade-to-trade returns to account for thin trading effects, returns are defined as in Equation (2.11)

$$R_t = \ln\left[\frac{P_t}{P_{t-n}}\right] = \ln\left[\frac{P_t}{P_{t-1}} \times \frac{P_{t-1}}{P_{t-2}} \times \cdots \times \frac{P_{t-n+1}}{P_{t-n}}\right]$$

This shows that some returns may be compounded returns from multiple days, if the stock did not trade in the days prior to an observation. Thus, although these prior returns are zero and unobserved, it would not be theoretically correct to include the observation in the CAAR calculation, as it would expand the period over which returns are aggregated.

in our sample creates abnormal returns even over an 11-day period. The picture changes somewhat, when considering the 21-day period. In this window, a noticeable decrease in CAAR to 0.45% is evident and all tests statistics drop well below the critical value for the two parametric tests. This is in line with what was exhibited from the CAR plot above, and it is clear that the substantial negative trend following the event day is the driver behind the decrease in CAAR. The rank test still shows statistical significance, but only at a 10% level. This is interesting, since neither of the two parametric tests is close to the 10% critical value, which could point to the fact that there may be issues concerning non-normality in the distribution of the abnormal returns when considering longer event windows. While the CAAR for the 21-day window is still positive, we find it hard to conclude that there is evidence of value creation when moving beyond the $(-5; 5)$ window, since the test statistics presented here are quite clear on this matter.

Table 3.1
CAAR and AAR results of the overall event study

Significance level indication: 1% - ***, 5% - **, 10% - *

Panel A: Overall event study results – CAARs					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.58%	603	8.442***	6.750***	7.180***
(-2;2)	1.54%	586	6.293***	5.083***	5.434***
(-5;5)	1.34%	596	3.766***	2.802***	3.289***
(-10;10)	0.45%	584	0.869	1.199	1.794*
Panel B: Overall event study results – AARs					
Event time	**AAR**	**N**	**t-test**	**Kolari test**	**Rank test**
-10	0.058%	599	0.533	0.546	0.273
-9	-0.068%	600	-0.623	-0.251	-0.823
-8	-0.060%	608	-0.560	-0.085	0.094
-7	-0.137%	603	-1.262	-1.370	-1.110
-6	0.179%	611	1.675*	1.548	1.935*
-5	-0.052%	598	-0.479	-0.314	-0.021
-4	0.065%	596	0.598	0.060	-0.214
-3	0.034%	603	0.318	-0.019	0.511
-2	-0.041%	609	-0.377	-0.050	-0.057
-1	0.248%	604	2.293**	2.030**	2.445**
0	1.121%	617	10.548***	5.825***	8.075***
1	0.196%	613	1.844*	2.387**	2.288**
2	-0.003%	605	-0.024	-0.546	-0.112
3	-0.134%	605	-1.239	-0.163	-0.150
4	-0.051%	609	-0.475	-0.437	-0.434
5	-0.104%	609	-0.975	-1.284	-1.479
6	-0.181%	609	-1.684*	-0.772	-0.793
7	0.011%	606	0.099	0.218	0.023
8	-0.146%	606	-1.353	-1.371	-0.538
9	-0.165%	599	-1.520	-1.451	-0.886
10	-0.130%	602	-1.201	-0.109	0.437

3.2 Cash flow and investment opportunities

In this part of the analysis, we test the effect from bidder cash flow and investment opportunities in six different regression models. For this section only, we exclude deals involving banks and other similar financial institutions due to their different definitions of cash flows, which make them inapplicable for this part of the analysis. We now test our cash flow related findings in a cross-sectional multiple regression analysis to determine whether we have sufficient evidence for our stated cash flow hypotheses. The first hypothesis is based on Jensen's findings (1986) about management seeing financial resources as a source of power. Furthermore, when the company has a high FCF, external financing may not be necessary leading to less requirement for management in terms of justifying M&A activity. Also, Jensen (1986) and Murphy (1985) found a strong correlation between company growth and both management compensation and power, resulting in strong motivations among managers to engage in acquisitions to quickly increase company growth and size. In relation to Jensen's well-known hypothesis, we initially stated the following hypothesis:

H_1: *High bidder cash flow will affect bidder abnormal returns negatively*

Following Lang et al. (1991), we test two different cash flow measures, namely cash flow calculated as operating income before depreciation minus interest expense, taxes (cash and change in deferred taxes) and preferred and common dividends (hereafter Cash Flow proxy). Furthermore, to increase robustness, we also test cash flow from operations as reported by the companies themselves in their cash flow statements (Lang et al., 1991) (hereafter CFO). Both cash flow measures are normalised by book value of assets (BVoA) measured at the latest full year financial report prior to the event.

Below in Table 3.2, we estimate six different regressions models, based on the five-day event window, where model (1) and (4) will be discussed in relation to this hypothesis, whereas models (2), (3), (5) and (6) are discussed in the subsequent hypothesis. Both coefficients of Cash Flow proxy/BVoA and CFO/BVoA are negatively related to bidder CAR, which we would expect, based on previous studies (Harford, 1999; Jensen, 1986; Lang et al., 1991). Specifically, the two coefficients illustrate that by increasing the cash flow/assets ratio with one unit, CAR decreases with 1.9%-point (Cash Flow proxy/BVoA) and 2.2%-point (CFO/BVoA). However, both coefficients are tested to be insignificant and therefore, we are not able to determine whether the negative relation between the bidder cash flow and bidder CAR is correct. The different relations between control variables and bidder CAR are all consistent with previous stated theory, except for the leverage variable, but the general picture underlines the level of validity in this paper. Interestingly, both firm size and insider ownership are highly significant at 1% alpha. Thus, we are able to conclude that larger firm size has a negative effect on bidder CAR, whereas insider ownership has a positive effect, indicating that e.g. management with ownership stakes tend to be more cautious when making acquisitions.

Table 3.2

Regression analyses on the effects from bidder cash flow and investment opportunities

Robust t-statistics in parentheses. Significance level indication: 1% - ***, 5% - **, 10% - *

Variables of interest	(1) CAR[-2;2]	(2) CAR[-2;2]	(3) CAR[-2;2]	(4) CAR[-2;2]	(5) CAR[-2;2]	(6) CAR[-2;2]
Cash Flow proxy/BVoA	-0.019		-0.007			
	(-0.804)		(-0.249)			
Cash Flow proxy/BVoA × Low Q		-0.082***	-0.077**			
		(-3.234)	(-2.120)			
CFO/BVoA				-0.022		-0.018
				(-0.993)		(-0.706)
CFO/BVoA × Low Q					-0.182***	-0.166**
					(-3.167)	(-2.401)
Low valuation (Tobin's Q < 1)			-0.010			-0.002
			(-1.322)			(-0.240)
Control variables						
ln(Firm size)	-0.005***	-0.005***	-0.006***	-0.006***	-0.006***	-0.006***
	(-3.004)	(-2.909)	(-3.139)	(-3.045)	(-3.458)	(-3.433)
Relative size	0.001	0.002	0.002	0.001	0.001	0.000
	(0.342)	(0.508)	(0.569)	(0.211)	(0.146)	(0.013)
Insider ownership	0.057***	0.057***	0.055***	0.057***	0.053***	0.054***
	(2.883)	(2.878)	(2.701)	(2.904)	(2.694)	(2.697)
Leverage (D/E)	-0.007	-0.003	0.006	-0.008	0.000	0.001
	(-0.492)	(-0.205)	(0.374)	(-0.556)	(0.020)	(0.091)
Sigma	0.017	0.033	0.019	0.009	0.019	-0.021
	(0.059)	(0.118)	(0.068)	(0.031)	(0.067)	(-0.073)
Public target dummy	-0.021	-0.022	-0.023	-0.022	-0.024	-0.024
	(-1.240)	(-1.255)	(-1.286)	(-1.257)	(-1.398)	(-1.395)
Run up (BHAR)	-3.016	-3.182	-3.263	-3.016	-3.265	-3.194
	(-1.374)	(-1.456)	(-1.508)	(-1.379)	(-1.508)	(-1.487)
Constant	0.108***	0.119***	0.130***	0.106***	0.107***	0.111***
	(4.223)	(4.844)	(4.789)	(4.294)	(4.488)	(4.214)
Observations	547	547	547	547	547	547
Adjusted R-squared	0.112	0.117	0.116	0.113	0.121	0.120
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes

Based on the analysis, both cash flow/assets ratios are tested to have an insignificant effect on CAR generated by Nordic bidders through mergers and acquisitions. Therefore, we are not able to present sufficient evidence that high bidder cash flow in general will affect bidder abnormal returns negatively.

Next, Lang et al. (1991) found that bidder's investment opportunities have a significant explanatory effect related to the previous findings of Jensen (1986). They measure the investment opportunities as Tobin's Q, a ratio of the market value of the companies' assets and their replacement costs. Thus, companies with low investment opportunities are expressed through low Qs and vice versa. They found that bidders with high FCFs and low Qs had a negative effect on bidder return, which we think is a valid add-on to the cash flow statements. Therefore, we also state the following hypothesis:

H₂: *High bidder cash flow and low investment opportunities will affect bidder abnormal*
returns negatively

For this hypothesis, we also test the CAR affect from Tobin's Q by adding a dummy equal to one for low Qs. Additionally and importantly, we include the two variables of cash flow measures from the previous hypothesis as an interaction term with bidder companies having Q-values lower than one. These two variables are of high interest, as they cover the combined effect from bidder's cash flow and investment opportunities.

Overall, we are interested in regression models (2), (3), (5) and (6). In model (2) and (5), we only include normalised cash flows for low-Q bidders where model (2) is based on the Cash Flow proxy measure and model (5) is based on the CFO measure. Interestingly, we find both coefficients in the two models to be highly significant at a 1% level. Thus, the two models are illustrating that by increasing the cash flow/BVoA ratio with one for low Q firms, the bidder CAR decreases with 8.2%-points and 18.2%-points respectively. In terms of the control variables, we see a very similar trend of significance and CAR relation. It is important to emphasise that companies in different industries have different requirements to capital structure. However, we control for this variation through one of our fixed effects control variables that controls for all 11 different sectors previously defined by 2 digit GICS codes.

In model (3) and (6), we allow for interaction between all three defined variables together to test whether low-Q firms have a marginal explanatory effect. Firms with low Qs engaging in acquisitions have a negative effect on CAR, which we expected. However, the variables are not tested to be significant comparable to previous studies (Lang et al., 1991).

Based on the regression analysis, both cash flow/assets ratios for low-Q firms only are tested to have a highly significant effect on CAR generated by Nordic bidders through M&A. This is in line with previous findings related to principal agent and cash flow theory where managers (agents) in companies with minimal investment opportunities tend to engage in negative NPV projects instead of favouring shareholders (principals) through a desirable payout policy. Concluding, we are able to present sufficient evidence that high bidder cash flow for companies with low investment opportunities will affect bidder abnormal returns negatively, while high cash flow or low investment opportunities in general does not significantly affect bidder returns.

3.3   Merger waves

In an attempt to find evidence related to our previous stated hypothesis, that acquisitions during merger waves will affect bidder returns negatively, we first present the CAARs and the test statistics of the CAARs related to the M&A announcements within and outside merger waves. Next, we test the findings in a cross-sectional multiple regression below.

Figure 7. CAAR plot of acquisitions within and outside merger waves
Source: Own creation
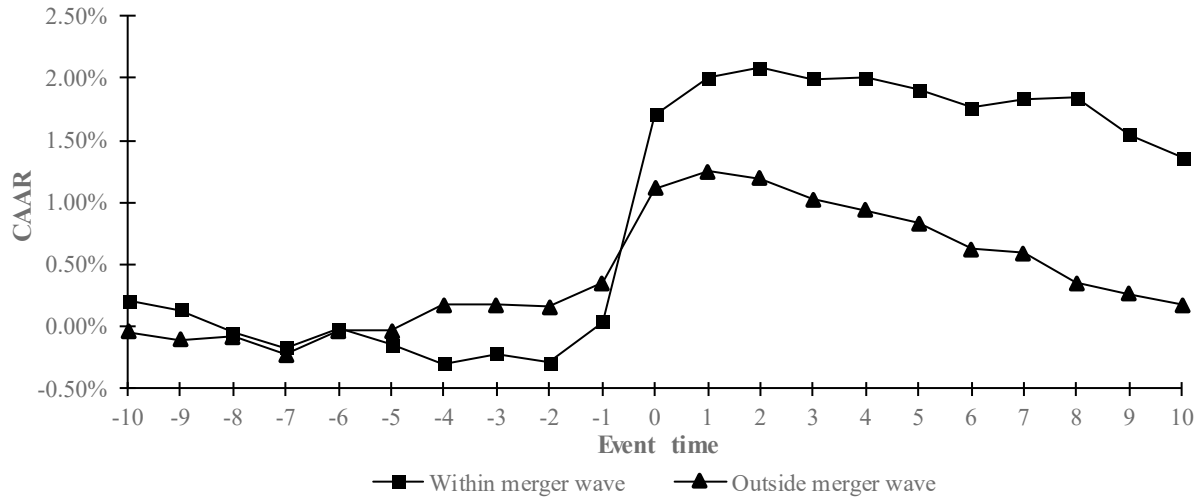
Surprisingly, we observe that the CAAR generated from deals within merger waves exceed the CAAR generated from deals outside merger waves. This is not in line with previous studies, discussed in the earlier section, that find bidder returns to be lower within merger waves compared to outside merger waves, based on the potential overvaluation (Rhodes-Kropf & Viswanathan, 2004). From Figure 7, we see that both CAARs start increasing one day prior to the time of the event, especially the CAAR within merger waves. We cannot conclude the reason behind this trend, but possible reasons could be potential pre-leakage of information into the market or wrong determination of the exact announcement date. However, since we have manually verified every single date using multiple data sources, which is explained earlier in this paper, we find this reason to be less likely. After the announcement, the CAAR generated from deals within merger waves are only experiencing a slight decrease, whereas the CAAR generated from deals outside merger waves are experiencing a more strong decrease in line with the event time. This is illustrated both in Figure 7 and in Table 3.3.

Observing the announcements within merger waves illustrated in Table 3.3, we see a tendency that the CAARs increase and get more significant as the event windows further narrow, based on the parametric tests, t-test and Kolari test, and the nonparametric test, rank test. However, the level of significance is overall noteworthy through all event windows. Starting with the 21-day event window, we see that the CAAR is 1.37% where the t-test and rank test find it significant at a respectively 10% level and 5% level. Conversely, when performing the other parametric test, Kolari, it finds the 21-day CAAR of 1.37% to be insignificant. As defined earlier, the Kolari test is robust and adjusts for cross-correlation and variance inflation meaning that it controls for event-induced volatility. Next, when narrowing the event window down to five days, we find a CAAR of 2.31%, which is highly significant at a 1% level, based on all three tests. The same significance is valid in the three-day window with CAAR of 2.23%.

Table 3.3
Event study CAARs inside and outside merger waves

Significance level indication: 1% - ***, 5% - **, 10% - *

Panel A: Announcements within merger waves					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	2.23%	234	8.573***	5.490***	5.843***
(-2;2)	2.31%	233	6.821***	4.195***	5.101***
(-5;5)	1.78%	231	3.491***	2.087**	3.091***
(-10;10)	1.37%	232	1.899*	1.457	2.002**
Panel B: Announcements outside merger waves					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.16%	369	4.524***	3.787***	5.298***
(-2;2)	1.03%	353	3.033***	2.693***	3.338***
(-5;5)	1.06%	365	2.194**	1.756*	2.045**
(-10;10)	-0.16%	352	-0.230	0.202	0.795

The same tendency of increasing CAARs as the event windows are narrowed also goes for the announcements outside merger waves. We find lower CAARs in the four different event windows compared to announcements within merger waves. Furthermore, the level of significance is also dubious in the broadest window compared to the three-, five- and 11-day windows. In the 21-day event window, the CAAR is negative with -0.16%. However, none of the three performed parametric and nonparametric tests find the value significant and therefore, we cannot rely on this outcome. In the 11-day window, the CAAR is 1.06% and in contrast to the broader event window, this value is tested to be significant, based on all three tests. Specifically, the t-test and rank test find it to be significant at a 5% level, whereas the Kolari test finds it significant at a 10% level. Next, when narrowing down the window to five days, CAAR is 1.03% and all tests find the value to be significant at a 1% level. Lastly, the same significance tendency goes for the CAAR of 1.16% in the three-day event window.

Based on the above analysis of significance tests, we find the CAAR values of announcements within merger waves to be statistically significant in practically all events, except for the 21-day event window, based on the Kolari test. In addition, we find the CAAR values of announcements outside merger waves to be statistically significant in the three-, five- and 11-day windows. However, the findings illustrate higher CAARs from announcements within merger waves than outside merger waves, which interestingly, illustrates an opposite CAAR distribution than initially and theoretically assumed.

We now test these findings in a cross-sectional multiple regression analysis to determine whether we have sufficient evidence for our stated merger wave hypothesis. The hypothesis was stated based on the neoclassical and Rhodes-Kropf and Viswanathan's adjusted model (2004) of Shleifer and Vishny's findings (2003) related to the behavioural theory. The neoclassical theory involves the difference between the market's and target shareholders' own valuation estimate of target's assets (Gort, 1969),

which Andrade et al. (2001) relate to industry shocks, based on e.g. technological innovations or supply shocks. Rhodes-Kropf and Viswanathan's (2004) adjusted model illustrates that management tend to acquire targets based on generous valuation estimates in overvalued stock markets. This leads to high acquisition prices during strong economic times, which Sudarsanam (2010) claims to be the times when merger waves occur. In relation to the discussed theoretical perspectives, we have stated the following hypothesis to be tested:

H₃: *Acquisitions within merger waves will lead to lower abnormal returns compared to acquisitions outside merger waves*

In the regression overview below, we present seven different regression models, based on three different variables aside from the control variables, to increase the robustness of the analysis. The merger wave dummy is equal to one if transaction is announced during a sector merger wave, defined in the data section of this paper. To further illustrate merger wave related factors, we follow Xu's (2017) approach by including two other dummies equal to one if the transaction is announced respectively as one of the first or last 20% in the merger wave, thus constituting the first mover dummy and late mover dummy. None of the estimated coefficients is tested to be significant. However, we still find it relevant to shortly discuss the different findings from each model related to our expectations. In models (1) and (7), we only test the merger wave dummy. The difference between the two models is whether we have chosen to include the fixed effects control variables. Surprisingly, both coefficients are positively related to CAR, which is not in line with our expectations, based on theories and previous findings. They illustrate, that bidder CARs for acquisitions outside merger waves were respectively 0.3%-points and 0.7%-points lower than those made within merger waves on average. In models (2) and (3), we test the first mover dummy and the late mover dummy respectively together with the merger wave dummy. Both dummies are tested to have a positive effect on CAR together with the merger wave dummy. However, all coefficients are far from acceptable critical values. Following Xu (2017), we would expect the effect from late movers to be higher compared to first movers. This is to some extent the same pattern in these models, but the difference is minimal. In models (4), (5) and (6), we test all three coefficients to examine the explanatory effect from each coefficient at once. The only difference between our presented models is whether we include no, one or both fixed effects control variables. The three models indicate very similar results as illustrated with the four other models, namely positive, but minor and insignificant relations to bidder CAR. An interesting aspect in models (5), (6) and (7) is that the three models find the control variable, public target dummy, to be significant at a 10% and 5% level suggesting that acquisitions of public targets have a negative effect on bidder returns (CAR). This is in line with previous findings (Faccio et al., 2006).

Finally, all models indicate that acquisitions during merger waves have a positive effect on CAR, except for model (4), which finds merger waves to have no effect. However, based on the insignificant results from all seven regression models, where models (1) and (7) are testing the effect from merger waves exclusively, we are not able to present sufficient evidence that acquisitions within merger waves will lead to lower abnormal returns compared to acquisitions outside merger waves.

Table 3.4
Regression analyses on the effects from acquisitions within and outside merger waves

Robust t-statistics in parentheses. Significance level indication: 1% - ***, 5% - **, 10% - *

Variables of interest	(1) CAR[-2;2]	(2) CAR[-2;2]	(3) CAR[-2;2]	(4) CAR[-2;2]	(5) CAR[-2;2]	(6) CAR[-2;2]	(7) CAR[-2;2]
Merger wave dummy	0.003	0.001	0.002	-0.000	0.002	0.003	0.007
	(0.394)	(0.168)	(0.234)	(-0.032)	(0.399)	(0.484)	(1.411)
First mover dummy		0.006		0.007	0.012	0.007	
		(0.627)		(0.729)	(1.492)	(0.791)	
Late mover dummy			0.007	0.008	0.010	0.008	
			(0.583)	(0.662)	(0.972)	(0.711)	
Control variables							
ln(Firm size)	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.005***	-0.006***
	(-3.394)	(-3.362)	(-3.378)	(-3.340)	(-3.539)	(-3.300)	(-3.671)
Relative size	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000
	(0.599)	(0.561)	(0.573)	(0.524)	(-0.250)	(-0.152)	(-0.709)
Insider ownership	0.056***	0.056***	0.057***	0.057***	0.062***	0.054***	0.058***
	(2.873)	(2.874)	(2.897)	(2.906)	(2.986)	(2.835)	(2.894)
Leverage (D/E)	-0.012	-0.012	-0.012	-0.012	-0.011	0.000	0.002
	(-0.984)	(-0.989)	(-0.964)	(-0.966)	(-0.928)	(0.048)	(0.291)
Sigma	0.101	0.103	0.103	0.105	0.090	0.110	0.084
	(0.360)	(0.365)	(0.366)	(0.372)	(0.316)	(0.382)	(0.286)
Public target dummy	-0.020	-0.020	-0.020	-0.020	-0.023*	-0.023*	-0.025**
	(-1.565)	(-1.561)	(-1.562)	(-1.558)	(-1.880)	(-1.840)	(-2.165)
Run up (BHAR)	-2.897	-2.883	-2.915	-2.901	-2.171	-2.572	-1.819
	(-1.332)	(-1.322)	(-1.338)	(-1.328)	(-0.953)	(-1.150)	(-0.780)
Constant	0.099***	0.099***	0.099***	0.099***	0.061***	0.069***	0.041***
	(4.529)	(4.533)	(4.522)	(4.528)	(3.380)	(5.260)	(2.736)
Observations	586	586	586	586	586	586	586
Adjusted R-squared	0.118	0.117	0.117	0.116	0.095	0.108	0.089
Year FE	Yes	Yes	Yes	Yes	No	Yes	No
Sector FE	Yes	Yes	Yes	Yes	Yes	No	No

3.4   Frequent acquirers and acquisition experience

In this section, we investigate the effect on abnormal returns from experience gained in previous mergers and acquisitions. We use sub-samples of the event study and subsequently a cross-sectional regression analysis to investigate the three hypotheses outlined earlier, which are

H₄: *Acquirers which frequently engage in acquisitions should experience higher*
abnormal returns, based on the learning hypothesis

H₅: *Acquiring companies, which have a high fraction of acquisitions within the Nordics, should experience higher abnormal returns than those, which do not*

H₆: *Acquirers with a high degree of similarity between deals (e.g. method of payment and relatedness in terms of industry) experience higher abnormal returns*

We define several variables used in testing these hypotheses and generally try to follow prior research in doing so, although we make a few minor alterations ourselves. Firstly, we define a variable to denote a given company as a frequent acquirer. In doing so we follow Fuller et al. (2002) who designate companies which acquired five companies or more within a three year period prior to the deal as a frequent acquirer. Using this measure, we get 39 events with the acquiring company marked as frequent acquirer. Next, we also employ an alternative measure to the dummy by using a discrete measure of the number of completed deals within the same three-year period, since this increases the robustness of our results. These two variables are the main effects we wish to know the impact from and are directly linked to the first hypothesis above. The two following hypotheses require measures of the similarity between deals and the variables used for this purpose are structured as in Ismail and Abdallah (2013). We compute three variables, namely the fraction of deals within the three year period which were Nordic targets, the fraction of previous deals using the same payment method as the event and finally, the fraction of previous deals within the same industry as the target in the event. Thus, these three variables are measured as percentages (or decimal numbers).

In Figure 8 below, we see a slightly surprising CAAR result. The frequent acquirer line, representing those with more than five acquisitions completed, generally perform as expected until the event day, however, on the event day itself, the jump in CAAR is not nearly as high as those who completed less than five acquisitions in the preceding three years. In addition, the CAAR of frequent bidders

Figure 8. CAAR plot for frequent and non-frequent acquirers
Source: Own creation
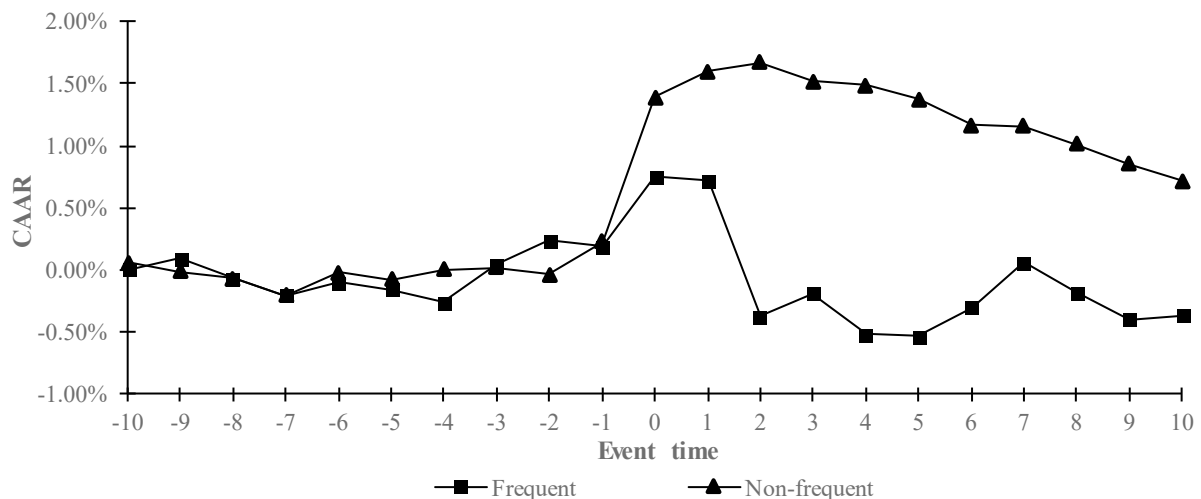
Table 3.5
Event study CAARs by frequent and non-frequent acquirers

Significance level indication: 1% - ***, 5% - **, 10% - *

Event window length	CAAR	N	t-test	Kolari test	Rank test
Panel A: Frequent acquirers					
(-1;1)	0.48%	39	0.937	0.917	0.815
(-2;2)	-0.42%	39	-0.624	-0.264	0.225
(-5;5)	-0.50%	38	-0.496	-0.690	0.240
(-10;10)	-0.51%	36	-0.356	-0.523	0.489
Panel B: Non-frequent acquirers					
(-1;1)	1.65%	564	8.406***	6.638***	7.273***
(-2;2)	1.68%	547	6.513***	5.303***	5.599***
(-5;5)	1.47%	558	3.919***	3.007***	3.360***
(-10;10)	0.51%	548	0.944	1.356	1.743*

decreases sharply on the second day following the event day and stays more or less below zero as of there. Thus, it seems that companies, which frequently engage in acquisitions, do not create additional value for their shareholders. The CAAR results of Table 3.5 confirm this observation. For all windows, except the $(-1;1)$, the CAAR for frequent acquirers is negative of around -0.5%, although not nearly significant in any of the cases. We cannot eliminate the possibility of some statistical uncertainty given the small amount of companies in the frequent acquirers group, however, 30 observations or more are generally accepted as a reasonable level for statistical inferencing (Newbold, Carlson, & Thorne, 2013; Stock & Watson, 2015). CAARs for the non-frequent group are generally more aligned with the overall event study results, which is expected since the frequent acquirers only represent around 6% of the full sample. Thus, as with the full sample results, CAARs are generally highly significant (at the 1% level) and only small variances are exhibited across windows, with the $(-10;10)$ window as exception once again.

Turning to the results of the regression analysis in Table 3.6, we again see similar results regarding the difference between frequent and non-frequent bidders. In regressions (1) and (2), where we employ both the dummy and discrete measurement of frequency respectively, we once again observe that frequent acquirers underperform. Both coefficients are slightly negative indicating that the higher frequency of acquisitions, the lower abnormal returns, although neither coefficients are statistically significant. We believe that the consistency across both methods serves as a strong indication that frequent acquirers actually do underperform, and the result is not completely surprising, given the results of previous research on the matter. Thus, we do not find any evidence in favour of the organisational learning hypothesis, based on the above.

In testing the two hypotheses regarding Nordic acquisitions and relatedness of previous deals by payment method and industry, we rely on the regression analysis. Firstly, the regression in (3) shows an interesting result on the fraction of previous Nordic acquisitions coefficient. Using the dummy variable to determine frequent acquirers makes the coefficient on the fraction of previous completed Nordic deals negative and statistical significant at 5% alpha. This is surprising, as we would expect this coefficient at least to be positive based on the notion, that learning through serial acquisitions within a defined geographical market place should increase the knowledge and skills of the company within this given market. However, it does not seem that the market interpret many Nordic acquisitions as positive and there is hardly evidence on the learning hypothesis regarding this matter. What is also interesting is that the estimate of the public target dummy is negative with a -2.1%-point effect on bidder CAR and that it becomes significant at 10% in regression (3). This finding is in line with Fuller et al. (2002) who also conclude that public acquisitions by frequent acquirers are value destroying.

In models (4) and (5), we include the two variables regarding payment method and industry relatedness and further the dummy and numeric measure of frequent acquirers respectively. A few noticeable effects should be considered here. Firstly, the coefficients of the variables representing frequent acquirers are almost unchanged, with only minor changes in the t-stats as well. However, the coefficients on the two variables representing relatedness all show interesting moments. As evident, all four coefficients in the two models have slightly negative signs, although with varying significance levels. The variable representing the similarity in payment method between deals is barely negative in both models, but far from being significant, and thus we cannot conclude anything substantial, except that this variable presumably does not have any effect on abnormal returns. Ismail and Abdallah (2013) show that both cash and equity payments have a positive effect on CARs in their regression, but their estimates are not significant either, adding some material to the discussion on acquisition experience effects. On the other hand, the variable representing industry relatedness is more interesting, especially in model number (4). As evident from the table, the coefficient on the variable is negative at -0.9% and is significant at 10%. Thus, when using the simple dummy to determine frequent acquirers, multiple acquisitions within the same industry does actually affect CARs in a negative direction, which is quite surprising, but still in line with the results of Ismail and Abdallah (2013), who also find a negative relationship, although not statistical significant. The statistical significance vanishes however, in the model using the numerical measure of prior acquisitions, but is still close to a 10% significance level. In the last model, we employ all of the variables and use the number of acquisitions within the preceding three-year period to measure frequent acquirers. This model shows a quite different picture than the previous ones, in that no of the coefficients are significant while only a few are close to any mentionable significance level. The public target dummy that was proved significant in the three previous models, just barely falls short of 10% significance, indicating that this variable could in fact have an effect on

Table 3.6
Regression analyses on the effects from acquisition experience

Robust t-statistics in parentheses. Significance level indication: 1% - ***, 5% - **, 10% - *

	(1)	(2)	(3)	(4)	(5)	(6)
Variables of interest	CAR[-2;2]	CAR[-2;2]	CAR[-2;2]	CAR[-2;2]	CAR[-2;2]	CAR[-2;2]
Frequent acquirer dummy	-0.008		-0.009	-0.008		
	(-0.905)		(-1.013)	(-0.884)		
Number of prior acquisitions		-0.002			-0.001	-0.001
		(-1.253)			(-0.932)	(-0.743)
Nordic acquisitions fraction (%)			-0.014**			-0.013
			(-2.293)			(-1.489)
Previous same payment (%)				-0.004	-0.003	0.004
				(-0.609)	(-0.474)	(0.517)
Previous same industry (%)				-0.009*	-0.008	-0.006
				(-1.671)	(-1.608)	(-1.096)
Control variables						
ln(Firm size)	-0.006***	-0.005***	-0.006***	-0.006***	-0.006***	-0.006***
	(-3.323)	(-3.136)	(-3.565)	(-3.399)	(-3.250)	(-3.468)
Relative size	0.000	0.000	0.000	-0.000	-0.000	0.000
	(0.493)	(0.492)	(0.436)	(-0.128)	(-0.071)	(0.247)
Insider ownership	0.055***	0.056***	0.059***	0.055***	0.055***	0.058***
	(2.837)	(2.872)	(3.057)	(2.826)	(2.860)	(3.050)
Leverage (D/E)	-0.012	-0.012	-0.012	-0.011	-0.011	-0.011
	(-1.015)	(-1.001)	(-0.979)	(-0.904)	(-0.883)	(-0.877)
Sigma	0.100	0.097	0.085	0.059	0.059	0.066
	(0.355)	(0.346)	(0.305)	(0.210)	(0.212)	(0.235)
Public target dummy	-0.021	-0.021	-0.021*	-0.022*	-0.022*	-0.021
	(-1.581)	(-1.609)	(-1.648)	(-1.676)	(-1.682)	(-1.641)
Run up (BHAR)	-2.870	-2.893	-2.866	-2.891	-2.912	-2.889
	(-1.315)	(-1.327)	(-1.339)	(-1.338)	(-1.348)	(-1.346)
Constant	0.101***	0.103***	0.112***	0.105***	0.106***	0.110***
	(4.807)	(4.924)	(5.320)	(4.879)	(4.928)	(5.157)
Observations	586	586	586	586	586	586
Adjusted R-squared	0.119	0.120	0.126	0.122	0.122	0.124
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes

abnormal returns, at least in some circumstances. A further test of the interaction between public targets and acquirers with five or more completed deals preceding the event could probably reveal if this statement is true or not. Neither the fraction of Nordic acquisitions nor the similarity in industries of previous deals, which earlier showed a significant impact, are close to significance when all effects are controlled for at once, implying that any definitive evidence from these factors are hard to present.

In sum, we find it difficult to make any definitive conclusions on the three hypotheses stated above. We believe that we have some evidence on the fact that serial, or frequent, acquirers do not perform better in later acquisitions, compared to non-frequent acquirers. While the event study provides what we believe is somewhat clear answers on this, the regression analysis does not. If the relationship shown above should be attributed to the organizational learning hypothesis, or e.g. Roll's Hubris theory

(Roll, 1986), is hard to answer precisely without further investigation. However, we believe that some Hubris might exist in the management of companies with a high degree of Nordic acquisitions, as we find it hard to come up with other reasons to why this variable exhibits a, in some cases clearly and significant, negative relationship with abnormal returns. As per the last two of our three hypotheses, we find only very limited evidence on the relationship between previous deals and the current, except for when the current target is public. This is especially true for the payment method similarity, while the industry similarity indicator, is significant, or close to, in some circumstances. The impact from industry related experience is in line with some prior research, but the sign of the coefficient is still opposite of what we expected, as this presumably should have been positive if the learning hypothesis were to hold. Instead, this variable might also show effects from Hubris, i.e. that managers who previously undertook a high fraction of focused acquisitions continues on this path, with previous deals being value accretive or not.

3.5 Effects from choice of financial adviser

Next, we analyse the potential impact that financial advisers may have on bidder returns in acquisition announcements. Referring to the hypotheses formulated in the literature review, we try to answer three questions regarding the possible value creation from employing investment banks in M&A. Firstly, primarily based on the event study we try to identify whether the use of external financial advisers in general are value accretive to bidder shareholders. We construct a set of dummy variables for this purpose – one indicating whether a financial adviser was employed and one to indicate whether the adviser was top-tier or non-top-tier (both advising the buy-side), based on the league tables presented earlier, as was the procedure in several prior studies (Fang, 2005; Golubov et al., 2012). Next, we try to determine the CAR effects from adviser reputation, i.e. if advisers with a better reputation in the market (top-tier advisers) create additional value. We try to answer this using both the event study and a subsequent regression analysis. Finally, we wish to explore the effects of advisers being Nordic based, since we believe these could have a better understanding of the Nordic M&A market and more robust client relationships, thus allowing for higher value creation than their non-Nordic counterparts.

Taking a first glance at the CAAR plot in Figure 9, we observe some quite interesting and mildly surprising effects. In the time prior to the event day, the group with no external advice employed, experience an average abnormal return of around zero, as would probably be expected. The picture is different for the groups employing investment banks though. The group of firms who employed a non-top-tier banker exhibits a small decline in CAAR just before the event, and takes a significant jump on the event day and the day after, for then to end up at more or less the same CAAR level as the group who did not use external advice. The decline prior to the event is not steep, and it is possible that the effect is due to random noise in the data. The trend of both the non-top-tier group and no-advice group is more

Figure 9. CAAR plot of acquisitions completed with non-top-tier, top-tier and no external advise
Source: Own creation
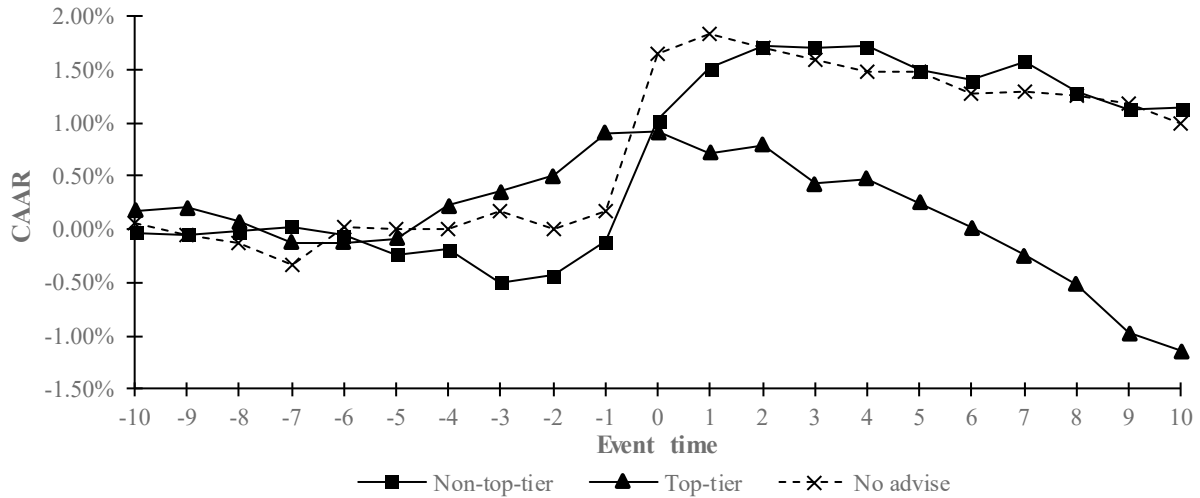
or less similar from the event day and onwards. Thus, it is hard to determine whether advisers do in fact create value by looking at the plot.

The line showing the CAAR of firms using top-tier advisers, show a quite different path. From event time $t = -4$ until day $t = -1$ the performance of abnormal returns for these firms is notably positive, however on the event day itself, an almost non-existing effect is exhibited, which is quite interesting. However, the explanation for this effect might be quite intuitive. If it is assumed that, the choice of hiring a top-tier bank over a non-top-tier is positively correlated with the size of the bidder and/or the target[5], it could be very likely that information about the deal were to slip into the market before the announcement day. This is true, since large listed companies and their advisers typically will be more exposed to media attention and other sources of leakage (from internal or external sources), which market participants could pick up prior to the deal announcement and thus trade accordingly.

From the CAAR results in Table 3.7, we see that the interpretation of the CAAR plot is more or less confirmed. Considering the groups with non-top-tier advice and no advice, we see a difference in CAAR of almost 1%-point in the five-day window, with all results significant at the 1% level. The same result is true for the three- and 11-day windows in general, although the difference between the CAARs narrows. One noteworthy observation though, is the low Kolari test value in the $(-5; 5)$ window for non-top-tier advisers. This might seem odd since we do not observe similar results in other instances, but it could mean that the 11-day event window is prone to either heavy cross-correlation, event induced volatility or even both, since neither of the two other tests show signs of insignificance. We also observe that the CAARs of firms using top-tier advice are positive in all, but one occasion. However, neither of

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[5] A "quick-and-dirty" regression with the dummy for top-tier advisers as the dependent variable and the firm size of the bidder as well as the relative size of the target as the independent variables confirmed, that this was in fact true in both an OLS and logistic regression, with both independents significant well beyond the 1% level.

Table 3.7
Financial adviser effects on abnormal returns

Significance level indication: 1% - ***, 5% - **, 10% - *

Event window length	CAAR	N	t-test	Kolari test	Rank test
Panel A: Non-top-tier adviser used					
(-1;1)	2.11%	159	6.113***	4.176***	5.399***
(-2;2)	2.46%	151	5.311***	4.271***	4.984***
(-5;5)	1.65%	158	2.680***	1.526	2.888***
(-10;10)	1.00%	149	1.094	1.192	2.396**
Panel B: Top-tier adviser used					
(-1;1)	0.20%	110	0.531	0.541	0.991
(-2;2)	0.32%	109	0.665	0.741	0.713
(-5;5)	0.89%	107	1.253	0.908	0.633
(-10;10)	-1.51%	107	-1.398	-0.228	-1.458
Panel C: No adviser used					
(-1;1)	1.78%	334	6.622***	5.757***	6.076***
(-2;2)	1.52%	326	4.354***	3.316***	4.004***
(-5;5)	1.34%	331	2.561**	2.000**	2.366**
(-10;10)	0.83%	328	1.127	0.938	1.777*

the tests statistics show any signs of significance and the 21-day window even exhibits negative values, meaning that firms using top-tier bankers could be experiencing negative returns on average.

When we draw on the results of the regression analysis in Table 3.8, we see a high level of consistency with the event study results. In regression (1) we include only the dummy indicating whether the bidder employed a financial adviser or not, and observe that the coefficient is positive as predicted by the event study, but not statistically significant. We also notice that the public target dummy is negative with -2.2% and significant at 10%, which is somewhat in line with what we expect.

In model (2), we include an interaction term on the use of financial advisers and the public target dummy, and further include the Cash and Equity settlement dummies. Golubov et al. (2012) argue that the public status is closely related to the payment method in deals and further show evidence on this. Looking at our results, we see that when bidders use investment bank advice in acquiring public companies, the coefficient is highly positive at 4.4% and indeed very close to being significant at 10%. This is more or less in line with Golubov et al. (2012) who show that when top-tier bankers are employed in acquiring public companies, they exhibit a strong positive relationship with CARs.

When we include the dummy for top-tier advisers in regression (3) and further interact this with the public targets, instead of the general indicator of buy-side adviser use, we see a somewhat surprising result. Firstly, we notice that the overall variable indicating whether financial advisers increase CARs is

positive at 1.1% and significant at 5%. However, if the banker hired is top-tier, this effect is eliminated, since the dummy indicating top-tier bankers is negative at -1.2% and even significant at 10%. Thus, we confirm the results of the event study implying that top-tier advisers may in fact not be value creating and instead be value destroying.

In the regressions (4) and (5) we omit the variables indicating whether the adviser was top-tier in general and the related interaction term of public targets, and instead we include two new dummies indicating whether top-tier advisers are Nordic based or non-Nordic based. This yields a quite interesting result once more. As evident from both models, the general dummy indicating the effect of investment banking use is still positive at 1.0% and 1.1% respectively, but now only significant at 10%. The dummies for non-Nordic top-tier advisers are however highly negative at -2.5% and -2.7%, respectively, and both significant at 10%. The dummy for Nordic top-tiers are on the other hand just slightly below zero at -0.4% and not near being significant. This suggests that for top-tier advisers, non-Nordic based advisers may in fact be underperforming their Nordic based counterparts, just as our hypothesis suggests, although we cannot statistically confirm the impact and significance of the Nordic based advisers.

In sum, we believe we have solid evidence for and against our hypotheses respectively. We feel confident in concluding that advisers in general are value accretive as both the event study and most of our regressions show this. We also accept the fact that top-tier advisers may in fact not be value creating, although our hypothesis and some prior research suggest this (Golubov et al., 2012). Lastly, we also believe that we can conclude on a difference between Nordic based and non-Nordic based advisers in line with our last hypothesis, at least for top-tiers. We do also note that this area might need further research to elaborate on the effect under other circumstances, e.g. non-top-tier advisers.

On a final note, we draw attention to the fact that advisers may not always be disclosed at the time of the acquisition announcement and this is something the reader should have in mind. While we believe there could be some effect hidden in the information of announcing who the adviser was, at the time of the acquisition announcement (i.e. a signalling effect), we do not perceive the disclosure of the adviser's name, at a later point in time, as a major concern. This is based on a believe that even though the adviser may be unknown by shareholders for some time, the effects that the employment of said adviser had on the deal could still be prevalent. For example, if the buy-side adviser in question succeeded in securing a lower deal value, a shorter time to completion (perhaps because of better negotiation skills) or influenced the payment type to target shareholders (i.e. cash or stock), we believe it would still be possible to measure this effect without knowing who the adviser was at the time. Also, we do not control for the determinants of investment banker choices by acquiring firms, which have been found to affect bidder abnormal returns (Golubov et al., 2012; Servaes & Zenner, 1996). Such endogeneity problems are not controlled for in this analysis, and as such we assume a more thorough and solid result could be presented using a two stage least squares, or Heckman, procedure to eliminate such concerns.

Table 3.8
Regression analyses on the effects from employment of financial advisers

Robust t-statistics in parentheses. Significance level indication: 1% - ***, 5% - **, 10% - *

Variables of interest	(1) CAR[-2;2]	(2) CAR[-2;2]	(3) CAR[-2;2]	(4) CAR[-2;2]	(5) CAR[-2;2]
Buyside used adviser	0.006	0.006	0.011**	0.010*	0.011*
	(1.347)	(1.182)	(2.215)	(1.901)	(1.950)
Buyside used adviser × public target		0.044			
		(1.644)			
Buyside used Total top-tier (top 8)			-0.012*		
			(-1.715)		
Buyside used Total top-tier (top 8) × public target			0.017		
			(0.801)		
Buyside used Nordic top-tier (top 8)				-0.004	-0.004
				(-0.618)	(-0.568)
Buyside used Non-Nordic top-tier (top 8)				-0.025*	-0.027*
				(-1.869)	(-1.947)
Cash settlement		0.001	-0.001		-0.003
		(0.201)	(-0.212)		(-0.460)
Equity settlement		-0.003	-0.007		-0.009
		(-0.249)	(-0.661)		(-0.772)
Control variables					
ln(Firm size)	-0.006***	-0.006***	-0.006***	-0.005***	-0.005***
	(-3.509)	(-3.444)	(-3.768)	(-3.636)	(-3.516)
Relative size	0.000	-0.000	-0.000	-0.000	-0.000
	(0.134)	(-0.039)	(-0.636)	(-1.034)	(-0.975)
Insider ownership	0.056***	0.056***	0.059***	0.061***	0.060***
	(2.955)	(2.919)	(2.995)	(3.132)	(3.034)
Leverage (D/E)	-0.012	-0.013	0.000	-0.000	0.000
	(-0.991)	(-1.013)	(0.024)	(-0.046)	(0.017)
Sigma	0.095	0.109	0.078	0.050	0.069
	(0.333)	(0.395)	(0.276)	(0.168)	(0.241)
Public target dummy	-0.022*	-0.054**	-0.032**	-0.024**	-0.023*
	(-1.710)	(-2.426)	(-2.113)	(-2.053)	(-1.949)
Run up (BHAR)	-2.852	-2.851	-1.878	-1.779	-1.938
	(-1.299)	(-1.290)	(-0.797)	(-0.756)	(-0.814)
Constant	0.104***	0.133***	0.044***	0.042***	0.044***
	(4.963)	(4.620)	(2.962)	(2.905)	(2.875)
Observations	586	586	586	586	586
Adjusted R-squared	0.121	0.119	0.088	0.094	0.093
Year FE	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes

3.6 Cross-border acquisitions

In relation to our previously stated hypothesis, that domestic acquisitions outperform cross-border acquisitions, we present the CAARs and associated test statistics related to the domestic and cross-border deals. Figure 10 illustrates the development in CAAR through event time for both deal types. Interestingly, we see that CAARs from domestic and cross-border transactions are experiencing an almost consistently parallel development through event time. As observed with some of the other event

Figure 10. CAAR plot for domestic and cross-border acquisitions
Source: Own creation
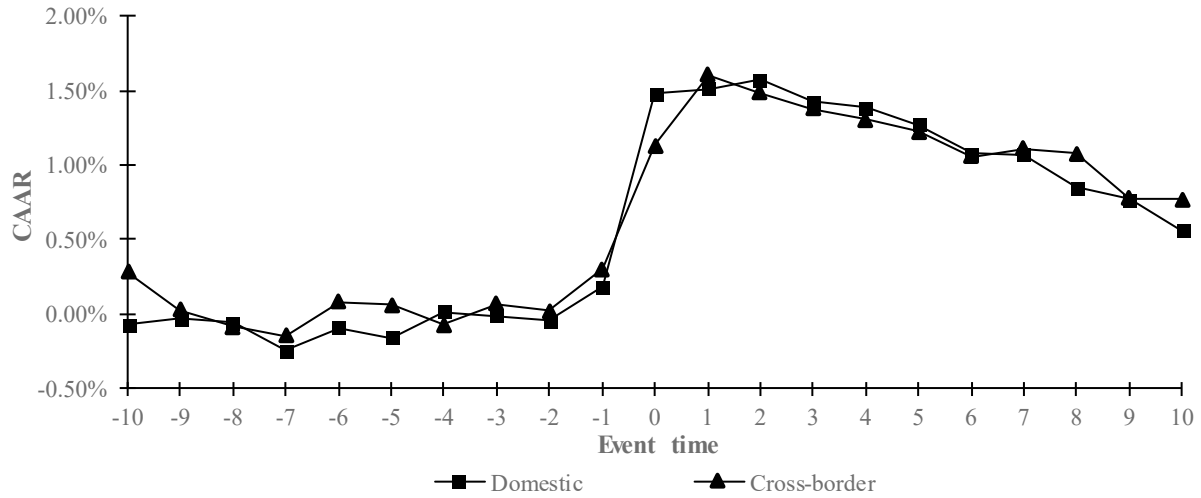
studies, both CAARs are experiencing a slight increase one day prior to the time of announcement indicating potential pre-leakage of information into the market. At first, the CAAR levels for domestic and cross-border acquisitions seem to be uniform, which challenges our previous stated hypothesis. To further examine whether this may be true, we discuss CAARs and associated test statistics for domestic and cross-border deals in the section below.

Firstly, when observing Table 3.9, the CAARs from domestic transactions show a partly increasing trend as the event window is narrowed. Furthermore, the significance level experiences the same relation where the level improves as the event window length decreases. The maximum window of 21 days results in a CAAR of 0.24%, but none of the three tests find it significant, which might be due to noise in the sample when broadening the window to this interval. When narrowing the event window down to 11 days, we now observe a CAAR of 1.50%, which is significant, based on all three tests. Specifically, the parametric tests, t-test and Kolari test, and the non-parametric test, rank test, all find the CAAR to be significant at a 1% level. This distinctive difference, when narrowing the event window down from 21 to 11 days further underlines potential noise when increasing the event window length. Next, for both the CAARs generated from the three- and five-day windows of respectively 1.53% and 1.46%, all three tests still find the values significant at a 1% level.

Secondly, the CAARs from announced cross-border deals are less significant compared to the CAARs from domestic deals. The broad event windows of 11 and 21 days seem to be affected by noise, since the two CAARs of respectively 1.08% and 0.80% are both tested to be insignificant, except for the t-test, which finds the CAAR of 1.08% from the 11-day window to be significant at a 5% level. However, since the two other tests find it insignificant and the fact that we find the t-test not as robust (explained earlier in this paper), we do not conclude the value to be acceptable, based on statistical significance. However, when narrowing the event window down to five days, which is the main range

Table 3.9
Event study results from cross-border acquisitions

Significance level indication: 1% - ***, 5% - **, 10% - *

Panel A: Domestic acquisitions					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.53%	377	5.986***	5.027***	5.631***
(-2;2)	1.46%	369	4.383***	3.691***	4.250***
(-5;5)	1.50%	372	3.076***	2.750***	3.284***
(-10;10)	0.24%	368	0.347	0.985	1.357
Panel B: Cross-border acquisitions					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.65%	226	6.414***	4.047***	5.207***
(-2;2)	1.68%	217	4.906***	3.175***	3.938***
(-5;5)	1.08%	224	2.183**	0.767	1.385
(-10;10)	0.80%	216	1.111	0.613	1.354

of the analysis, the CAAR of 1.68% is tested to be highly significant, based on all three tests. Precisely, the t-test, Kolari and rank test all find it significant at a 1% alpha. The same tendency is valid for the three-day window where the CAAR of 1.65% is tested to be significant at the same levels.

Finally, the two event studies of domestic and cross-border deals indicate that our stated hypothesis is negatively positioned, since the differences between the sizes of CAAR levels are fairly little. Furthermore, based on the five-day event window, the CAAR of cross-border transactions slightly exceeds the CAAR of domestic transactions with 0.22%-point, where both values are tested to be highly significant at a 1% level, based on all three test statistics. Again, this is not in line with the previous stated hypothesis, which will be further tested in the cross-sectional multiple regression analysis below.

To determine whether we have sufficient evidence for our stated cross-border hypotheses, we regress the effect from cross-border transactions related to bidder CAR. The hypothesis was stated, based on several American and European studies of cross-border acquisitions. For a more in-depth elaboration, we refer to the literature review section. Moeller and Schlingemann (2005) found significant evidence that domestic acquisitions outperformed cross-border acquisitions from an American perspective. Later, Martynova and Renneboog (2008) found a similar tendency based on domestic and cross-border acquisitions across Europe. However, other studies have found evidence that companies may gain value by entering new markets through cross-border acquisitions leaving the research within this area inadequate (Cakici et al., 1996; Danbolt & Maciver, 2012). Additionally, La Porta et al. (1998) established that the Nordic countries share the same degree of legal systems, but since Hofstede et al. (2010) outlined the significant cultural differences among Nordic countries, based on six cultural dimensions, we state the following hypothesis to be tested:

H$_{10}$: *Domestic acquisitions outperform cross-border acquisitions measured in abnormal returns*

Below, we present three different regression models where we test the cross-border dummy, which is equal to one if target country is different from bidder country. The three models are based on respectively three-, five- and 11-day event windows to further investigate the robustness of this regression analysis. When observing the output, we see that cross-border acquisitions are positively related to bidder CAR for all three models. However, they are all tested to be insignificant. In model (1) (CAR from three-day event window), the model suggests that cross-border transactions have 0.4%-point higher bidder return compared to domestic acquisitions. When broadening the event window to our main range of this analysis, five days, we observe a similar tendency where cross-border transactions have a positive effect of 0.6%-point, yet tested to be insignificant as well. Lastly, in the 11-day window, we interestingly note that cross-border transactions are tested to have no effect indicating that domestic and cross-border transactions generate the same level of bidder CAR. However, this is inconclusive since the variables are insignificant. In terms of the control variables, they are all in line with our expectations to their relation with bidder CAR, except for the leverage variable, however, it is tested to be insignificant. Interestingly, we observe the variable of relative firm size is tested to have no effect through all three regression models. In relation to previous regressions, variables of insider ownership, firm size, and partly, public targets are tested to be significant. In model (3), the 11-day event window, run up is tested to be significant at a 5% level with a noteworthy negative effect on bidder CAR, which is in line with previous studies on acquisitions made by listed companies (Golubov et al., 2015; Rosen, 2006).

Based on the regression analysis, cross-border transactions are tested to have an, unexpectedly, minor positive, but insignificant effect on bidder CAR related to Nordic acquisitions. Thus, we cannot determine whether this, contrary to expectations, indicates an inconsiderable difference between countries in the Nordic region. Previous results from other studies varies, indicating that our research area is inadequate and unfortunately, our findings are not positively contributing to this matter. In conclusion, we are not able to present sufficient evidence that domestic acquisitions outperform cross-border acquisitions measured in abnormal returns.

Table 3.10

Regression analyses on the effects from domestic and cross-border acquisitions

Robust t-statistics in parentheses. Significance level indication: 1% - ***, 5% - **, 10% - *

Variables of interest	(1) CAR[-1;1]	(2) CAR[-2;2]	(3) CAR[-5;5]
Cross-border dummy	0.004	0.006	0.000
	(0.996)	(1.299)	(0.077)
Control variables			
ln(Firm size)	-0.005***	-0.006***	-0.005**
	(-4.203)	(-3.496)	(-2.051)
Relative size	-0.000	0.000	0.000
	(-0.615)	(0.539)	(1.470)
Insider ownership	0.035*	0.056***	0.067***
	(1.771)	(2.872)	(2.739)
Leverage (D/E)	-0.010	-0.012	-0.005
	(-1.042)	(-0.995)	(-0.293)
Sigma	0.205	0.100	-0.001
	(1.030)	(0.358)	(-0.004)
Public target dummy	-0.033***	-0.018	-0.037*
	(-3.266)	(-1.407)	(-1.720)
Run up (BHAR)	-0.371	-2.902	-5.087**
	(-0.248)	(-1.346)	(-2.010)
Constant	0.058***	0.098***	0.113***
	(3.410)	(4.748)	(3.619)
Observations	603	586	596
Adjusted R-squared	0.114	0.120	0.051
Year FE	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes

3.7   Consideration type

In this part, we try to produce evidence regarding the effect payment methods of deals may have on bidder abnormal returns. The hypotheses we test are

H_{11}: *Deals completed with cash settlement outperform (show higher abnormal returns than) those completed with equity settlement*

H_{12}: *A negative effect on abnormal returns is expected from deals completed by companies with high valuation and payment with equity*

For the first hypothesis, we base our conclusions on both an event study and a subsequent regression analysis. We construct three dummy variables for this purpose, one for each type of consideration, i.e. all cash, all equity or a mix of cash and equity (the last of the three, mixed payment, is omitted in the regression analysis, since including it would introduce perfect multicollinearity. Thus, the dummies for all cash and all equity payments should be interpreted relative to the mixed payment method in the regressions). Next, for the second hypothesis, we need measures for the valuation of the bidding firm. For this purpose, we employ two metrics, namely the P/E-ratio of bidding firms and, as we already

employ a proxy for Tobin's Q in the cash flow test section, we also use this metric as a robustness check. In employing the P/E-ratio we generally follow the procedure of Sudarsanam and Mahate (2003), although we divide all events into two groups. We denote companies with a P/E-ratio higher than the median as highly valued and further include a continuous measure of the metric. We proceed likewise with Tobin's Q, denoting companies with a Q-value higher than one as highly valued and include a continuous measure of this variable too. Finally, we include interaction terms on the valuation variables and the equity payment dummy to capture the effect of this combination alone.

We see in the CAAR plot below some quite different results from what we would generally expect. Most noticeable is the huge curved shape trend of the equity-payment-only line. A positive trend starts already around event time $t = -9$ and peaks on the day following the event. We also notice that the absolute level of the CAAR for equity and mixed payments is substantially higher around the event, than for cash deals, which contradict our first hypothesis. The mixed payment group clearly exhibits the largest abnormal return on the event day itself, indicating that in general this is favoured by investors. What maybe surprises the most is the fact that the cash deals perform substantially below both pure stock exchange deals and mixed deals. We observe that cash deals generally show no signs of substantial abnormal returns prior to the event announcement, but increase sharply on the event day and further some on the following day, and afterwards exhibit more or less no trend at all, unlike the other two groups.

The CAARs and test statistics from Table 3.11 provide some further detail into the evidence from the CAAR plot. We see that the group with mixed payment clearly experiences the highest CAAR of all and that for all event windows, except $(-10; 10)$, the results are highly significant. The CAAR for cash deals also confirm the findings from the plot, that these experience the lowest abnormal returns and they in fact are significant at all window lengths, except the 21-day window. For the 11-day window, we

Figure 11. CAAR plot of deals by payment method
Source: Own creation
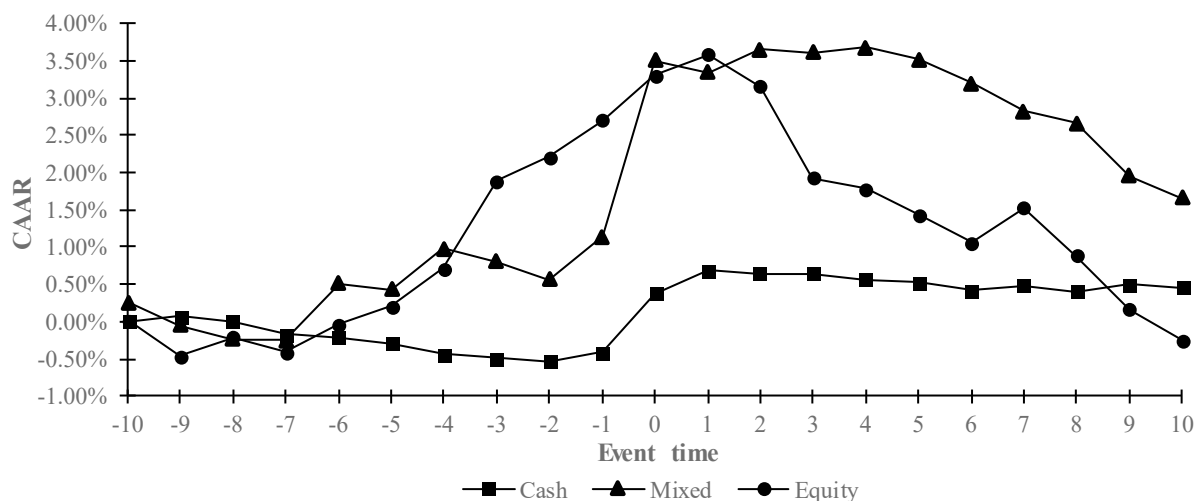
Table 3.11
Abnormal returns effects from consideration types

Significance level indication: 1% - ***, 5% - **, 10% - *

Panel A: Cash payment only					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.18%	412	5.881***	5.224***	6.555***
(-2;2)	1.14%	399	4.304***	3.871***	5.066***
(-5;5)	0.81%	408	2.132**	1.427	2.677***
(-10;10)	0.28%	400	0.507	0.681	1.471
Panel B: Equity payment only					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.80%	58	2.299**	1.008	2.313**
(-2;2)	1.61%	56	1.608	0.975	1.372
(-5;5)	1.61%	59	1.090	1.536	1.453
(-10;10)	-0.57%	56	-0.271	0.228	1.324
Panel C: Mixed payment					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	2.70%	133	5.811***	4.320***	3.572***
(-2;2)	2.74%	131	4.478***	3.127***	2.721***
(-5;5)	2.89%	129	3.216***	2.357**	1.828*
(-10;10)	1.41%	128	1.086	1.232	0.689

notice that the Kolari test is far from being significant, while both of the two other tests are significant at 5% and 1% respectively – thus we believe some cross-sectional correlation or additional event time volatility is present.

For the group with pure equity offers, we see that the CAAR levels generally fit in between the two other groups, except for the longest event window, which thus confirms the picture of the CAAR plot. It is also evident that close to none of the values is significant, except for the t-test and the rank test in the $(-1; 1)$ window. The Kolari test is, however, not nearly significant in this window, and thus it is hard to conclude that abnormal returns in pure equity payment deals are different from zero.

From the regression models presented in Table 3.12, we do not get much wiser regarding the differences between the three payment methods. From the first four regressions in the table, we observe absolutely no effect from the cash settlement dummy nor the equity settlement dummy. Likewise are the t-stats for all the related coefficients close to zero. In regressions (5) and (6) where we control for the valuation of the bidder by Tobin's Q, we see that the coefficient on equity settlement becomes highly positive, much higher than the cash only coefficient, and even significant at 5% in regression (5). This somewhat conforms to our event study results with the equity coefficient being higher than the cash coefficient, but it also exhibits a more positive effect than mixed payment, which the event study does

not show. In addition, the result is not very robust across the regressions and does not conform well to the theories, which we base our hypothesis on.

In relation to the second hypothesis however, the regressions reveal what we believe is quite compelling evidence. Across all the regressions (2) through (6) we see that the valuation have a positive, although extremely small, effect on CAR – using Tobin's Q, the effect is even significant at 5% and 10% respectively. The most interesting effect however, is found in the interaction terms. Using both

Table 3.12
Regression analyses on the effects from payment method in acquisitions

Robust t-statistics in parentheses. Significance level indication: 1% - ***, 5% - **, 10% - *

Variables of interest	(1) CAR[-2;2]	(2) CAR[-2;2]	(3) CAR[-2;2]	(4) CAR[-2;2]	(5) CAR[-2;2]	(6) CAR[-2;2]
Cash settlement	-0.000	-0.000	-0.000	0.000	0.001	-0.000
	(-0.027)	(-0.020)	(-0.025)	(0.027)	(0.165)	(-0.002)
Equity settlement	-0.001	-0.001	0.007	-0.001	0.034**	0.020
	(-0.116)	(-0.076)	(0.574)	(-0.110)	(2.523)	(1.364)
Price/Earnings ratio		0.000				
		(0.388)				
High valuation dummy (P/E > median)			0.005			
			(1.072)			
High P/E × Equity settlement			-0.031*			
			(-1.652)			
Tobins Q				0.000**	0.000**	
				(2.054)	(1.973)	
Tobins Q × Equity settlement					-0.017***	
					(-3.499)	
High valuation dummy (Tobins Q > 1)						0.013*
						(1.828)
High Q dummy × Equity settlement						-0.030*
						(-1.688)
Control variables						
ln(Firm size)	-0.006***	-0.006***	-0.006***	-0.006***	-0.005***	-0.006***
	(-3.280)	(-3.288)	(-3.209)	(-3.303)	(-2.992)	(-3.483)
Relative size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.525)	(0.511)	(0.503)	(0.600)	(0.744)	(0.551)
Insider ownership	0.056***	0.056***	0.055***	0.056***	0.052***	0.051***
	(2.850)	(2.831)	(2.881)	(2.881)	(2.786)	(2.707)
Leverage (D/E)	-0.012	-0.011	-0.010	-0.010	-0.012	-0.007
	(-0.928)	(-0.872)	(-0.787)	(-0.838)	(-1.018)	(-0.514)
Sigma	0.102	0.106	0.143	0.103	0.291	0.134
	(0.374)	(0.392)	(0.513)	(0.378)	(1.223)	(0.497)
Public target dummy	-0.020	-0.020	-0.020	-0.020	-0.023*	-0.020
	(-1.494)	(-1.479)	(-1.471)	(-1.474)	(-1.697)	(-1.517)
Run up (BHAR)	-2.921	-2.891	-3.055	-3.062	-1.872	-3.060
	(-1.324)	(-1.317)	(-1.363)	(-1.373)	(-1.057)	(-1.410)
Constant	0.100***	0.099***	0.099***	0.100***	0.094***	0.099***
	(4.353)	(4.348)	(4.299)	(4.322)	(4.153)	(4.343)
Observations	586	586	586	586	586	586
Adjusted R-squared	0.116	0.115	0.119	0.116	0.143	0.120
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes

P/E-ratio and Tobin's Q-ratio show that when bidding firms are highly valued and using equity as deal settlement type, CARs decrease, as expected, given the theories mentioned earlier. This is true both when using the high valuation dummies for P/E and Tobin's Q with both being significant at 5%, while using the absolute value of Tobin's Q, the coefficient is reduced, but the statistical significance is increased beyond the 1% level.

In sum, we do not believe we have any evidence to prove our first hypothesis that cash deals outperform equity settled deals. Our event studies show that both mixed and pure equity settlements are favoured by the market and the regression analyses do not make us much wiser, unless we include Tobin's Q in the model, which consequently more or less aligns the regressions with the event study. This is contrary to the theoretical framework, but it is noteworthy that this seems to be the conclusion for deals in Europe as argued by several studies (Goergen & Renneboog, 2004; Martynova & Renneboog, 2008). On the other hand, we believe that we present solid evidence on the fact that when highly valued companies engage in pure equity deals, abnormal returns diminish significantly, which is what the pecking order theory predicts.

3.8 Strategic rationales

Our first three hypotheses regarding strategic rationales were stated, based on Sudarsanam's (2010) theoretical work about economic and strategic M&A drivers. Firstly, he defines the revenue/sales enhancing motive with four value creating sources (e.g. network externality and increased market power) where this type of rationale is primarily related to horizontal mergers and acquisitions. As the word implies, these type of acquisitions are focused on increments in revenue/sales, i.e. through increase in market shares leading to profit growth (Sudarsanam, 2010). Secondly, he defines the cost rationale as a motive for achieving cost synergies. Economies of scale is an important part of this discussion, where companies engage in M&A to gain operational synergies in e.g. divisions such as R&D, marketing etc. However, to avoid diseconomies of scale, which might arise due to communication, control or monitoring problems, economy of learning can be utilised to offset potential setbacks from diseconomies of scale. Overall, based on economies of scale, Sudarsanam (2010) finds cost rationales to have a value creating effect. Lastly, the resource rationale is mainly related to the resource-based view where companies engage in M&A to achieve unique resources and capabilities to obtain/maintain a competitive advantage in the industry and thus increase shareholder value. This type of M&A is divided into path-dependent changes (existing capabilities) and path-breaking changes (non-existing capabilities). Thus, we have stated the following hypotheses to be tested:

H_{13}: *Deals announced with revenue enhancing motives experience positive abnormal returns*

H$_{14}$: *Deals announced with cost-saving motives experience positive abnormal returns*

H$_{15}$: *Deals announced with resource acquisition motives experience positive abnormal returns*

In relation to our stated hypotheses, we first present the CAARs and the associated test statistics related to the M&A rationales. Figure 12 illustrates the CAARs during event time generated from announced deals where management has reported acquisition rationales of either enhanced revenue, cost savings or inflow of resources. Interestingly, the CAARs from the three different rationales are distributed differently during the event time before announcement. The CAARs related to the resource rationale are negative until announcement date, whereas those related to the sales rationale are around zero and finally abnormal returns related to the cost rationale are positive and strangely, increasing prior to announcement. As described in some of the previous analyses, here we also find a slight increase in CAAR for all three deal rationales starting one day prior to the announcement day, questioning whether potential pre-leakage of information into the market takes place. Next, we see considerable differences in the development of the different CAARs after the time of announcement. Firstly, abnormal returns generated from deals, based on sales motives are experiencing a noteworthy increase during the period following the event announcement. Secondly, abnormal returns related to resource motives experience a fluctuating development. Lastly and surprisingly, abnormal returns generated from deals, based on cost savings seem to decrease shortly after announcing the given transactions following the whole event time. Below we discuss each CAAR and the associated test statistics for each M&A rationale.

Sales is the rationale generating the highest CAAR, based on the five-day event window cf. Table 3.13, compared to cost and resource rationales. In the 21-day event window CAAR reaches 0.74%. However, all three test statistics find it insignificant. When narrowing the window down to 11 days,

Figure 12. CAAR plot of deals by strategic rationale
Source: Own creation
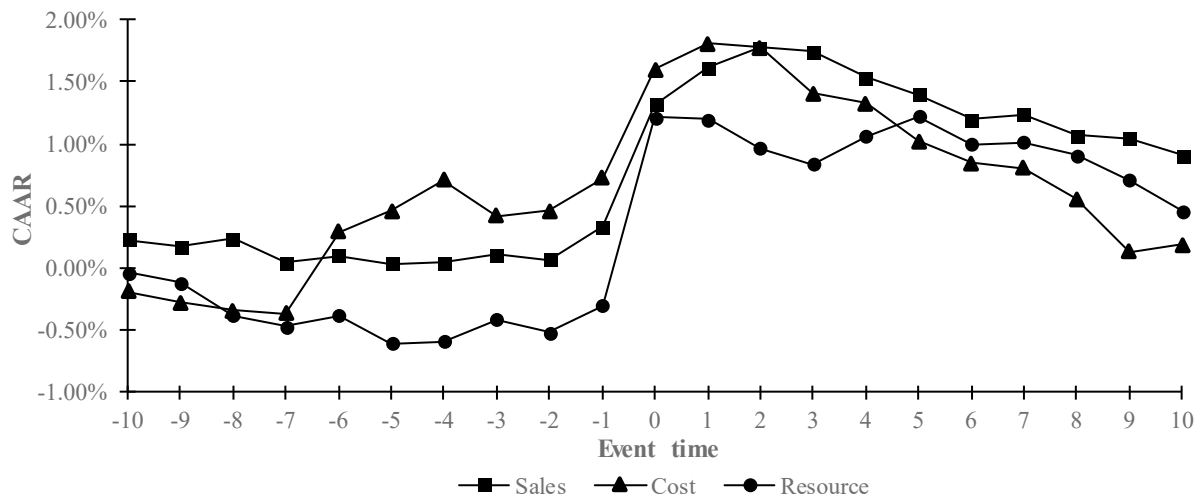
CAAR increases to 1.41% and all three tests now find it significant, i.e. the t-test finds it statistically significant at a 1% level, Kolari test at 10% and rank test at 1%. This trend continues as the event window is further narrowed, where the five-day window shows a CAAR of 1.64% significant at 1% level. The same goes for the three-day CAAR of 1.56%. Therefore, we conclude that noise in the sample seems to appear when increasing the event window length to 21 days.

Next, the cost rationale experiences the same CAAR size development where it increases as the event window is being narrowed. Furthermore, as illustrated by Table 3.13, this rationale generates the lowest CAAR compared to the two other rationales. Interestingly, when observing the results from the 21-day event window, the CAAR is negative with -0.44% indicating that completed deals, where cost synergies are the motive behind, lead to negative returns. However, when performing the three test statistics, all find the CAAR value to be insignificant. The same is evident for the 11-day window, where CAAR is now positive with 0.66%, but still statistically insignificant. The result from the five-day window, which is the main range of this analysis, shows a CAAR of 1.22% significant at a 5% level, based on the Kolari test and the t-test, whereas the rank test finds it significant at a 10% level. Finally, the three-day window shows the same tendency with a CAAR of 1.30% where the Kolari test finds it significant at a 5% level and the t-test and rank test find the same at a 1% level. Overall, we find only the CAARs from the five-day and three-day windows to be significant and relevant in this paper.

Lastly, announced deals where the management has presented resource-based motives as the main reason, seem to generate minor fluctuating abnormal returns across all four different event windows. When broadening the event window to 21 days, the CAAR is 0.48%, but none of the three statistic tests finds it significant. The CAAR at the 11-day window is increased to 1.67% significant at a 10% level, based on the Kolari test, and significant at a 5% level, based on the rank test and t-test. Next, the significance level increases as the window is narrowed. In continuation of this trend, the CAAR in the five-day window is measured to be 1.57%. Now, both the t-test and rank test find it significant at a 1% level, whereas the Kolari test finds it significant at a 5% level. Lastly, the CAAR from the three-day window is measured to be 1.79% and found significant at a 1%, based on all three test statistics.

From the results defined above, we interestingly conclude that announced deals with sales enhancing, cost saving or resource inflow rationales generate positive significant CAARs from 1.22% to 1.64%, based on a five-day event window, which is our main range.

Now, we test our findings related to strategic rationales in a multiple regression model to determine the robustness of the event study evidence for our stated rationale hypotheses. Below, we present six regression models where we test the three different rationale dummies that are equal to one if bidder's deal rationale is enhanced revenue/sales, cost savings or inflow of resources, respectively. Furthermore, we include a related acquisition dummy, which is equal to one if the six-digit GICS code is the same for target and bidder firm. All models are based on CARs observed in the five-day event window.

Table 3.13
Event study results from different rationales

Significance level indication: 1% - ***, 5% - **, 10% - *

Panel A: Sales rationale					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.56%	289	5.660***	4.686***	6.187***
(-2;2)	1.64%	283	4.614***	3.548***	4.895***
(-5;5)	1.41%	286	2.660***	1.911*	2.819***
(-10;10)	0.74%	282	0.980	1.150	1.450
Panel B: Cost rationale					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.30%	125	3.400***	2.461**	3.386***
(-2;2)	1.22%	122	2.429**	1.993**	1.885*
(-5;5)	0.66%	122	0.891	0.553	0.477
(-10;10)	-0.44%	120	-0.420	0.225	0.316
Panel C: Resource rationale					
Event window length	**CAAR**	**N**	**t-test**	**Kolari test**	**Rank test**
(-1;1)	1.79%	175	5.007***	3.862***	3.628***
(-2;2)	1.57%	168	3.288***	2.489**	2.824***
(-5;5)	1.67%	174	2.524**	1.870*	2.237**
(-10;10)	0.48%	168	0.477	0.396	1.162

In the analysis related to the first three rationale hypotheses, we focus on regression models (1), (3) and (5). The remaining models are included in the discussion of the last hypothesis. When observing the output of models (1), (3) and (5), we see that deal announcements where revenue/sales is the underlying motive are positively related to bidder CAR with a coefficient of 0.7%. This is in line with Walker's findings (2000) where he analysed strategic rationales, based on six different categories. Two of those, which were found to generate positive abnormal returns, are related to revenue/sales motives. The coefficient is tested to be insignificant, but the t-statistic is not far from the 10% level critical value. Surprisingly, when conducting the regression analysis, we find deal announcements where cost synergies/savings is the underlying motive to be negatively related to bidder CAR with -1.0%-points. Furthermore, we find this to be significant at a 10% level, thus being applicable as evidence against our cost hypothesis. This result deviates from previous studies that test cost synergies to generate positive abnormal returns (Ghosh, 2004; Sudarsanam, 2010). Lastly and unexpectedly, transactions announced with inflow of resources as the underlying motive are tested to be negatively related to bidder CAR with -0.1%-points. When relating this tendency to the value creation findings of Madden et al. (2006), which focus on the brand-driven aspect of resource acquisitions, we get incongruous results. However, the t-statistic of our result is far from a critical value classifying the coefficient to be highly insignificant. As found in some of the other regression models, we find the control variables to be related to bidder CAR

as expected, except for the leverage variable, across all six models. Furthermore, firm size and insider ownership are tested to be significant where the t-statistics of public target and run up are close to significant critical values.

Based on the analysis, deal announcements with sales and resource rationales are tested to have a respectively positive (0.7%-point) and negative (-0.1%-point) effect on bidder CAR. However, both coefficients are insignificant. Therefore, looking at the regressions, we are not able to present sufficient evidence that deals announced with revenue enhancing or resource acquisition motives experience a positive value creation effect. Next, we test deal announcements with cost rationale to have a negative effect of -1.0%-points on bidder CAR, significant at a 10% level. Thus, we are able to present evidence that our stated hypothesis, about deals announced with cost-saving motives experience a positive value creation effect, is not valid.

Following, Doukas et al.'s examination (2002) of Swedish companies and their diversifying acquisitions, which were found to generate negative bidder returns, we want to integrate the industry relatedness aspect to the revenue and cost rationales. Therefore, we also stated the following hypothesis:

H_{16}: *Deals announced with revenue increasing or cost-saving motives and in related*
industries experience higher abnormal returns than those in unrelated industries

Observing regression models (2), (4) and (6) below, we find the coefficient values to be merely the same for all three rationale types deviating with only 0.1%-point for the sales and resource rationales. Suggestively in model (2), the revenue/sales rationale is positively related to bidder CAR with 0.8% and is tested to be insignificant, but the t-statistic of the variable is only 0.001 from being significant at a 10% level. For all three models, we observe that related acquisitions have a negative effect of -1.1%-point on bidder CAR, tested to be significant at a 5% level for all three rationales. We find this outcome surprising, since it indicates a reversed relationship towards bidder CAR than found in Doukas et al.'s study (2002) of Swedish companies. In conclusion, as the related acquisition variable is significant for all three models, we find sufficient evidence that related acquisitions are negatively related to bidder CAR, while only the cost rationale exhibit a statistically significant relationship with bidder abnormal returns. Thus, we are not able to present sufficient evidence for our stated hypothesis: deals announced with revenue increasing or cost-saving motives and in related industries experience higher CARs than those in unrelated industries, but instead we find the opposite.

Table 3.14
Regression analyses on the effects from strategic rationales

Robust t-statistics in parentheses. Significance level indication: 1% - ***, 5% - **, 10% - *

	(1) CAR[-2;2]	(2) CAR[-2;2]	(3) CAR[-2;2]	(4) CAR[-2;2]	(5) CAR[-2;2]	(6) CAR[-2;2]
Variables of interest						
Rationale (Sales/growth) dummy	0.007	0.008				
	(1.535)	(1.644)				
Rationale (Cost) dummy			-0.010*	-0.010*		
			(-1.833)	(-1.803)		
Rationale (Resource) dummy					-0.001	-0.002
					(-0.194)	(-0.296)
Related acquisition		-0.011**		-0.011**		-0.011**
		(-2.235)		(-2.138)		(-2.182)
Control variables						
ln(Firm size)	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***
	(-3.400)	(-3.593)	(-3.476)	(-3.647)	(-3.376)	(-3.552)
Relative size	0.000	-0.000	0.000	-0.000	0.000	0.000
	(0.525)	(-0.000)	(0.457)	(-0.030)	(0.548)	(0.039)
Insider ownership	0.056***	0.052***	0.056***	0.052***	0.056***	0.052***
	(2.859)	(2.650)	(2.931)	(2.725)	(2.875)	(2.667)
Leverage (D/E)	-0.014	-0.014	-0.012	-0.012	-0.012	-0.012
	(-1.145)	(-1.160)	(-0.966)	(-0.967)	(-0.971)	(-0.988)
Sigma	0.108	0.048	0.084	0.027	0.103	0.046
	(0.390)	(0.177)	(0.304)	(0.098)	(0.366)	(0.166)
Public target dummy	-0.020	-0.020	-0.019	-0.020	-0.020	-0.021
	(-1.554)	(-1.581)	(-1.483)	(-1.510)	(-1.567)	(-1.595)
Run up (BHAR)	-2.982	-3.284	-3.057	-3.336	-2.898	-3.186
	(-1.386)	(-1.535)	(-1.427)	(-1.564)	(-1.331)	(-1.470)
Constant	0.100***	0.106***	0.101***	0.106***	0.100***	0.106***
	(4.842)	(5.080)	(4.863)	(5.078)	(4.790)	(5.013)
Observations	586	586	586	586	586	586
Adjusted R-squared	0.122	0.129	0.123	0.129	0.118	0.125
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes

4 Discussion

In this section, we discuss the interpretation, delimitations and potential implications of our findings. Furthermore, we discuss our findings in relation to prior research within the field and next, try to present a few M&A guidelines in a perspective relevant for the industry and related professionals.

Overall, we find it reasonable to conclude that on average, acquiring companies within the Nordic countries do in fact create additional value for their shareholders in the short-term. The level of value creation is generally also in line with many previous studies on the matter. Turning to the overview presented by Table 2, Panel C of Martynova and Renneboog (2008) of most recent takeover studies, we see our results fitting within the boundaries of the previous research, without consideration to geographical limitations. The five-day CAAR of 1.54% (see Table 3.1) that we find, is ranked somewhere within the upper range of the aforementioned research overview. Compared to the statistical significance presented in Martynova and Renneboog (2008), our findings generally also agree with previous results. Somewhat surprisingly, most research find statistical evidence at a 1% level of abnormal returns (in both negative and positive directions), while only minor parts only show 5% and 10% significance levels.

Holmen and Knopf (2004) and Doukas et al. (2002) are as mentioned earlier two studies based on Swedish empirical findings. The former find a 0.32% bidder CAAR based on a $(-5; 5)$ window, but not significant at any level. In shorter time windows, they find even lower CAARs, but still no significant results. The latter do not present an aggregate level of bidder returns, but separate findings into focused and diversifying acquisition. In focused acquisitions, they show strong positive CAAR of 2.74%, significant at a 1% level, while diversifying deals show negative CAAR, significant at a 10% level (both in a $(-5; 5)$ window). In the light of our research on rationale effects, this is interesting, since we find complete opposite results, to say the least. Since we believe our results are highly comparable to those of Doukas et al. (2002) with regards to the effects from related versus non-related acquisitions, this is probably an area that would benefit from more research. Thus, the few studies within the Nordics present somewhat mixed results. While the negative findings of Holmen and Knopf (2004), related to CAAR, are somewhat inconclusive, our findings are noticeably higher and more significant. Our results are generally more in line with the level of those presented in Doukas et al. (2002), concluding that there in fact may be value creation for the bidder, at least in some acquisitions.

In this thesis, we suggest potential implications based on our analysis of bidder returns in the Nordic region. The effects from announcements include investors' view on deal uncertainty where a potential takeover reluctance of target further complicates the isolation of the market's interpretation of the event. Next, two factors may lead to insignificant announcement effects even though an M&A event takes place (Fuller et al., 2002). Firstly, if the bidder company has stated in their strategy that it will engage in inorganic growth opportunities, then the market is already aware of possible future acquisitions, which

could be reflected in the share price leading to minor reactions. Secondly, we illustrate that a smaller part of our sample are characterised by noteworthy relative size ratios. This might be an issue as abnormal returns are based on the share price reaction, and these transactions where bidder is considerably larger than target could result in a small impact on bidder's share price regardless of how good the M&A event is.

Next, Hietala et al. (2003) found that M&A announcements indicate certain information regarding synergies and value of merged entity and separate companies. As they find it highly difficult to measure the market effect of announcements due to the uncertainty effect, they find it only possible to determine the market's inference in two situations: 1) when the acquisition consists of one target and two competing bidders, where the market knows with certainty that target will be acquired; and 2) when there is a failed acquisition attempt by a bidding company. Thus, they have constructed a model that uses reactions in share prices to measure the market's estimate of potential synergies and overvaluation, but only in the two above situations. Compared to our event study, their model focuses on the time when all final bidders have made their definitive offers (market valuation of different outcomes) and the time where management announces the outcome of biddings and negotiations. This model appears as an interesting alternative/supplement in the measurement of market reactions to acquisition announcements as it decreases the uncertainty effect.

When considering the results and conclusions from our analyses, we reflect on the generalisability in terms of unlisted companies. As argued by Faccio et al. (2006), acquisitions of unlisted targets create significantly more value than acquisitions of listed targets due to the listing the effect. However, is there a significant difference between listed and unlisted bidders? We believe that several of the value drivers presented in this paper are relatable to mergers and acquisitions by unlisted bidder companies. Nevertheless, as M&A activities performed by unlisted bidders often are announced at/around completion, the full value would be measured due to the elimination of the uncertainty effect, which is the case for listed bidder companies that often announce M&A activities before completion. Thus, we may assume a higher bidder return would be revealed in an unlisted perspective. However, an alternative value measurement technique would have to be employed, as share prices are not available for unlisted bidders of course.

While we present CAARs for multiple event window lengths, practically all our regressions are based on our main event window length of five days, or the $(-2; 2)$ window. This is something the reader should have in mind, since this reduces the generalisability of our findings somewhat. For further research, we would like to see inclusion of multiple event windows in regressions analysis and see if this changes the preliminary results presented in this thesis. We would however be somewhat surprised if our conclusions were altered much by such a change in the dependent variable, at least for short-term effects. How much this limits the comparability of our findings to other studies overall, is discussable

though. Since there is no "correct" event window length, it is open to interpretation and at the discretion of further Nordic research to employ alternative window lengths in regressions and thus compare results. Next, we also find it noteworthy to mention that our analyses are based on deals above EUR 5 million, which means that we really cannot make any definitive conclusions regarding deals with transaction values below EUR 5 million and deals with non-disclosed values. For example, Goergen and Renneboog (2004), who survey only large deals with values above EUR 90 million and test for differences between method of payment, suggest that their results may be biased since large deals often are more likely to use equity payment, while cash settlement is more easily available in small deals. Thus, other results might appear if all deals, including deals with undisclosed values and below EUR 5 million were included, although we do not expect any major changes from this.

Finally, we present a short discussion of our findings in a Nordic M&A guideline perspective, based on what we believe is relevant for the industry and related professionals. As we have illustrated in this thesis, not all mergers and acquisitions create value for the shareholders of acquiring companies, but on average our results show that value creation is positive. Based on the event studies and regression coefficients tested to be significant, we recommend: 1) companies with abundant cash flows and limited investment opportunities to not make acquisitions as this will have a negative effect on shareholder value; 2) acquiring companies to hire an M&A adviser to assist with the transaction. More specifically, a non-top-tier adviser; 3) highly valued companies not to use equity settlement when acquiring targets; 4) companies, which consider acquisitions based on cost saving motives, to reconsider, as this will have a negative impact on shareholder value. In addition, we recommend bidders to acquire targets in non-related industries.

Thus, in relation to our first recommendation, we cannot however rule out that a potential promising target could appear which might be interesting for a company with high cash flows and low investment opportunities (e.g. new competitor disrupting the industry). Consequently, our general recommendation is, for these bidders in question, to be well-considered before engaging in acquisitions, as it is possible, that in some cases it might be even more value destructive to not engage in acquisitions. However, the essential issue that needs to be underlined for acquiring companies is the associated principal-agent problems, where revised payout policies may be of interest to eliminate shareholder value destruction (Jensen, 1986; Lang et al., 1991).

Our second recommendation is based solely on a value perspective as the other recommendations. Firstly, in the event study, we found non-top-tier advisers to have the largest positive and significant impact compared to top tier advisers and no external advice. Secondly, we found total top-tier advisers to have a significant negative impact on bidder returns indicating that bidders should go with non-top-tier advisers. However, other factors may challenge our recommendation indicating that value is not the sole benchmark within this area. As previously stated, top-tier advisers may have the capabilities and

experience to carry out the given transaction faster than non-top-tier advisers. In addition, they may also have sector experts within given industries, who could be critical during transactions that require specific competences and sector know-how (e.g. biotechnology, information technology or energy) (Golubov et al., 2012). We also acknowledge the fact that some of the non-top-tier advisers presented in our league tables are pure M&A advisers, which is in contrast to full-service investment banks. The latter often provide services, advisory and underwriting in relation to equity capital markets, debt transactions and other peripheral services often requested in large and complex situations.

The third recommendation, based on a value perspective, is in line with previous studies, as the market may perceive equity settlements as management's view of overvalued shares (Brealey et al., 2017). However, the event studies illustrate that equity and mixed settlements are preferred by the market in general where the regression analyses do not contribute with relevant indications for further discussion. Conversely, other practical factors may lead to other indications. As equity settlements may involve regulatory approvals and stock market transactions, cash may be in favour if transaction speed is considered critical (e.g. to avoid bids from competitors). Furthermore, targets are affected differently depending on the type of settlement as cash may lead to tax liabilities, while equity carries the risk of bidder's share price to decline (D. K. Datta et al., 1992).

The last recommendation is surprising as: 1) Sudarsanam (2010) found cost synergies to be generally easier to measure compared to sales synergies, hence cost synergies should be easier to communicate to shareholders. However, this seems not to be the case based on our findings; and 2) related acquisitions are previously tested in Sweden to have a positive significant impact on shareholder value (Doukas et al., 2002). Lastly, we need to emphasise that acquisitions announced with sales/revenue enhancing motives have a positive effect on bidder return, which is tested to have a t-statistic 0.001 from being significant at 10%. Thus, we cannot include a recommendation related to this rationale, however, it should be included in further discussions. Further, we recommend that management in an acquiring company to be well-considered in the way they communicate their motives to the company's shareholders. As we already have touched upon, we classify each deal based on one motive only, and this of course introduces subjectivity in the analysis. A further investigation of the announced motives could thus prove to be informative.

As the efficient market hypothesis (EMH) is central when conducting event studies, we find it important to discuss potential implications from a perspective related to Fama (1970). Firstly, as the assumption of efficient markets is essential, we need to emphasise that our results are only valid as long as the EMH is fulfilled. Secondly, if the weak form is present, only historical information will be reflected in share prices implicating our event study, since the effect from M&A announcement will not be incorporated in the share price immediately. Thirdly, if the semi-strong form is present, our event study will be valid as historical and public information is reflected in share prices indicating that effects

from acquisition events will be incorporated at announcement date. Lastly, if the strong form is present, our event study will not be valid as all information, i.e. historical, public and inside will be reflected in share prices. Thus, the effect from M&A would already be incorporated in the share price before announcing the event to the market.

4.1 Further research

Based on research performed in this thesis, we believe that we have presented sufficient evidence of value creation by Nordic acquiring companies and illustrated relevant underlying value drivers. However, to maintain a consistent and valid analysis, delimitations have been essential. Thus, in this section, we discuss other relevant research areas to advance the research field of Nordic M&A.

An interesting and supplementing approach to further measure value creation through M&A in the Nordic region would be from a long-term shareholder value perspective. As discussed in the delimitations section, long-term event studies encounter several difficulties such as separating the M&A effect from other strategic, operational or financial aspects. In addition, the performance of the analysis benchmark is often experiencing statistical or measurement issues (Martynova & Renneboog, 2008). However, Barber and Lyon (1997) made an analysis of test statistics related to long-term event studies. They found that by matching a portfolio of companies of similar sizes and book-to-market ratios with bidders and targets before M&A announcement, the measurement of benchmark returns improves. Thus, we recommend this approach for a potential study of long-term shareholder value creation by Nordic listed bidder companies.

A noteworthy research area that has received less attention is the underlying drivers that activate the decision process management faces to determine potential M&A activity (e.g. acquisitions, mergers, spin-offs etc.). The drivers may be non-economic such as management's educational background, compensation or professional/organizational networks. As the research is limited in this area, further examination both in a Nordic and European perspective is encouraged.

Finally, a perspective that would be interesting in the value discussion is to widen the scope to include stakeholder value effects from mergers and acquisitions (e.g. customers, suppliers, managers or debtholders). Additionally, which stakeholders would achieve potential value? The main part of M&A research is focused on shareholders from either a bidder, target or combined perspective. This may be related to finance theory that perceive shareholder value as the focal point, since shareholders are definitive owners of the companies. Thus, we think this is an interesting perspective to investigate. The research could be done both in a Nordic or European perspective. However, a Nordic perspective would be interesting as Holmen and Knopf (2004) indicate that extra-legal institutions (social norms, tax compliance and media) in Sweden have a significant impact on M&A activity.

5 Conclusion

In this thesis, we try to uncover whether acquiring companies within the Nordic countries of Denmark, Sweden, Norway and Finland create short-term shareholder value when announcing new acquisitions. Following, we further try to establish empirical evidence on what drives these potential increases in shareholder value gained from acquisitions.

As our starting point, we argue that abnormal returns are the best measure for the value created through M&A and that value is created when abnormal returns are positive. We employ a uniquely compiled dataset resulting in a final sample of 627 events. We investigate our dataset for several problems and sources of noise, where thin trading and clustering in particular are discussed. We use two methods in analysing the data. Firstly, we use an event study as our main method and the results from this method are used as the main evidence in relation to our problem statement. Secondly, we use cross-sectional regressions on the event study results to increase robustness and further analyse the value drivers and hypotheses.

Overall, we find significant results indicating that on average, acquiring firms within the Nordics do in fact create short-term value when announcing new acquisitions. Our main event window of five days indicates a positive cumulative average abnormal return to bidding companies' shareholders of 1.54%, showing high statistical significance beyond 1%. Other narrow event windows show close to the same level of positive returns and the same statistical significance, but when moving beyond an 11-day window, the effect declines, as does the statistical significance. In a following discussion of this result, we conclude that this level of return is generally in the upper range of what previously has been found in similar studies.

In relation to the value drivers of the value creation discovered above and our additional research questions, we find the following. Subsequent to Jensen's cash flow hypothesis (1986), we test two different cash flow measures: a Cash Flow proxy and the reported cash flow from operations, respectively. We find both to be negatively correlated with abnormal returns and tested to be insignificant, resulting in no evidence for our first cash flow hypothesis. Next, we introduce Tobin's Q as a benchmark for investment opportunities and find significant evidence, that high bidder cash flow and low investment opportunities affect bidder returns negatively.

As M&A activity seems to be concentrated in peak periods within sectors, which is correlated with stock markets trading at high levels, we discover eight merger waves in four different sectors. We analyse and test announcements in- and outside merger waves. In the event study, we find both to have significant and positive abnormal returns, but in the regression analysis we find that all seven models indicate a positive relationship between announcements within merger waves and bidder returns. However, none of the coefficients is statistically significant. Thus, we cannot conclude that acquisitions within merger waves lead to lower bidder returns compared to acquisitions outside merger waves.

When we test for organisational learning and potential hubris effects by investigating frequent acquirers and their deal similarities, we find it hard to give any definitive conclusions. Our event study shows that non-frequent acquirers certainly create positive abnormal returns, while frequent acquirers do not, although the latter does not exhibit statistical significance. We find some evidence however, that firms with a high fraction of acquisitions within the Nordics experience lower abnormal returns.

Next, a test of the effects that financial advisers have on abnormal returns is conducted. We show quite compelling evidence on, that financial advisers do increase bidder abnormal returns. In fact, when non-top-tier advisers are employed, on average, bidders experience an increase in abnormal returns of 2.46%, while using top-tier advisers, the effect is drastically reduced. We also show that when bidders use financial advisers in acquiring public companies, abnormal returns increase drastically. We cannot back this with statistical significance, but it is in line with previous research. Finally, we find some evidence in favour of Nordic based top-tier advisers seeming to outperform non-Nordic based top-tiers in our regressions.

Then, we test the effects from domestic and cross-border transactions. We find cross-border announcements to be marginal, but positively related to bidder returns indicating that the difference between Nordic countries is not considerable. However, as the results are not statistically significant, we cannot conclude that domestic acquisitions outperform cross-border acquisitions.

The type of payment, i.e. stock, cash or a mix, in M&A is also a debated subject, which we further test within the Nordics. In sum, we present two conclusions. Firstly, we cannot empirically confirm the theory, which predicts that in general, cash offers should equal higher bidder returns. Instead, our event study and some regressions show that equity and mixed payments are highly preferred by investors, with some variance in the statistical significance. Secondly, we do however provide solid evidence on the fact that bidding companies with high valuations, which pay with equity only, experience a significantly negative effect on abnormal returns, as predicted by theory.

Lastly, we analyse and test three types of strategic rationales (sales, cost and resource) behind acquisitions. Sales rationales are positively correlated with bidder returns, whereas resource and cost rationales have negative impacts. However, only the last-mentioned exhibits statistical significance. When we include a variable to explain the effect from related acquisitions on bidder returns, we find a significant, but negative effect, indicating that acquisitions of targets in same industries are value decreasing. Thus, we cannot present sufficient evidence that transactions announced with sales or resource rationales experience a positive effect on bidder return. The same tendency exists for our other hypothesis: transactions announced with sales or cost rationales and in related industries experience higher abnormal returns than those in unrelated industries. Finally, we present evidence that our hypothesis: transactions announced with cost rationales experience a positive value creation effect, it not valid.

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Appendices

Appendix A

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
AB Fagerhult (OM:FAG)	4-Feb-2005	Sweden	Domestic	Industrials
AcadeMedia AB (publ) (OM:ACAD)	12-Sep-2017	Sweden	Domestic	Consumer Discretionary
Acando AB (publ.) (OM:ACAN B)	9-Jun-2014	Sweden	Domestic	Information Technology
Acando AB (publ.) (OM:ACAN B)	5-Sep-2013	Sweden	Cross-border	Information Technology
Acando AB (publ.) (OM:ACAN B)	14-Sep-2007	Sweden	Cross-border	Information Technology
Acrinova AB (publ) (XSAT:ACRI)	21-Sep-2016	Sweden	Domestic	Real Estate
AddNode AB (nka:Addnode Group AB (publ))	9-Nov-2005	Sweden	Domestic	Information Technology
Addnode Group AB (publ) (OM:ANOD B)	2-Jul-2013	Sweden	Cross-border	Information Technology
Addnode Group AB (publ) (OM:ANOD B)	15-Nov-2010	Sweden	Domestic	Information Technology
Addnode Group AB (publ) (OM:ANOD B)	30-Aug-2006	Sweden	Domestic	Information Technology
Addtech AB (publ.) (OM:ADDT B)	29-Mar-2007	Sweden	Cross-border	Industrials
Addtech AB (publ.) (OM:ADDT B)	4-Feb-2005	Sweden	Domestic	Industrials
Addtech Life Science AB	4-Jun-2015	Sweden	Domestic	Healthcare
AF Gruppen ASA (OB:AFG)	21-Oct-2016	Norway	Cross-border	Industrials
AF Gruppen ASA (OB:AFG)	18-Dec-2014	Norway	Domestic	Industrials
AF Gruppen ASA (OB:AFG)	8-Jul-2011	Norway	Domestic	Industrials
AF Gruppen ASA (OB:AFG)	31-Oct-2007	Norway	Domestic	Industrials
Afarak Group Oyj (HLSE:AFAGR)	31-Mar-2004	Finland	Domestic	Materials
Affecto Oyj (HLSE:AFE1V)	20-Dec-2016	Finland	Domestic	Information Technology
Affecto Oyj (HLSE:AFE1V)	28-Nov-2006	Finland	Cross-border	Information Technology
Ahlsell AB (publ) (OM:AHSL)	22-Jun-2017	Sweden	Domestic	Industrials
Akastor ASA (OB:AKA)	10-Oct-2012	Norway	Domestic	Energy
Akastor ASA (OB:AKA)	29-Jun-2011	Norway	Domestic	Energy
Akastor ASA (OB:AKA)	2-Apr-2009	Norway	Domestic	Energy
Akastor ASA (OB:AKA)	2-Apr-2009	Norway	Domestic	Energy
Aker ASA (OB:AKER)	1-Jul-2005	Norway	Domestic	Financials
Aker BP ASA (OB:AKERBP)	24-Oct-2017	Norway	Domestic	Energy
Aker BP ASA (OB:AKERBP)	16-Nov-2015	Norway	Domestic	Energy
Aker BP ASA (OB:AKERBP)	14-Oct-2015	Norway	Domestic	Energy
Aker BP ASA (OB:AKERBP)	9-Oct-2007	Norway	Domestic	Energy
Aktia Bank p.l.c. (HLSE:AKTAV)	24-Oct-2013	Finland	Domestic	Financials
AKVA Group ASA	28-Oct-2016	Norway	Domestic	Industrials
AKVA Group ASA	23-Dec-2015	Norway	Domestic	Industrials
AKVA Group ASA (OB:AKVA)	9-Jul-2015	Norway	Cross-border	Industrials
AKVA Group ASA (OB:AKVA)	14-Mar-2008	Norway	Domestic	Industrials
Alcadon Group AB (publ) (OM:ALCA)	1-Nov-2016	Sweden	Domestic	Information Technology
Alfa Laval AB (publ)	21-Dec-2010	Sweden	Cross-border	Industrials
Alfa Laval AB (publ) (OM:ALFA)	7-Apr-2014	Sweden	Cross-border	Industrials
Alfa Laval AB (publ) (OM:ALFA)	21-Dec-2010	Sweden	Cross-border	Industrials
Alfa Laval AB (publ) (OM:ALFA)	9-Nov-2007	Sweden	Cross-border	Industrials
Alimak Group AB (publ) (OM:ALIG)	5-Dec-2016	Sweden	Cross-border	Industrials
Allgon AB (publ) (OM:ALLG B)	21-Mar-2000	Sweden	Domestic	Information Technology
ALM Equity AB (publ) (OM:ALM)	8-Feb-2017	Sweden	Domestic	Real Estate
Alm. Brand A/S (CPSE:ALMB)	6-Mar-2002	Denmark	Domestic	Financials
Alm. Brand Bank A/S	5-Feb-2018	Denmark	Domestic	Financials
Alma Media Oyj	10-Aug-2009	Finland	Domestic	Consumer Discretionary
Alma Media Oyj (HLSE:ALMA)	29-Sep-2015	Finland	Domestic	Consumer Discretionary

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Altero AB (publ)	16-Feb-2007	Sweden	Domestic	Information Technology
Ambu A/S (CPSE:AMBU B)	12-Mar-2001	Denmark	Domestic	Healthcare
Amer Group plc (nka:Amer Sports Corporation)	1-Oct-1999	Finland	Domestic	Consumer Discretionary
Apetit Oyj (HLSE:APETIT)	27-Mar-2012	Finland	Domestic	Consumer Staples
Apetit Oyj (HLSE:APETIT)	6-Feb-2007	Finland	Cross-border	Consumer Staples
AQ Group AB	13-Sep-2004	Sweden	Domestic	Industrials
AQ Group AB (publ) (OM:AQ)	18-Aug-2016	Sweden	Domestic	Industrials
AQ Group AB (publ) (OM:AQ)	7-Aug-2012	Sweden	Cross-border	Industrials
Arendals Fossekompani ASA	31-Aug-2011	Norway	Domestic	Utilities
Arendals Fossekompani ASA	15-May-2009	Norway	Domestic	Utilities
Arendals Fossekompani ASA	14-May-2007	Norway	Domestic	Utilities
Arendals Fossekompani ASA (OB:AFK)	18-Aug-2010	Norway	Domestic	Utilities
Aspo Oyj (HLSE:ASPO)	28-Feb-2008	Finland	Domestic	Industrials
ASSA ABLOY AB (publ) (OM:ASSA B)	4-Jun-2015	Sweden	Cross-border	Industrials
ASSA ABLOY AB (publ) (OM:ASSA B)	13-Dec-2010	Sweden	Domestic	Industrials
Atea ASA (OB:ATEA)	4-Dec-2014	Norway	Cross-border	Information Technology
Atea ASA (OB:ATEA)	1-Sep-2011	Norway	Domestic	Information Technology
Atea ASA (OB:ATEA)	29-Nov-2010	Norway	Domestic	Information Technology
Atea ASA (OB:ATEA)	17-Nov-2010	Norway	Cross-border	Information Technology
Atea ASA (OB:ATEA)	16-Jun-2010	Norway	Cross-border	Information Technology
Atea ASA (OB:ATEA)	26-Apr-2010	Norway	Cross-border	Information Technology
Atea ASA (OB:ATEA)	17-Feb-2010	Norway	Cross-border	Information Technology
Atea ASA (OB:ATEA)	19-Jun-2006	Norway	Cross-border	Information Technology
Atea ASA (OB:ATEA)	2-Jan-2001	Norway	Domestic	Information Technology
Atea ASA (OB:ATEA)	4-Jun-1999	Norway	Cross-border	Information Technology
Atea ASA (OB:ATEA)	18-May-1998	Norway	Cross-border	Information Technology
Atlas Copco AB (OM:ATCO A)	5-Feb-2007	Sweden	Domestic	Industrials
Atria Danmark A/S	6-May-2015	Finland	Cross-border	Consumer Staples
Atria Oyj	9-Jun-2016	Finland	Domestic	Consumer Staples
Atria Oyj	11-Jul-2013	Finland	Domestic	Consumer Staples
Atria Oyj (HLSE:ATRAV)	19-Feb-2007	Finland	Cross-border	Consumer Staples
Atria Oyj (HLSE:ATRAV)	22-Dec-2006	Finland	Domestic	Consumer Staples
Atria Oyj (HLSE:ATRAV)	31-Dec-1997	Finland	Cross-border	Consumer Staples
Atria Scandinavia AB	11-Mar-2016	Finland	Cross-border	Consumer Staples
Atrium Ljungberg AB (publ) (OM:ATRLJ B)	13-Jun-2003	Sweden	Domestic	Real Estate
Attendo AB (publ) (OM:ATT)	31-May-2017	Sweden	Cross-border	Healthcare
Austevoll Seafood ASA	6-Feb-2013	Norway	Domestic	Consumer Staples
Austevoll Seafood ASA	14-Oct-2008	Norway	Domestic	Consumer Staples
Austevoll Seafood ASA (OB:AUSS)	4-Jul-2013	Norway	Domestic	Consumer Staples
Austevoll Seafood ASA (OB:AUSS)	22-Dec-2006	Norway	Domestic	Consumer Staples
Avanza Bank Holding AB (publ) (OM:AZA)	8-Jun-2001	Sweden	Domestic	Financials
Axactor AB (publ) (OB:AXA)	17-Mar-2016	Norway	Domestic	Financials
Axfood AB (OM:AXFO)	15-Dec-2016	Sweden	Domestic	Consumer Staples
Axfood AB (OM:AXFO)	5-Dec-2007	Sweden	Domestic	Consumer Staples
Axfood AB (publ)	11-Sep-2001	Sweden	Cross-border	Consumer Staples
B3IT Management AB (OM:B3IT)	30-Jan-2017	Sweden	Domestic	Information Technology
Bahnhof AB (publ) (XSAT:BAHN B)	8-Jun-2015	Sweden	Domestic	Telecommunication Services
Bank of Åland Plc (HLSE:ALBAV)	22-Dec-2008	Finland	Cross-border	Financials
BankNordik P/F (CPSE:BNORDIK CSE)	8-Feb-2010	Denmark	Domestic	Financials
BasWare Oyj (HLSE:BAS1V)	5-Sep-2008	Finland	Cross-border	Information Technology
BE Group AB (publ) (OM:BEGR)	7-Oct-2010	Sweden	Domestic	Industrials

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Beijer Alma AB (publ) (OM:BEIA B)	15-Feb-2010	Sweden	Domestic	Industrials
Beijer Electronics Group AB (publ) (OM:BELE)	20-Dec-2007	Sweden	Domestic	Information Technology
Bergman & Beving AB (nka:Bergman & Beving AB)	15-Dec-2005	Sweden	Cross-border	Industrials
Bergman & Beving AB (OM:BERG B)	21-Jan-2004	Sweden	Domestic	Industrials
Bergs Timber AB (publ) (OM:BRG B)	26-Apr-2016	Sweden	Domestic	Materials
Bilia AB	28-Nov-2016	Sweden	Domestic	Consumer Discretionary
Bilia AB	11-Apr-2005	Sweden	Cross-border	Consumer Discretionary
Bilia AB (OM:BILI A)	21-Jan-2015	Sweden	Cross-border	Consumer Discretionary
Bilia AB (OM:BILI A)	6-Feb-2012	Sweden	Cross-border	Consumer Discretionary
Bilia AB (OM:BILI A)	13-Dec-2006	Sweden	Domestic	Consumer Discretionary
Bilia AB (OM:BILI A)	3-Jan-2006	Sweden	Cross-border	Consumer Discretionary
Bilia AB (OM:BILI A)	11-Jul-2002	Sweden	Cross-border	Consumer Discretionary
Bilia Personbilar AB	15-Jan-2007	Sweden	Domestic	Consumer Discretionary
Billerud Finland Oy	1-Feb-2012	Finland	Cross-border	Materials
BillerudKorsnäs AB (publ) (OM:BILL)	20-Jun-2012	Sweden	Domestic	Materials
Biotage AB (OM:BIOT)	7-Aug-2003	Sweden	Domestic	Healthcare
Bittium Oyj (HLSE:BITTI)	23-Apr-2001	Finland	Domestic	Information Technology
Bittium Technologies Oy	10-Nov-2016	Finland	Domestic	Information Technology
Björn Borg AB (publ) (OM:BORG)	25-Mar-2010	Sweden	Domestic	Consumer Discretionary
Boliden AB (OM:BOL)	8-Sep-2003	Sweden	Cross-border	Materials
Bravida Holding AB (publ) (OM:BRAV)	3-Apr-2017	Sweden	Cross-border	Industrials
Brinova Fastigheter AB (publ) (OM:BRIN B)	7-Dec-2009	Sweden	Domestic	Real Estate
Brinova Fastigheter AB (publ) (OM:BRIN B)	5-May-2008	Sweden	Domestic	Real Estate
Brødrene A & O Johansen A/S (CPSE:AOJ P)	12-Oct-2016	Denmark	Domestic	Industrials
Brødrene A & O Johansen A/S (CPSE:AOJ P)	23-Jun-2015	Denmark	Domestic	Industrials
Byggma ASA (OB:BMA)	24-Jan-2006	Norway	Domestic	Industrials
Byggmax Group AB (publ) (OM:BMAX)	4-Nov-2015	Sweden	Domestic	Consumer Discretionary
Byggmax Group AB (publ) (OM:BMAX)	16-Oct-2015	Sweden	Domestic	Consumer Discretionary
Cargotec Corporation (HLSE:CGCBV)	12-Jun-2006	Finland	Cross-border	Industrials
Cargotec Corporation (HLSE:CGCBV)	2-Dec-2004	Finland	Cross-border	Industrials
Catella AB (publ) (OM:CAT B)	5-Feb-2001	Sweden	Cross-border	Financials
Catena AB (publ) (OM:CATE)	20-Oct-2015	Sweden	Domestic	Real Estate
Citycon Oyj (HLSE:CTY1S)	25-May-2015	Finland	Cross-border	Real Estate
Citycon Oyj (HLSE:CTY1S)	31-May-2011	Finland	Cross-border	Real Estate
Clavister Holding AB (publ.) (OM:CLAV)	26-Aug-2016	Sweden	Domestic	Information Technology
Cloetta AB (publ) (OM:CLA B)	9-Dec-2013	Sweden	Domestic	Consumer Staples
Columbus A/S	30-Nov-2017	Denmark	Cross-border	Information Technology
Columbus A/S (CPSE:COLUM)	4-May-2015	Denmark	Domestic	Information Technology
Com Hem Holding AB (publ) (OM:COMH)	8-Jun-2016	Sweden	Domestic	Telecommunication Services
Componenta Corporation (HLSE:CTH1V)	31-Jul-2001	Finland	Domestic	Industrials
Consilium AB (publ) (OM:CONS B)	4-Jul-2014	Sweden	Cross-border	Information Technology
Coor Service Management Holding AB (publ)	9-Jan-2018	Sweden	Cross-border	Industrials
Coor Service Management Holding AB (publ)	10-Jan-2018	Sweden	Cross-border	Industrials
Cyber Com Consulting Group Scandinavia AB	4-Dec-2003	Sweden	Domestic	Information Technology
Cybercom Group AB; Devoteam SA (ENXTPA:DVT)	2-Apr-2007	Sweden	Domestic	Information Technology
Cybercom Group Europe AB (nka:Cybercom Group AB)	18-Dec-2007	Sweden	Cross-border	Information Technology
D. Carnegie & Co AB (publ) (OM:DCAR B)	2-Jun-2014	Sweden	Domestic	Real Estate
D. Carnegie & Co AB (publ) (OM:DCAR B)	12-Jan-2007	Sweden	Domestic	Real Estate
Dalhoff Larsen & Horneman A/S	1-Dec-2004	Denmark	Domestic	Industrials
Dalhoff Larsen & Horneman A/S (CPSE:DLH)	13-Dec-2007	Denmark	Cross-border	Industrials
Danske Bank A/S (CPSE:DANSKE)	13-Mar-2008	Denmark	Domestic	Financials

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Danske Bank A/S (CPSE:DANSKE)	9-Nov-2006	Denmark	Cross-border	Financials
Danske Bank A/S (CPSE:DANSKE)	12-Nov-1998	Denmark	Cross-border	Financials
Data Respons ASA	27-Sep-2006	Norway	Cross-border	Information Technology
Data Respons ASA (OB:DAT)	28-Nov-2001	Norway	Cross-border	Information Technology
DFDS A/S (CPSE:DFDS)	19-Dec-2001	Denmark	Cross-border	Industrials
DFDS A/S (CPSE:DFDS)	19-May-1999	Denmark	Domestic	Industrials
DFDS A/S (CPSE:DFDS); C.Ports Agencies NV	21-Oct-2010	Denmark	Cross-border	Industrials
Digia Oyj (HLSE:DIGIA)	31-May-2006	Finland	Domestic	Information Technology
Digia Oyj (HLSE:DIGIA)	21-Mar-2005	Finland	Domestic	Information Technology
Digitalist Group Plc	6-Jul-2017	Finland	Cross-border	Information Technology
Digitalist Group Plc (HLSE:DIGIGR)	4-Sep-2007	Finland	Domestic	Information Technology
DistIT AB (publ) (OM:DIST)	20-Dec-2016	Sweden	Domestic	Information Technology
DistIT AB (publ) (OM:DIST)	10-Aug-2012	Sweden	Domestic	Information Technology
Diös Fastigheter AB (publ) (OM:DIOS)	22-Sep-2011	Sweden	Domestic	Real Estate
DNB ASA	20-Dec-2002	Norway	Domestic	Financials
DNB ASA	8-Jan-2002	Norway	Cross-border	Financials
DNB ASA (OB:DNB)	1-Sep-2011	Norway	Cross-border	Financials
DNB ASA (OB:DNB)	20-Aug-2007	Norway	Cross-border	Financials
DNB ASA (OB:DNB)	18-Apr-2007	Norway	Cross-border	Financials
DNB ASA (OB:DNB)	18-Mar-2003	Norway	Domestic	Financials
DNB ASA (OB:DNB)	30-Nov-2001	Norway	Domestic	Financials
DNB ASA (OB:DNB)	1-Dec-1999	Norway	Domestic	Financials
DnB NOR Finans AS	23-Oct-2007	Norway	Domestic	Financials
DNO ASA (OB:DNO)	25-Jan-2000	Norway	Domestic	Energy
Doro AB (publ) (OM:DORO)	16-Dec-2014	Sweden	Domestic	Information Technology
DSV A/S (CPSE:DSV)	2-Jul-2001	Denmark	Domestic	Industrials
DSV A/S (CPSE:DSV)	27-Mar-2001	Denmark	Domestic	Industrials
DSV Miljø A/S	15-Oct-2001	Denmark	Domestic	Industrials
Duroc AB (publ) (OM:DURC B)	12-Feb-2007	Sweden	Domestic	Industrials
EasyFill AB (publ) (XSAT:EASY B)	14-Mar-2017	Sweden	Cross-border	Industrials
EDB Business Partner ASA (nka:EVRY ASA)	3-Sep-2007	Norway	Cross-border	Information Technology
EDB Business Partner ASA (nka:EVRY ASA)	19-Dec-2005	Norway	Domestic	Information Technology
EDB Business Partner Sweden AB (nka:EVRY AB)	10-Jan-2006	Norway	Cross-border	Information Technology
EDB Business Partner Sweden AB (nka:EVRY AB)	12-May-2005	Norway	Cross-border	Information Technology
EDB Fellesdata	23-Aug-2001	Norway	Cross-border	Information Technology
EDB Fellesdata	2-Aug-2001	Norway	Domestic	Information Technology
egetæpper a/s	8-Apr-2010	Denmark	Domestic	Consumer Discretionary
egetæpper a/s (CPSE:EGE B)	13-May-2014	Denmark	Domestic	Consumer Discretionary
Ekornes ASA (OB:EKO)	16-Dec-2013	Norway	Domestic	Consumer Discretionary
Electromagnetic Geoservices ASA (OB:EMGS)	31-Aug-2011	Norway	Domestic	Energy
Elisa Oyj	9-Jun-2006	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	20-Mar-2017	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	30-May-2016	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	10-Jun-2013	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	7-Feb-2013	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	20-Dec-2012	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	5-Nov-2010	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	25-May-2010	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	13-Feb-2009	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	7-Jul-2005	Finland	Domestic	Telecommunication Services
Elisa Oyj (HLSE:ELISA)	20-Apr-2001	Finland	Domestic	Telecommunication Services

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Elisa Oyj (HLSE:ELISA)	21-Mar-2001	Finland	Domestic	Telecommunication Services
Elos Medtech AB (publ) (OM:ELOS B)	21-Nov-2005	Sweden	Cross-border	Healthcare
Eniro AB (publ)	20-Nov-2001	Sweden	Domestic	Consumer Discretionary
Eniro AB (publ) (OM:ENRO)	23-Jan-2007	Sweden	Domestic	Consumer Discretionary
Eniro AB (publ) (OM:ENRO)	6-Feb-2006	Sweden	Cross-border	Consumer Discretionary
Eniro AB (publ) (OM:ENRO)	26-Sep-2005	Sweden	Cross-border	Consumer Discretionary
Eniro AB (publ) (OM:ENRO)	30-Mar-2004	Sweden	Domestic	Consumer Discretionary
Eniro AB (publ) (OM:ENRO)	27-Mar-2003	Sweden	Domestic	Consumer Discretionary
Eniro AB (publ) (OM:ENRO)	2-Sep-2002	Sweden	Cross-border	Consumer Discretionary
Eniro Danmark A/S	1-Jun-2007	Denmark	Domestic	Consumer Discretionary
Etteplan Oyj	4-Jul-2007	Finland	Cross-border	Industrials
Etteplan Oyj (HLSE:ETTE)	31-Aug-2015	Finland	Domestic	Industrials
Etteplan Oyj (HLSE:ETTE)	31-May-2006	Finland	Cross-border	Industrials
Evercom Network ASA	1-Jun-1999	Norway	Cross-border	Information Technology
EVRY AS (OB:EVRY)	7-Jun-2010	Norway	Domestic	Information Technology
EVRY AS (OB:EVRY)	9-Jan-2008	Norway	Domestic	Information Technology
EVRY AS (OB:EVRY)	23-Feb-2007	Norway	Cross-border	Information Technology
EVRY AS (OB:EVRY)	13-Mar-2006	Norway	Cross-border	Information Technology
EVRY AS (OB:EVRY)	16-Jan-2006	Norway	Domestic	Information Technology
EVRY AS (OB:EVRY)	16-Jan-2006	Norway	Cross-border	Information Technology
EVRY AS (OB:EVRY)	24-Nov-2004	Norway	Cross-border	Information Technology
EVRY AS (OB:EVRY)	3-Jul-2001	Norway	Cross-border	Information Technology
Fabege AB (publ) (OM:FABG)	25-Nov-2016	Sweden	Domestic	Real Estate
Fabege AB (publ) (OM:FABG)	23-Dec-2005	Sweden	Domestic	Real Estate
Fabege AB,	9-Feb-2000	Sweden	Domestic	Real Estate
Fagerhults Belysning AB	11-Jun-2013	Sweden	Cross-border	Industrials
Fastighets AB Balder (publ)	15-Dec-2015	Sweden	Cross-border	Real Estate
Fastighets AB Balder (publ)	1-Jul-2011	Sweden	Domestic	Real Estate
Fastighets AB Balder (publ)	26-Jun-2009	Sweden	Domestic	Real Estate
Fastighets AB Balder (publ) (OM:BALD B)	30-Jun-2017	Sweden	Domestic	Real Estate
Fastighets AB Balder (publ) (OM:BALD B)	20-Sep-2013	Sweden	Domestic	Real Estate
Fastighets AB Balder (publ) (OM:BALD B)	10-Oct-2005	Sweden	Domestic	Real Estate
Feelgood Svenska AB (publ) (OM:FEEL)	19-Jun-2008	Sweden	Domestic	Healthcare
Fiskars Oyj Abp (HLSE:FSKRS)	12-Dec-2012	Finland	Cross-border	Consumer Discretionary
Fiskars Oyj Abp (HLSE:FSKRS)	15-Apr-2009	Finland	Domestic	Consumer Discretionary
Fiskars Oyj Abp (HLSE:FSKRS)	29-Jun-2007	Finland	Domestic	Consumer Discretionary
FLSmidth & Co. A/S (CPSE:FLS)	13-Mar-2006	Denmark	Domestic	Industrials
Formpipe Software AB (OM:FPIP)	7-May-2012	Sweden	Cross-border	Information Technology
Fortum Oyj	15-May-2017	Finland	Cross-border	Utilities
Fortum Oyj	21-Dec-2016	Finland	Cross-border	Utilities
Fortum Oyj	10-Apr-2002	Finland	Domestic	Utilities
Fortum Oyj (HLSE:FORTUM)	13-May-2016	Finland	Domestic	Utilities
Fortum Oyj (HLSE:FORTUM)	17-Jan-2005	Finland	Domestic	Utilities
Fortum Oyj (HLSE:FORTUM)	6-Nov-2001	Finland	Cross-border	Utilities
F-Secure Oyj (HLSE:FSC1V)	2-Jun-2015	Finland	Cross-border	Information Technology
F-Secure Oyj (HLSE:FSC1V)	2-Apr-2000	Finland	Domestic	Information Technology
Fynske Bank A/S (CPSE:FYNBK)	4-Sep-2013	Denmark	Domestic	Financials
Getinge AB (OM:GETI B)	31-Jul-1995	Sweden	Domestic	Healthcare
Goodtech ASA (OB:GOD)	22-Feb-2008	Norway	Cross-border	Industrials
Guideline Geo AB (publ) (NGM:GGEO)	1-Nov-2007	Sweden	Domestic	Energy
H & M Hennes & Mauritz AB (publ) (OM:HM B)	6-Mar-2008	Sweden	Domestic	Consumer Discretionary

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Hakon Invest AB (nka:ICA Gruppen AB (publ))	28-Apr-2009	Sweden	Domestic	Consumer Staples
Hanza AB	18-Jan-2018	Sweden	Domestic	Information Technology
Hanza Holding AB (publ) (OM:HANZA)	1-Jul-2015	Sweden	Cross-border	Information Technology
Hemfosa Fastigheter AB (publ) (OM:HEMF)	12-Jun-2017	Sweden	Domestic	Real Estate
Hexagon Composites ASA (OB:HEX)	7-Sep-2001	Norway	Domestic	Industrials
Hexatronic Group AB (publ) (OM:HTRO)	27-Feb-2015	Sweden	Domestic	Industrials
Hexatronic Group AB (publ) (OM:HTRO)	14-Aug-2014	Sweden	Domestic	Industrials
Hexatronic Scandinavia AB (publ)	15-Oct-2013	Sweden	Domestic	Industrials
Hexpol AB (Publ) (OM:HPOL B)	16-Mar-2010	Sweden	Domestic	Materials
HiQ International AB (publ) (OM:HIQ)	26-Jun-2008	Sweden	Cross-border	Information Technology
HiQ International AB (publ) (OM:HIQ)	10-Apr-2002	Sweden	Cross-border	Information Technology
HKScan Oyj (HLSE:HKSAV)	9-Sep-2010	Finland	Cross-border	Consumer Staples
Holmen Aktiebolag (publ) (OM:HOLM B)	21-Mar-2017	Sweden	Domestic	Materials
Hunter Group ASA	15-Feb-2018	Norway	Domestic	Energy
Hunter Group ASA (OB:HUNT)	20-Mar-2017	Norway	Domestic	Energy
Husqvarna AB (publ) (OM:HUSQ B)	8-Jan-2007	Sweden	Domestic	Consumer Discretionary
IAR Systems Group AB (publ) (OM:IAR B)	22-Dec-2004	Sweden	Domestic	Information Technology
ICA Gruppen AB (OM:ICA)	19-Jun-2007	Sweden	Domestic	Consumer Staples
ICA Gruppen AB (OM:ICA)	24-May-2006	Sweden	Domestic	Consumer Staples
ICTA AB (publ) (OM:ICTA)	21-Oct-2013	Sweden	Cross-border	Industrials
ICTA AB (publ) (OM:ICTA)	26-Sep-2008	Sweden	Domestic	Industrials
Image Systems AB (OM:IS)	12-Jan-2012	Sweden	Domestic	Information Technology
Indutrade AB (publ)	1-Jul-2016	Sweden	Domestic	Industrials
Indutrade AB (publ)	3-May-2016	Sweden	Cross-border	Industrials
Indutrade AB (publ)	12-Mar-2015	Sweden	Cross-border	Industrials
Indutrade AB (publ) (OM:INDT)	13-Dec-2012	Sweden	Cross-border	Industrials
Inmeta ASA	27-May-2010	Norway	Domestic	Information Technology
Inmeta ASA	3-Jun-2008	Norway	Domestic	Information Technology
Innofactor Plc (HLSE:IFA1V)	10-Oct-2016	Finland	Cross-border	Information Technology
Innofactor Plc (HLSE:IFA1V)	22-Dec-2015	Finland	Cross-border	Information Technology
Innofactor Plc (HLSE:IFA1V)	7-Jun-2013	Finland	Domestic	Information Technology
Instalco Intressenter AB (OM:INSTAL)	13-Nov-2017	Sweden	Domestic	Industrials
Intrum Justitia AB (OM:INTRUM)	2-Oct-2014	Sweden	Cross-border	Industrials
Intrum Justitia AB (OM:INTRUM)	30-Sep-2011	Sweden	Cross-border	Industrials
Intrum Justitia AB (OM:INTRUM)	21-Dec-2010	Sweden	Domestic	Industrials
Intrum Justitia AB (OM:INTRUM)	3-Nov-2010	Sweden	Cross-border	Industrials
Inwido AB (OM:INWI)	9-May-2017	Sweden	Cross-border	Industrials
Itab Shop Concept AB (OM:ITAB B)	18-May-2016	Sweden	Cross-border	Industrials
Itab Shop Concept AB (OM:ITAB B)	2-May-2016	Sweden	Domestic	Industrials
Jutlander Bank A/S (CPSE:JUTBK)	22-Dec-2014	Denmark	Domestic	Financials
Karo Pharma AB (publ) (OM:KARO)	1-Nov-2016	Sweden	Domestic	Healthcare
Karo Pharma AB (publ) (OM:KARO)	22-Dec-2015	Sweden	Domestic	Healthcare
Karo Pharma AB (publ) (OM:KARO)	1-Sep-2015	Sweden	Domestic	Healthcare
Kemira Oyj	7-Feb-2005	Finland	Domestic	Materials
Kemira Oyj	7-Nov-2000	Finland	Cross-border	Materials
Kemira Oyj (HLSE:KEMIRA)	7-Jun-2000	Finland	Domestic	Materials
Keskisuomalainen Oyj (HLSE:KSLAV)	30-Sep-2016	Finland	Domestic	Consumer Discretionary
Kesko Food Ltd	18-Nov-2015	Finland	Domestic	Consumer Staples
Kesko Oyj (HLSE:KESKOB)	12-Jan-2016	Finland	Domestic	Consumer Staples
Knowit Aktiebolag (publ) (OM:KNOW)	7-Dec-2009	Sweden	Cross-border	Information Technology
Knowit Aktiebolag (publ) (OM:KNOW)	26-Sep-2007	Sweden	Cross-border	Information Technology

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Konecranes Plc (HLSE:KCR)	8-Sep-2004	Finland	Cross-border	Industrials
Lagercrantz Group AB (publ)	22-Jun-2010	Sweden	Domestic	Information Technology
Lagercrantz Group AB (publ) (OM:LAGR B)	30-May-2006	Sweden	Domestic	Information Technology
Lammhults Design Group AB (publ) (OM:LAMM B)	26-May-2016	Sweden	Domestic	Industrials
Lammhults Design Group AB (publ) (OM:LAMM B)	18-Sep-2013	Sweden	Cross-border	Industrials
Lammhults Design Group AB (publ) (OM:LAMM B)	11-Jun-2002	Sweden	Cross-border	Industrials
Lassila & Tikanoja Oyj (HLSE:LAT1V)	20-Jun-2017	Finland	Cross-border	Industrials
Lassila & Tikanoja Oyj (HLSE:LAT1V)	18-Dec-2006	Finland	Domestic	Industrials
Lassila & Tikanoja Oyj (HLSE:LAT1V)	31-Jan-2000	Finland	Domestic	Industrials
Lemminkäinen Oyj	19-Feb-2001	Finland	Cross-border	Industrials
Lerøy Seafood Group Asa	21-Aug-2006	Norway	Domestic	Consumer Staples
Lerøy Seafood Group Asa	24-Apr-2006	Norway	Domestic	Consumer Staples
Lerøy Seafood Group Asa (OB:LSG)	2-Jun-2016	Norway	Domestic	Consumer Staples
Lerøy Seafood Group Asa (OB:LSG)	2-Jun-2016	Norway	Domestic	Consumer Staples
Lerøy Seafood Group Asa (OB:LSG)	28-Sep-2010	Norway	Domestic	Consumer Staples
Lerøy Seafood Group Asa (OB:LSG)	26-Feb-2007	Norway	Domestic	Consumer Staples
Lerøy Seafood Group Asa (OB:LSG)	21-Jun-2005	Norway	Domestic	Consumer Staples
Lerøy Seafood Group Asa (OB:LSG)	27-Oct-2003	Norway	Domestic	Consumer Staples
Link Mobility Group ASA	24-May-2017	Norway	Domestic	Information Technology
Link Mobility Group ASA (OB:LINK)	7-Sep-2016	Norway	Cross-border	Information Technology
Link Mobility Group ASA (OB:LINK)	24-Jun-2016	Norway	Domestic	Information Technology
Link Mobility Group ASA (OB:LINK)	17-Mar-2016	Norway	Cross-border	Information Technology
Link Mobility Group ASA (OB:LINK)	1-Jun-2015	Norway	Cross-border	Information Technology
Link Mobility Group ASA (OB:LINK)	24-Oct-2014	Norway	Domestic	Information Technology
Lännen Tehtaat Oyj (nka:Apetit Oyj)	13-May-2004	Finland	Domestic	Consumer Staples
Magnolia Bostad AB (publ) (OM:MAG)	15-Jun-2017	Sweden	Domestic	Real Estate
Marine Harvest ASA	17-Dec-2012	Norway	Domestic	Consumer Staples
Marine Harvest ASA (OB:MHG)	10-Oct-2005	Norway	Domestic	Consumer Staples
MedicaNatumin AB (publ) (NGM:MEDNA MTF)	25-Jul-2007	Sweden	Cross-border	Consumer Staples
Medivir AB (publ) (OM:MVIR B)	11-Apr-2011	Sweden	Domestic	Healthcare
Mekonomen AB (OM:MEKO)	12-Oct-2011	Sweden	Domestic	Consumer Discretionary
Mekonomen AB (OM:MEKO)	27-Jan-2011	Sweden	Cross-border	Consumer Discretionary
Metso Corporation (HLSE:METSO)	5-Nov-2009	Finland	Domestic	Industrials
Metso Corporation (HLSE:METSO)	2-Oct-2009	Finland	Cross-border	Industrials
Metso Corporation (HLSE:METSO)	8-Feb-2006	Finland	Cross-border	Industrials
Metso Corporation (HLSE:METSO)	21-Jun-2000	Finland	Cross-border	Industrials
Metsä Board Oyj (HLSE:METSB)	7-May-2007	Finland	Domestic	Materials
Metsä Board Oyj (HLSE:METSB)	2-Aug-2004	Finland	Domestic	Materials
Midsona AB (publ)	29-Mar-2007	Sweden	Domestic	Consumer Staples
Midsona AB (publ) (OM:MSON B)	15-May-2017	Sweden	Domestic	Consumer Staples
Midsona AB (publ) (OM:MSON B)	5-Jul-2016	Sweden	Domestic	Consumer Staples
Midsona AB (publ) (OM:MSON B)	4-Jun-2015	Sweden	Cross-border	Consumer Staples
Midsona AB (publ) (OM:MSON B)	17-Feb-2012	Sweden	Cross-border	Consumer Staples
Midsona AB (publ) (OM:MSON B)	15-Nov-2006	Sweden	Cross-border	Consumer Staples
Midsona AB (publ) (OM:MSON B)	22-Nov-2004	Sweden	Domestic	Consumer Staples
Modern Times Group Mtg AB (OM:MTG B)	12-Nov-2015	Sweden	Domestic	Consumer Discretionary
Modern Times Group Mtg AB (OM:MTG B)	30-Jul-2012	Sweden	Domestic	Consumer Discretionary
Modern Times Group Mtg AB (OM:MTG B)	9-Jan-2007	Sweden	Domestic	Consumer Discretionary
Morphic Technologies AB (publ)	9-Jun-2008	Sweden	Cross-border	Industrials
MTG Studios AB	23-Sep-2013	Sweden	Cross-border	Consumer Discretionary
Multiconsult ASA (OB:MULTI)	7-Mar-2017	Norway	Cross-border	Industrials

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Multiconsult ASA (OB:MULTI)	11-Aug-2015	Norway	Domestic	Industrials
Navamedic ASA (OB:NAVA)	4-Aug-2015	Norway	Cross-border	Healthcare
NCC AB (OM:NCC B)	1-Sep-2000	Sweden	Cross-border	Industrials
Nederman Holding AB (publ) (OM:NMAN)	25-Oct-2017	Sweden	Cross-border	Industrials
Nel ASA (OB:NEL)	8-Sep-2014	Norway	Domestic	Industrials
Neo Industrial Plc (HLSE:NEO1V)	11-May-2007	Finland	Domestic	Industrials
Net Gaming Europe AB (publ) (XSAT:NETG)	10-Nov-2017	Sweden	Domestic	Consumer Discretionary
New Wave Group AB (publ) (OM:NEWA B)	21-Aug-2001	Sweden	Domestic	Consumer Discretionary
Newcap Holding A/S (CPSE:NEWCAP)	1-Jul-2016	Denmark	Cross-border	Financials
Newcap Holding A/S (CPSE:NEWCAP)	12-Nov-2007	Denmark	Cross-border	Financials
Newcap Holding A/S (CPSE:NEWCAP)	25-Jun-2007	Denmark	Domestic	Financials
Newcap Holding A/S (CPSE:NEWCAP)	7-May-2007	Denmark	Cross-border	Financials
Newcap Holding A/S (CPSE:NEWCAP)	23-Apr-2007	Denmark	Domestic	Financials
Newcap Holding A/S (CPSE:NEWCAP)	22-Mar-2007	Denmark	Domestic	Financials
Newcap Holding A/S (CPSE:NEWCAP)	19-Oct-2006	Denmark	Cross-border	Financials
Newcap Holding A/S (CPSE:NEWCAP)	29-Dec-2005	Denmark	Domestic	Financials
Nexam Chemical Holding AB (publ) (OM:NEXAM)	8-Dec-2017	Sweden	Domestic	Materials
NextGenTel Holding ASA (OB:NGT)	17-Sep-2015	Norway	Domestic	Telecommunication Services
NextGenTel Holding ASA (OB:NGT)	20-Dec-2012	Norway	Domestic	Telecommunication Services
NGS Group AB (publ) (OM:NGS)	29-Jan-2016	Sweden	Domestic	Healthcare
Nilfisk A/S (CPSE:NLFSK)	5-Nov-2010	Denmark	Domestic	Industrials
Nilfisk A/S (CPSE:NLFSK)	4-May-2004	Denmark	Domestic	Industrials
Nilfisk A/S (CPSE:NLFSK)	29-Jul-1998	Denmark	Cross-border	Industrials
Nokia Corporation (HLSE:NOKIA)	28-Sep-2009	Finland	Domestic	Information Technology
Nokia Corporation (HLSE:NOKIA)	28-Jan-2008	Finland	Cross-border	Information Technology
Nokia Solutions and Networks Oy	9-Feb-2017	Finland	Domestic	Information Technology
Nokian Renkaat Oyj (HLSE:NRE1V)	26-Oct-1999	Finland	Domestic	Consumer Discretionary
Nolato AB (publ) (OM:NOLA B)	5-Mar-2007	Sweden	Domestic	Industrials
Nolato AB (publ) (OM:NOLA B)	23-Oct-2006	Sweden	Domestic	Industrials
Norda ASA (OTCNO:NORD)	1-Mar-2007	Norway	Domestic	Healthcare
Nordea Bank AB (publ) (OM:NDA SEK)	2-Mar-2010	Sweden	Cross-border	Financials
Nordea Bank AB (publ) (OM:NDA SEK)	31-Aug-2009	Sweden	Cross-border	Financials
Nordea Bank AB (publ) (OM:NDA SEK)	20-Sep-1999	Sweden	Cross-border	Financials
Nordic Leisure AB (Publ) (OM:NLAB)	12-Jun-2017	Sweden	Domestic	Consumer Discretionary
Nordic Railway Construction AB	31-Mar-2017	Norway	Cross-border	Industrials
Nordic Shipholding A/S (CPSE:NORDIC)	26-Nov-2009	Denmark	Domestic	Industrials
Nordjyske Bank A/S (CPSE:NORDJB)	10-Oct-2014	Denmark	Domestic	Financials
Norsk Hydro ASA (OB:NHY); Statoil ASA (OB:STL)	10-May-1999	Norway	Domestic	Materials
Novo Group Oyj (nka:WM-data Novo Oy)	17-Jun-2002	Finland	Domestic	Information Technology
Novo Group Oyj (nka:WM-data Novo Oy)	21-Jan-2002	Finland	Domestic	Information Technology
NRC Norge AS	10-Oct-2017	Norway	Domestic	Industrials
NRC Norge AS	29-Jun-2017	Norway	Domestic	Industrials
NRC Norge AS	28-Mar-2017	Norway	Domestic	Industrials
NTS ASA (OB:NTS)	26-Jan-2018	Norway	Domestic	Industrials
Olvi Oyj (HLSE:OLVAS)	1-Feb-2018	Finland	Domestic	Consumer Staples
Orexo AB (publ) (OM:ORX)	15-Oct-2007	Sweden	Domestic	Healthcare
Orion Corp., prior to its demerger	12-Apr-2002	Finland	Cross-border	Healthcare
Orkla ASA (OB:ORK)	21-Nov-2017	Norway	Cross-border	Consumer Staples
Orkla ASA (OB:ORK)	15-Jan-2015	Norway	Cross-border	Consumer Staples
Orkla ASA (OB:ORK)	22-Jun-2012	Norway	Domestic	Consumer Staples
Orkla ASA (OB:ORK)	8-Nov-2004	Norway	Cross-border	Consumer Staples

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Oslo Børs VPS Holding ASA (OTCNO:OSLO)	19-Mar-2007	Norway	Domestic	Financials
Outokumpu Oyj (HLSE:OUT1V)	25-Jun-2008	Finland	Cross-border	Materials
Outokumpu Oyj (HLSE:OUT1V)	8-Sep-2003	Finland	Cross-border	Materials
Outotec Oyj (HLSE:OTE1V)	15-Oct-2009	Finland	Domestic	Industrials
P/F Atlantic Petroleum (CPSE:ATLA DKK)	13-Nov-2012	Denmark	Cross-border	Energy
P/F Bakkafrost (OB:BAKKA)	29-Jun-2016	Denmark	Domestic	Consumer Staples
P/F Bakkafrost (OB:BAKKA)	11-Apr-2011	Denmark	Domestic	Consumer Staples
Pan Fish ASA (nka:Marine Harvest ASA)	2-Jan-2006	Norway	Domestic	Consumer Staples
Pan Fish ASA (nka:Marine Harvest ASA)	15-Nov-2001	Norway	Domestic	Consumer Staples
Pandora A/S (CPSE:PNDORA)	3-Mar-2014	Denmark	Domestic	Consumer Discretionary
Pandox AB (publ) (OM:PNDX B)	7-Feb-2000	Sweden	Domestic	Consumer Discretionary
PARKEN Sport & Entertainment A/S (CPSE:PARKEN)	10-Apr-2006	Denmark	Domestic	Consumer Discretionary
PARKEN Sport & Entertainment A/S (CPSE:PARKEN)	26-Jan-2004	Denmark	Domestic	Consumer Discretionary
Peab AB (OM:PEAB B)	2-May-2012	Sweden	Domestic	Industrials
Peab AB (OM:PEAB B)	19-Apr-2011	Sweden	Domestic	Industrials
Peab AB (OM:PEAB B)	17-Apr-2009	Sweden	Domestic	Industrials
Peab AB (OM:PEAB B)	15-Oct-2008	Sweden	Domestic	Industrials
Peab AB (OM:PEAB B)	5-Apr-2005	Sweden	Domestic	Industrials
Peab AB (OM:PEAB B)	28-Jan-2004	Sweden	Domestic	Industrials
Per Aarsleff Holding A/S (CPSE:PAAL B)	31-Aug-2017	Denmark	Cross-border	Industrials
Per Aarsleff Holding A/S (CPSE:PAAL B)	9-Apr-2008	Denmark	Domestic	Industrials
Petroleum Geo-Services ASA (OB:PGS)	16-Aug-2007	Norway	Domestic	Energy
Pharmexa A/S	12-Apr-2005	Denmark	Cross-border	Healthcare
Pihlajalinna Oyj	30-Jan-2018	Finland	Domestic	Healthcare
Pihlajalinna Oyj (HLSE:PIHLIS)	9-Dec-2015	Finland	Domestic	Healthcare
Proact IT Group AB (publ) (OM:PACT)	30-Dec-2015	Sweden	Domestic	Information Technology
Proact IT Group AB (publ) (OM:PACT)	24-Nov-2003	Sweden	Domestic	Information Technology
Proact IT Group AB (publ) (OM:PACT)	5-Jul-2002	Sweden	Cross-border	Information Technology
Qliro Group AB (publ) (OM:QLRO)	28-Apr-2011	Sweden	Domestic	Consumer Discretionary
Ragasco AS (nka:Hexagon Ragasco AS)	30-Mar-2010	Norway	Cross-border	Industrials
Raisio plc (HLSE:RAIVV)	13-Feb-2003	Finland	Domestic	Consumer Staples
Ramirent AS	27-Jun-2011	Finland	Cross-border	Industrials
Ramirent Oyj (HLSE:RMR1V)	10-Dec-2003	Finland	Cross-border	Industrials
Ramirent Oyj (HLSE:RMR1V)	29-Aug-2002	Finland	Cross-border	Industrials
Rejlers AB (OM:REJL B)	3-Sep-2010	Sweden	Domestic	Industrials
Rejlers AS	15-Mar-2012	Norway	Domestic	Information Technology
Restamax Oyj (HLSE:RESTA)	8-Jul-2014	Finland	Domestic	Consumer Discretionary
Restamax Oyj (HLSE:RESTA)	5-Mar-2014	Finland	Domestic	Consumer Discretionary
Revenio Group Oyj (HLSE:REG1V)	22-Aug-2007	Finland	Domestic	Healthcare
Ringkjøbing Landbobank A/S (CPSE:RILBA)	27-Jun-2002	Denmark	Domestic	Financials
RNB Retail and Brands AB (publ) (OM:RNBS)	9-May-2006	Sweden	Domestic	Consumer Discretionary
RNB Retail and Brands AB (publ) (OM:RNBS)	9-Feb-2005	Sweden	Domestic	Consumer Discretionary
Royal Unibrew A/S (CPSE:RBREW)	11-Jul-2013	Denmark	Cross-border	Consumer Staples
Saga Tankers Asa (OB:SAGA)	30-Jan-2015	Norway	Domestic	Energy
SalMar ASA (OB:SALM)	14-Mar-2011	Norway	Domestic	Consumer Staples
SalMar ASA (OB:SALM)	26-May-2010	Norway	Domestic	Consumer Staples
Samhällsbyggnadsbolaget i Norden AB (publ)	20-Nov-2017	Sweden	Cross-border	Real Estate
Sampo Oyj (HLSE:SAMPO)	11-Feb-2004	Finland	Cross-border	Financials
Sandnes Sparebank (OB:SADG)	21-Feb-2003	Norway	Domestic	Financials
Sandvik AB	7-Nov-2011	Sweden	Domestic	Industrials
Sandvik AB	2-Sep-2005	Sweden	Domestic	Industrials

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Sandvik AB (OM:SAND)	24-Nov-2004	Sweden	Domestic	Industrials
Sandvik AB (OM:SAND)	10-Nov-1997	Sweden	Cross-border	Industrials
Sandvik Machining Solutions AB	17-Apr-2008	Sweden	Cross-border	Industrials
Sandvik Mining and Construction USA, LLC	7-Jun-2001	Sweden	Domestic	Industrials
SBC Sveriges BostadsrättsCentrum AB (publ)	7-Jan-2015	Sweden	Domestic	Real Estate
Scandi Standard AB (publ) (OM:SCST)	19-May-2015	Sweden	Cross-border	Consumer Staples
Scandic Hotels Group AB (OM:SHOT)	21-Jun-2017	Sweden	Cross-border	Consumer Discretionary
Scandinavian Brake Systems A/S (CPSE:SBS)	20-Oct-2005	Denmark	Domestic	Consumer Discretionary
Scanfil Oyj (HLSE:SCANFL)	25-May-2015	Finland	Cross-border	Information Technology
Schibsted ASA (OB:SCHA)	12-Jan-2012	Norway	Cross-border	Consumer Discretionary
Sdiptech AB (publ) (OM:SDIP B)	1-Nov-2017	Sweden	Domestic	Industrials
Sdiptech AB (publ) (OM:SDIP B)	31-Oct-2017	Sweden	Domestic	Industrials
Securitas AB (OM:SECU B)	18-Jun-1997	Sweden	Domestic	Industrials
Self Storage Group ASA (OB:SSG)	13-Dec-2017	Norway	Domestic	Industrials
Sevan Marine ASA (OB:SEVAN)	21-Jun-2005	Norway	Domestic	Energy
Skandinaviska Enskilda Banken AB (publ.) (OM:SEB A)	25-Apr-2005	Sweden	Cross-border	Financials
Skandinaviska Enskilda Banken AB (publ.) (OM:SEB A)	3-Oct-1997	Sweden	Domestic	Financials
Skanska AB	29-Aug-2000	Sweden	Cross-border	Industrials
Skanska AB	13-Apr-2000	Sweden	Cross-border	Industrials
Skanska AB	17-Dec-1999	Sweden	Domestic	Industrials
Skanska AB (publ) (OM:SKA B)	25-Feb-1999	Sweden	Cross-border	Industrials
Skanska AB (publ) (OM:SKA B)	25-Mar-1997	Sweden	Domestic	Industrials
Skanska AB (publ) (OM:SKA B)	10-Jun-1996	Sweden	Domestic	Industrials
SKF AB (OM:SKF B)	21-Jun-2006	Sweden	Cross-border	Industrials
SkiStar AB (publ) (OM:SKIS B)	16-Jan-2007	Sweden	Domestic	Consumer Discretionary
SkiStar AB (publ) (OM:SKIS B)	19-May-2005	Sweden	Cross-border	Consumer Discretionary
Solteq Oyj (HLSE:SOLTEQ)	17-Jun-2015	Finland	Domestic	Information Technology
Solteq Oyj (HLSE:SOLTEQ)	20-Mar-2012	Finland	Domestic	Information Technology
SP Group A/S (CPSE:SPG)	21-Mar-2017	Denmark	Domestic	Materials
SP Group A/S (CPSE:SPG)	22-Jun-2015	Denmark	Domestic	Materials
Spar Nord Bank A/S (CPSE:SPNO)	18-Sep-2012	Denmark	Domestic	Financials
Sparbank A/S	18-Jul-2011	Denmark	Domestic	Financials
SpareBank 1 BV (OB:SBVG)	22-Jun-2016	Norway	Domestic	Financials
Sparebanken Møre (OB:MORG)	24-Nov-2005	Norway	Domestic	Financials
Sparebanken Vest (OB:SVEG)	23-Jun-2009	Norway	Domestic	Financials
Sparebanken Vest (OB:SVEG)	5-Dec-2006	Norway	Domestic	Financials
Statoil ASA (OB:STL)	18-Dec-2006	Norway	Domestic	Energy
Statoil ASA (OB:STL)	18-Sep-2003	Norway	Cross-border	Energy
Stockmann Oyj ABP (HLSE:STCBV)	1-Oct-2007	Finland	Cross-border	Consumer Discretionary
Stockwik Förvaltning AB (publ) (OM:STWK)	29-Oct-2007	Sweden	Domestic	Industrials
Storebrand ASA (OB:STB)	12-Feb-2008	Norway	Domestic	Financials
Storebrand ASA (OB:STB)	6-Jan-1999	Norway	Domestic	Financials
Storytel AB (XSAT:STORY B)	2-Mar-2017	Sweden	Cross-border	Consumer Discretionary
Storytel AB (XSAT:STORY B)	22-Jun-2016	Sweden	Domestic	Consumer Discretionary
Storytel AB (XSAT:STORY B)	20-May-2016	Sweden	Cross-border	Consumer Discretionary
StrongPoint ASA (OB:STRONG)	16-Apr-2008	Norway	Cross-border	Information Technology
Svedbergs i Dalstorp AB (OM:SVED B)	9-Sep-2016	Sweden	Domestic	Industrials
Svensk Järnvägsteknik AB	22-Jun-2015	Norway	Cross-border	Industrials
Svensk Järnvägsteknik AB	22-Jun-2015	Norway	Cross-border	Industrials
Svenska Cellulosa Aktiebolaget SCA (publ)	1-Nov-1999	Sweden	Cross-border	Materials
Svenska Handelsbanken AB (publ) (OM:SHB A)	15-Sep-2008	Sweden	Cross-border	Financials

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Svenska Handelsbanken AB (publ) (OM:SHB A)	21-Dec-2001	Sweden	Domestic	Financials
Svenska Handelsbanken AB (publ) (OM:SHB A)	11-Apr-2001	Sweden	Cross-border	Financials
Svenska Handelsbanken AB (publ) (OM:SHB A)	3-May-1999	Sweden	Cross-border	Financials
Sweco AB (publ) (OM:SWEC B)	17-Jun-2013	Sweden	Domestic	Industrials
Sweco AB (publ) (OM:SWEC B)	19-Dec-2011	Sweden	Cross-border	Industrials
Sweco AB (publ) (OM:SWEC B)	3-Dec-2003	Sweden	Cross-border	Industrials
Swedbank AB (publ) (OM:SWED A)	14-Feb-2014	Sweden	Domestic	Financials
Swedbank AB (publ) (OM:SWED A)	12-Feb-2007	Sweden	Domestic	Financials
Swedish Orphan Biovitrum AB (OM:SOBI)	5-Nov-2009	Sweden	Domestic	Healthcare
Sydbank A/S (CPSE:SYDB)	11-Nov-2013	Denmark	Domestic	Financials
Sydbank A/S (CPSE:SYDB)	21-Jan-2008	Denmark	Domestic	Financials
Saab AB (publ)	22-Feb-2002	Sweden	Domestic	Industrials
Saab AB (publ)	7-Sep-2001	Sweden	Domestic	Industrials
Saab AB (publ)	7-May-2001	Sweden	Domestic	Industrials
Saab AB (publ) (OM:SAAB B)	14-Apr-2014	Sweden	Domestic	Industrials
Saab AB (publ) (OM:SAAB B)	12-Jun-2006	Sweden	Domestic	Industrials
Saab AB (publ) (OM:SAAB B)	29-May-2006	Sweden	Cross-border	Industrials
Targovax ASA (OB:TRVX)	11-Jun-2015	Norway	Cross-border	Healthcare
TDC A/S	12-Mar-2009	Denmark	Domestic	Telecommunication Services
TDC A/S (CPSE:TDC)	11-Sep-2017	Denmark	Domestic	Telecommunication Services
TDC A/S (CPSE:TDC)	15-Sep-2014	Denmark	Cross-border	Telecommunication Services
TDC A/S (CPSE:TDC)	11-May-2011	Denmark	Domestic	Telecommunication Services
TDC A/S (CPSE:TDC)	17-Nov-2009	Denmark	Domestic	Telecommunication Services
TDC A/S (CPSE:TDC)	1-Dec-2004	Denmark	Domestic	Telecommunication Services
TDC A/S (CPSE:TDC)	14-Sep-2004	Denmark	Cross-border	Telecommunication Services
TDC A/S (CPSE:TDC)	19-Aug-1999	Denmark	Cross-border	Telecommunication Services
TDC Kabel TV A/S (nka:YouSee A/S)	25-Sep-2006	Denmark	Domestic	Consumer Discretionary
TDC Mobile International A/S	27-Jan-2004	Denmark	Domestic	Telecommunication Services
TDC Tele Danmark A/S (nka:Tdc Totalløsninger A/S)	19-Jun-2002	Denmark	Cross-border	Information Technology
Technopolis Plc (HLSE:TPS1V)	5-Nov-2007	Finland	Domestic	Real Estate
Technopolis Plc (HLSE:TPS1V)	15-Aug-2007	Finland	Domestic	Real Estate
Techstep ASA (OB:TECH)	3-Jul-2017	Norway	Cross-border	Information Technology
Techstep ASA (OB:TECH)	2-Feb-2017	Norway	Domestic	Information Technology
Techstep ASA, Prior to Reverse Merger with Zono AS	14-May-2007	Norway	Cross-border	Information Technology
Techstep ASA, Prior to Reverse Merger with Zono AS	30-Apr-2007	Norway	Cross-border	Information Technology
Techstep ASA, Prior to Reverse Merger with Zono AS	22-Nov-2004	Norway	Cross-border	Information Technology
Techstep ASA, Prior to Reverse Merger with Zono AS	4-Jul-2016	Norway	Domestic	Information Technology
Tele2 AB (publ) (OM:TEL2 B)	10-Jan-2018	Sweden	Domestic	Telecommunication Services
Tele2 AB (publ) (OM:TEL2 B)	28-May-2010	Sweden	Domestic	Telecommunication Services
Tele2 AB (publ) (OM:TEL2 B)	30-Jun-2006	Sweden	Domestic	Telecommunication Services
Tele2 AB (publ) (OM:TEL2 B)	12-May-2003	Sweden	Cross-border	Telecommunication Services
Telefonaktiebolaget LM Ericsson (publ) (OM:ERIC B)	26-Feb-2007	Sweden	Cross-border	Information Technology
Telefonaktiebolaget LM Ericsson (publ) (OM:ERIC B)	5-Jun-2006	Sweden	Domestic	Information Technology
Telefonaktiebolaget LM Ericsson (publ) (OM:ERIC B)	11-Jun-1999	Sweden	Cross-border	Information Technology
Telenor ASA (OB:TEL)	23-Jun-2008	Norway	Domestic	Telecommunication Services
Telenor ASA (OB:TEL)	6-Jul-2007	Norway	Domestic	Telecommunication Services
Telenor ASA (OB:TEL)	9-May-2007	Norway	Cross-border	Telecommunication Services
Telenor ASA (OB:TEL)	23-May-2005	Norway	Cross-border	Telecommunication Services
Telenor ASA (OB:TEL)	23-May-2005	Norway	Cross-border	Telecommunication Services
Telenor ASA (OB:TEL)	23-Aug-2004	Norway	Domestic	Telecommunication Services
Telenor ASA (OB:TEL)	18-Nov-2002	Norway	Cross-border	Telecommunication Services

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Telenor ASA (OB:TEL)	1-Jun-2001	Norway	Cross-border	Telecommunication Services
Teleste Corporation (HLSE:TLT1V)	7-Jan-2015	Finland	Domestic	Information Technology
Teleste Corporation (HLSE:TLT1V)	19-Jun-2006	Finland	Cross-border	Information Technology
Telia Company AB (OM:TELIA)	18-Dec-2017	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	7-Nov-2016	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	1-Oct-2014	Sweden	Domestic	Telecommunication Services
Telia Company AB (OM:TELIA)	18-Dec-2013	Sweden	Domestic	Telecommunication Services
Telia Company AB (OM:TELIA)	17-Jun-2008	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	1-Feb-2007	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	16-Nov-2006	Sweden	Domestic	Telecommunication Services
Telia Company AB (OM:TELIA)	16-May-2006	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	6-Jul-2005	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	8-Jul-2004	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	26-Mar-2002	Sweden	Cross-border	Telecommunication Services
Telia Company AB (OM:TELIA)	26-Jun-2001	Sweden	Cross-border	Telecommunication Services
THQ Nordic AB (publ) (OM:THQN B)	17-Nov-2017	Sweden	Domestic	Information Technology
Tieto Oyj (HLSE:TIE1V)	25-Jun-2015	Finland	Cross-border	Information Technology
Tieto Oyj (HLSE:TIE1V)	16-Sep-2004	Finland	Domestic	Information Technology
Tieto Oyj (HLSE:TIE1V)	19-Nov-2003	Finland	Cross-border	Information Technology
Tieto Oyj (HLSE:TIE1V)	26-Sep-2002	Finland	Cross-border	Information Technology
Tieto-X Oyj (nka:Digitalist Group Plc)	7-Oct-2005	Finland	Domestic	Information Technology
Tomra Systems ASA (OB:TOM)	12-Jul-2004	Norway	Domestic	Industrials
Topdanmark A/S (CPSE:TOP)	8-Mar-2001	Denmark	Domestic	Financials
Topdanmark AS	1-Nov-1999	Denmark	Domestic	Financials
Trainers' House Oyj (HLSE:TRH1V)	14-Dec-2005	Finland	Domestic	Industrials
Transtema Group AB (XSAT:TRANS)	19-Apr-2017	Sweden	Domestic	Telecommunication Services
Trention AB (publ) (OM:TRENT)	17-Apr-2009	Sweden	Domestic	Utilities
Trention AB (publ) (OM:TRENT)	4-Jun-2007	Sweden	Domestic	Utilities
Tryg A/S (CPSE:TRYG)	4-Dec-2017	Denmark	Domestic	Financials
Tryg A/S (CPSE:TRYG)	2-Mar-2009	Denmark	Cross-border	Financials
TTS Group ASA (OB:TTS)	30-Apr-2007	Norway	Domestic	Industrials
Tulikivi Corporation (HLSE:TULAV)	3-Apr-2006	Finland	Domestic	Industrials
United Bankers Oyj (HLSE:UNIAV)	29-Nov-2017	Finland	Domestic	Financials
UPM-Kymmene Oyj (HLSE:UPM)	21-Dec-2010	Finland	Domestic	Materials
Valmet Oyj (HLSE:VALMT)	15-Jan-2015	Finland	Domestic	Industrials
Veidekke ASA (OB:VEI)	28-Sep-2010	Norway	Domestic	Industrials
Veidekke ASA (OB:VEI)	22-Dec-1999	Norway	Domestic	Industrials
Venue Retail Group AB (OM:VRG B)	7-Sep-2007	Sweden	Cross-border	Consumer Discretionary
Vestas Wind Systems A/S (CPSE:VWS)	12-Dec-2003	Denmark	Domestic	Industrials
Vestas Wind Systems A/S (CPSE:VWS)	10-Oct-2002	Denmark	Cross-border	Industrials
Vestjysk Bank A/S (CPSE:VJBA)	29-Sep-2008	Denmark	Domestic	Financials
Viking Supply Ships AB (publ) (OM:VSSAB B)	31-Mar-2011	Sweden	Domestic	Industrials
Viking Supply Ships AB (publ) (OM:VSSAB B)	13-Aug-2010	Sweden	Cross-border	Industrials
Viking Supply Ships AB (publ) (OM:VSSAB B)	7-Oct-2004	Sweden	Domestic	Industrials
Vitec Software Group AB (OM:VIT B)	1-Jul-2015	Sweden	Cross-border	Information Technology
Vitec Software Group AB (OM:VIT B)	30-Jun-2014	Sweden	Cross-border	Information Technology
Vitec Software Group AB (OM:VIT B)	20-Dec-2013	Sweden	Cross-border	Information Technology
Vitec Software Group AB (OM:VIT B)	3-Sep-2012	Sweden	Cross-border	Information Technology
Vitrolife AB (publ) (OM:VITR)	26-Jan-2006	Sweden	Domestic	Healthcare
Wilh. Wilhelmsen Holding ASA (OB:WWI)	20-Jun-2005	Norway	Domestic	Industrials
Wilson ASA (OB:WILS)	3-Sep-2008	Norway	Domestic	Industrials

Buyer company	Announcement date	Buyer country	Cross-border	2 digit GICS (Sector)
Wärtsilä Oyj Abp (HLSE:WRT1V)	4-Oct-2017	Finland	Cross-border	Industrials
Wärtsilä Oyj Abp (HLSE:WRT1V)	13-Jul-2011	Finland	Cross-border	Industrials
Wärtsilä Oyj Abp (HLSE:WRT1V)	3-Feb-2006	Finland	Cross-border	Industrials
XANO Industri AB (publ) (OM:XANO B)	18-Dec-2017	Sweden	Domestic	Industrials
XANO Industri AB (publ) (OM:XANO B)	9-Nov-2006	Sweden	Cross-border	Industrials
Xvivo Perfusion AB (publ) (OM:XVIVO)	18-Apr-2016	Sweden	Domestic	Healthcare
YIT Oyj (HLSE:YIT)	19-Jun-2017	Finland	Domestic	Industrials
YIT Oyj (HLSE:YIT)	24-Apr-2002	Finland	Domestic	Industrials
YIT Oyj (HLSE:YIT)	27-Oct-2000	Finland	Cross-border	Industrials
ZetaDisplay AB (OM:ZETA)	22-Aug-2016	Sweden	Cross-border	Consumer Discretionary
ÅF AB (publ)	14-Dec-2016	Sweden	Cross-border	Industrials
ÅF AB (publ)	16-Sep-2013	Sweden	Cross-border	Industrials
ÅF AB (publ) (OM:AF B)	16-Sep-2013	Sweden	Cross-border	Industrials
ÅF AB (publ) (OM:AF B)	18-Oct-2012	Sweden	Domestic	Industrials
ÅF AB (publ) (OM:AF B)	7-Sep-2012	Sweden	Cross-border	Industrials
ÅF AB (publ) (OM:AF B)	25-Nov-2010	Sweden	Domestic	Industrials
ÅF AB (publ) (OM:AF B)	8-May-2006	Sweden	Domestic	Industrials
ÅF AB (publ) (OM:AF B)	30-Jan-2006	Sweden	Cross-border	Industrials
AAK AB (publ.) (OM:AAK)	12-Jul-2005	Sweden	Cross-border	Consumer Staples

Appendix B

League table – top 25 Nordic M&A advisers

League table of financial advisers sorted by deal value in the period from 1998 to February 2018. Only deals with disclosed deal value are included, both buy and sell-side are included, both bidder and target have to be in a Nordic country and full value is assigned to all advisers in a given deal.

Rank	Financial advisor	Value (EURm)	Number of Deals
1	SEB	93.008	301
2	Carnegie Investment Bank	87.591	216
3	Nordea	77.873	166
4	Handelsbanken	65.220	174
5	ABG Sundal Collier	33.492	131
6	Danske Bank	33.035	114
7	Pareto Securities	27.689	117
8	Mandatum & Co	27.524	29
9	DNB	17.771	71
10	Arctic Securities	16.695	66
11	Fondsfinans	15.850	48
12	Swedbank	15.025	50
13	Access Partners	12.997	41
14	FIH Partners	11.816	43
15	Erneholm & Haskel	10.842	27
16	Lenner & Partners	10.668	24
17	Waselius & Wist	9.914	1
18	PK Partners AB	8.116	11
19	Pangea Property Partners	7.577	12
20	First Securities	7.550	44
21	Alfred Berg	6.861	34
22	Conventum Corporate Finance Limited	6.000	10
23	Pohjola Corporate Finance	5.972	20
24	MHS Corporate Finance	5.925	3
25	Leimdorfer	5.746	7

Appendix C

League table – top 25 non-Nordic M&A advisers

League table of financial advisers sorted by deal value in the period from 1998 to February 2018. Only deals with disclosed deal value are included, both buy and sell-side are included, both bidder and target have to be in a Nordic country and full value is assigned to all advisers in a given deal.

Rank	Financial advisor	Value (EURm)	Number of Deals
1	Morgan Stanley	122,886	79
2	Goldman Sachs	108,795	50
3	JPMorgan	85,564	61
4	UBS	70,875	44
5	Lazard	50,235	38
6	Citi	48,872	25
7	Lehman Brothers	45,479	18
8	Deutsche Bank	44,981	38
9	Merrill Lynch	34,710	18
10	Bank of America Merrill Lynch	28,986	7
11	Credit Suisse	24,318	21
12	EY	17,295	95
13	Rothschild	16,608	20
14	PwC	16,148	136
15	Deloitte	14,646	79
16	ABN AMRO	11,930	25
17	Schroder Salomon Smith Barney	7,337	5
18	KPMG	6,465	69
19	Dresdner Kleinwort	6,150	6
20	Global M&A Partners	6,048	41
21	Evercore Inc.	3,653	3
22	Donaldson Lufkin & Jenrette	3,367	5
23	Barclays	3,276	3
24	Salomon Smith Barney Inc.	2,924	3
25	Lilja & Co. AG	2,740	1

Appendix D

Definition of variables

Panel A: Definitions of variables of interest	
CFO/BVoA	Cash flow of operations normalised by book value of total assets
Cash Flow proxy/ BVoA	Operating income before depreciation minus interest expense, taxes (cash and change in deferred taxes), preferred and common dividends normalised by book value of total assets
Low Q	All Tobin's Qs below 1 where Q is measured as market value of bidder's equity at financial year prior to the M&A announcement plus book value of debt, and preferred shares from latest statement before M&A announcement divided by book value of debt, equity and preferred shares (same date)
Within merger wave	Dummy equal to one if target is announced within a merger wave
Outside merger wave	Dummy equal to one if target is announced outside a merger wave
First mover	Dummy equal to one if transaction is one of the first 20% in the merger wave
Late mover	Dummy equal to one if transaction is one of the last 20% in the merger wave
Frequent acquirers	Dummy equal to one if acquirer has made minimum five previous mergers or acquisitions within the last three years from the current transaction date
Non-frequent acquirers	Dummy equal to one if acquirer has not made minimum five previous mergers or acquisitions within the last three years from the current transaction date
Number of prior acq.	Number of completed deals within the same three year period as "frequent acquirers"
Nordic acq. fraction	Fraction of the deals within the same three year period that were Nordic targets
Previous same payment	Fraction of the same type of payment as the current event
Previous same industry	Fraction of deals within the same industry as the target in the current event
Top-tier	Dummy equal to one if bidder used one of the top 8 M&A advisers from illustrated league table (Total M&A advisers) during the acquisition
Non-top-tier	Dummy equal to one if bidder used one of the M&A advisers ranked below top 8 from illustrated league table (Total M&A advisers) during the acquisition
No advise	Dummy equal to one if bidder did not use a M&A adviser during the acquisition
Buy side used adviser	Dummy equal to one if bidder used a M&A adviser during the acquisition
Buy side used adviser x public target	Dummy equal to one if bidder used a M&A adviser during the acquisition of public target
Buy side top 8 public	Dummy equal to one if bidder used one of the top 8 M&A advisers from illustrated league table (Total M&A advisers) during the acquisition of public target
Buy side used Nordic top-tier	Dummy equal to one if bidder used one of the top 8 Nordic M&A advisers from illustrated league table (Nordic M&A advisers) during the acquisition

Buy side used Non-Nordic top-tier	Dummy equal to one if bidder used one of the top 8 Non-Nordic M&A advisers from illustrated league table (Non-Nordic M&A advisers) during the acquisition
Domestic	Dummy equal to one if target country is the same as bidder country
Cross-border	Dummy equal to one if target country is not the same as bidder country
Cash settlement	Dummy equal to one if transaction is settled purely with cash
Equity settlement	Dummy equal to one if transaction is settled purely with equity
Mixed settlement	Dummy equal to one if transaction is settled by a mixture and equity and cash
P/E ratio	Price-Earnings ratio of bidder company calculated as share price divided by earnings per share (EPS)
High valuation (P/E ratio)	Dummy equal to one if P/E ratio is above the median of total P/E ratios
Tobin's Q	Market value of bidder's equity at financial year prior to the M&A announcement plus book value of debt, and preferred shares from latest statement before M&A announcement divided by book value of debt, equity and preferred shares (same date)
High Q	Dummy equal to one if Tobin's Q ratio is above 1
Sales rationale	Dummy equal to one if bidder's deal rationale is enhanced sales/revenue
Cost rationale	Dummy equal to one if bidder's deal rationale is cost savings
Resource rationale	Dummy equal to one if bidder's deal rationale is resource related
Related acquisition	Dummy equal to one if target and bidder firm have the same six-digit GICS code

Panel B: Definitions of control variables

Firm size	Bidder size measured as the logarithm of market capitalisation
Relative size	Ratio between target deal value and bidder market capitalisation
Inside ownership	Percentage of bidder company shares owned by insiders
Leverage	Bidder firm's long-term debt plus short-term debt divided by market value of its total assets measured at the end of the financial year prior to the acquisition
Sigma	Standard deviation of the market-adjusted returns of bidder's stock over a 240-day window
Public target	Dummy equal to one if target is publicly listed
Run-up	Market-adjusted buy-and-hold return of bidder's stock over a 240-day window

Fixed effects - Year	Announcement year of transaction
Fixed effects - Sector	Two-digit GICS code resulting in 11 sectors