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Value Creation in (Serial) Acquisitions - The Nordic Evidence

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Master's Thesis - Finance
NEKN02
Lund University School of Economics and Management
May 2022

Abstract

Evidence of value creation for acquiring companies is revealed by a Nordic sample of acquisitions. The sample of 171 acquisitions, involving 130 acquirers, allows for investigating the performance of companies making several acquisitions. Such serial acquirers also generally create value, but to a lower extent and with a negative trend for each additional acquisition. It is found acquirers gain an average abnormal return of 3.25%, 2.75% and 3.09% in event windows $t \pm 1$, $t \pm 2$ and $t \pm 3$ respectively upon deal announcement. Furthermore, we find single acquirers exhibit a larger average abnormal return than serial acquirers, and correspondingly, we find that value creation tend to decrease with the deal sequence in a logarithmic pattern. By discarding the *theory of diminishing returns* as an explanation, we instead reveal possible agency problems in the Nordics. Conversely, we reject the *organizational learning hypothesis* and *capitalization hypothesis*. Our study suggests that acquisitions can be fruitful for shareholders of bidding firms, yet merely so with the restriction of a single or few deals. The implications of our study is that shareholders in this region can benefit greatly from enhanced corporate governance.

SPECIAL THANKS TO:
Jens Forssbaeck

Contents

1. Introduction

Since the late 1800's, corporations have committed to mergers and acquisitions, henceforth M&A or *acquisitions*. In the bulk of cases, acquisitions come at a sizable cost due to the *acquisition premium*. To justify the premium of the acquisition, the bidder expects substantial synergies from the deal so that the net present value of the investment is positive. A generous amount of research has been done in the field of M&A, yet no common ground has been reached regarding acquirers' value creation in acquisitions. For instance, Franks, Harris, and Mayer (1989) found no significant positive returns for bidders' shareholders in the UK, and Eckbo and Thorburn (2000) found analogous results in Canada. Contrary to these studies, Alexandridis, Antypas, and Travlos (2017) found positive and significant returns for the bidders' shareholders upon acquisition announcement in a more recent study of US deals.

A dominant view in the financial literature is that, whilst premiums indeed are large, synergies may be overestimated. In fact, oftentimes the acquisition premium exceeds the realised payoff, making the acquisition fruitless for the acquirer. On the other hand, due to the considerable premiums, targets almost always gain (Roll (1986)). By studying the performance of acquirers, Kolb (1984) found that learning from experience can be a way to break the *acquirers curse*, empowering firms to successfully create value in acquisitions. In contrast, alternative literature hypothesize that frequent M&A activity can lead to growing managerial overconfidence (see for instance Billett and Qian (2008)). As such, financial performance is presumed to decrease with a ramp up in acquisition frequency and not the opposite, supported also by Keynes rule of *diminishing returns*.

Research on *serial acquirers* is scarce, especially on Nordics samples. Existing literature has neither been able to establish a consistent conclusion on relative performance of serial and single acquirers, nor a consistent definition of the concept. For instance, Aktas, Bodt, and Richard (1996) found that managers can improve acquisition performance from learning by doing (*organizational learning*) whilst Ismail (2008) and Schipper and Thompson (1983) found serial acquirers to underperform single acquirers in two different samples, instead pointing to diminishing returns and managerial overconfidence.

In this paper we aim to explore the serial acquirers in the Nordic region to establish if managers can learn and become acquisition experts, or if repeated acquisitions instead are driven by market inefficiencies, such as mismanagement or a decreased set of attractive targets. Moreover we study if synergies tend to exceed premiums, thus if acquirers gain in the deals. We use a data-set of 171 transactions between 1995-2022 from 130 unique Nordic acquirers. We examine; (1) if acquisitions in our sample are value creating for the bidder, (2) if announcement returns for serial acquirers are lower than for those of single acquirers, and lastly (3) if acquisition performance decrease with the number of formerly completed deals. The Nordic region is particularly interesting due to the lack of previous research in the area, not least regarding serial acquirers. Furthermore, Rose, Sørheim, and Lerkerød (2017) found significant differences between the Nordic region and other regions in M&A characteristics. For instance, they found no significant relationship between target

growth prospects and acquirer return, contrary to evidence from the US, the UK and other European markets. Investigating serial acquirers in this region could therefore provide valuable insights and greatly contribute to the state-of-the-art in the field.

Our findings suggests that acquirers in the Nordic region gain from acquisitions, with an average abnormal return of 3.25% for the event widow $t \in [-1, +1]$ in the sample of unique acquirers. We also find that single acquirers outperform serial acquirers by nearly 100 bps and that the expected abnormal return decreases with the acquisition sequence in a logarithmic fashion, entailing a rejection of the *organizational learning* and *capitalization* hypothesis. Additionally, studying the effects of an industry acquisition intensity index, we reject the *theory of diminishing returns*, and instead underline potential agency problems in the Nordic region.

This paper will be structured as follows: first, a literature review of the research relevant in the field is provided. Thereafter, the hypotheses aimed to be tested on the sample is presented. In the subsequent two sections the method and the data are described and finally the results of the study are presented and discussed.

2. Literature Review & Hypotheses

2.1 Acquirer value creation

Due to the enormity of the acquisition market, with an overall deal value topping $5 trillion in 2021[2], research in this area has been weighty. From investigating US-deals between 1990-2015, Alexandridis, Antypas, and Travlos (2017) concluded that M&A generate value for the shareholders of acquiring firms, with emphasis on the years succeeding the great financial crisis (TGFC) of 2008-2009. Results from the study are robust to diverse post crisis-effects. Authors argue improvements in corporate governance and investor activism after the crisis to be potential rationales for the results. To note, some of these corporate governance improvements likely were initiated in the aftermath of the many corporate scandals of the early 2000s, for instance the Enron scandal, which got worldwide attention. Conforming to these findings, Bradley, Desai, and E. Kim (1988) found a moderate positive average abnormal return of 0.97% on deals from 1963-1984 for acquirers. Naturally this study is less relevant due to the antiquated sample period.

In contrast to the studies introduced above, Franks, Harris, and Mayer (1989) were unable to identify significant positive returns for bidder's shareholders in the UK, although again with a faraway sample reaching from 1955 to 1985. Still, Eckbo and Thorburn (2000) found the same results on a more recent Canadian sample in the period of 1980-2005. From a European data-set, Campa and Hernando (2004) established that shareholders of acquiring firms obtained no abnormal returns on average between 1998-2000, whilst targets on average gained a 9% abnormal return. Nonetheless these results are likely influenced by the strong bull market in the late 1990's, which is not taken into account in the study. Moreover Moeller, Schlingemann, and Stulz (2005) found similar results to those of Campa and Hernando (2004) while investigating a US sample. It was established in the study that although targets seized positive returns upon announcement, the share price of the bidder slightly dropped. Additionally, they found that in a sub-sample of announcements from 1990-1997 results were altered, as bidders gained significant positive abnormal returns in these deals. The turmoil from the dot-com bubble wiped out all gains during 1998-2001 so that a near zero shareholder gain was realized over the entire period.

By collecting data on Nordic firms, Rose, Sørheim, and Lerkerød (2017) studied the cumulative average abnormal return over a variety of event windows. They found significant positive abnormal returns for both acquirer and target, however only so for a very short event window of $t \pm 1$ for the acquirer. Similarly, Goergen and Renneboog (2004) found European banks generated an average abnormal return of 0.7% for its shareholders in a sample of 228 announcements between 1993 and 2000.

In essence, there is no common ground concerning value creation of acquiring firms. On one hand, a few studies point to a near zero or modest negative abnormal

[2] *Global M&A volumes hit record high in 2021, breach $5 trillion for first time*, Nishant (2021), Reuters.

return for bidders. These findings are in line with the perception that acquisitions are destructive, driven mainly by managerial hubris, and that firms should focus on the core business instead. On the other hand, recent research, e.g., by Alexandridis, Antypas, and Travlos (2017), provide an opposing view, that the characteristics of the M&A market could have changed after TGFC to the benefit of bidder's shareholders. To note, the findings of Alexandridis, Antypas, and Travlos (2017) are based on a US sample and to our knowledge, no evidence in support of this hypothesis have been established in neither a European nor a Nordic sample. Although the Nordic M&A market has proven to be different from other global markets (see Rose, Sørheim, and Lerkerød (2017)), TGFC most likely had an impact on corporate governance and investor activism in the European and Nordic region too.

2.2 The drivers behind value creation

There are a variety of theories aimed at trying to explain drivers behind value creation and value destruction in acquisitions. Some of these focus on the attributes of the acquirer, such as how much financial slack the firm has or if the firm finances the deal with cash, shares, debt or a mix. The lion's share of these theories are with reference to agency problems (see Jensen and Meckling (1976) and Jensen (1986)), i.e. management not acting in shareholders' best interest. A clear example of an agency conflict is when managers commit to acquisitions to grow the business in size and gain recognition, whilst not considering the proceeds for outside investors. Other research study the target, rather than the acquirer. For instance, some investigate the impact of integration barriers on bid premiums and abnormal returns, but as this paper is solely focused on acquirers we will put the weight on bidder characteristics. We recommend Mukherjee, Baker, and Kiymaz (2004) or Rose, Sørheim, and Lerkerød (2017) for a discussion of targets' role in acquisitions.

Jensen (1986) suggests agency problems can be mitigated with different corporate governance strategies, e.g., a strict payout policy. Such a policy limits management's ability to misuse any financial slack. In accordance with this theory, Owen and Yawson (2010) found that firms with excessive cash were more likely to acquirer other firms and that such acquisitions more frequently destroyed value. Perhaps, following the philosophy of Jensen (1986), using the financial slack to pay dividends or repurchase shares would have been a wiser choice. Harford (1999) conducted a similar test on a different sample and found uniform results - a negative relationship between excess cash and acquisition performance for acquirers.

The *signaling effect* is a well known financial theory introduced by Myers and Majluf (1984). It postulates that if a firm decides to finance an acquisition by issuing shares, those shares likely are overvalued. Therefore, upon announcement, the equity value of the acquirer will drop as market participants infer that the share price is inflated. Travlos (1987) found that stock-issuing acquirers realized negative returns upon announcement, in line with what is expected from the theory of the signaling effect. On the contrary, Rose, Sørheim, and Lerkerød (2017) found no evidence that choice of payment had an impact on abnormal returns when studying a Nordic sample. Moreover, Delcoure and Hunsander (2006) found evidence of the opposite, namely negative abnormal returns from cash deals only. Alas, no convincing theoretical justification behind the findings are given in the study.

Instead of acquirer and target characteristics, alternative research investigates the variety of acquisition *types*. In general, acquisitions can be categorized as being horizontal, vertical or of conglomerate type. In a vertical acquisition a firm typically buys one of its suppliers, in a horizontal acquisition a firm typically buys a company from the same industry, and if a firm acquirers an unrelated business, it is classified as a conglomerate acquisition. Healy, Palepu, and Ruback (1992) found that "focused" acquisitions generally outperformed those of diversifying kind. These results suggests that vertical acquisitions ought to be preferred by shareholders. Opposed to these findings, Rose, Sørheim, and Lerkerød (2017) found that in a Nordic sample diversifying (conglomerate) acquisitions generated a higher abnormal return for the bidder. In their study, Rose, Sørheim, and Lerkerød (2017) argues that a shareholder might not agree with the idea of investing in the core business, rather prefer diversification.

In continuation, a number of studies focus on the performance of cross-border and domestic deals. The intuition is that a cross-border acquisition enables for a growing market share and increased geographical presence. Nevertheless, such deals are more likely to give rise to integration problems due to language barriers, social differences, and geographical distances. Domestic deals, on the other hand, are associated with uncomplicated integration processes with little to no social and geographical obstacles. Eckbo and Thorburn (2000) investigated a sample of American and Canadian firms and found that Canadian bidders performed superior to American bidders when acquiring Canadian targets. Moreover, Rose, Sørheim, and Lerkerød (2017) found indications of larger positive announcement effects for domestic deals than for cross-border deals, though results were not significant. Altogether, these studies advocate the rationale that a smooth integration process is of greatest importance and that exploring new markets may simply be too costly.

Hazelkorn and Zenner (2004) found conflicting results when investigating merely American acquirers. They found cross-border acquisitions to on average create *more* value for shareholders than domestic deals. The authors propose that more value can be found abroad mainly due to low cost production in other countries, and local technical expertise. Goergen and Renneboog (2004) conducted similar tests on a European sample but found no significant differences. However, they did find that premiums in domestic deals tend to be larger than premiums in foreign deals, perhaps a result of more substantial information asymmetries.

Evident in the former, value drivers in acquisitions are ambiguous and it is more often than not possible to find advantages and disadvantages with each parameter. In this study we control for the bulk of the variables in our regression specifications.

2.3 Serial acquirers

Although an aged phenomena, a rationale behind serial acquisitions has not been established, therefore one must study the serial acquires by applying insight from the more general financial framework. According to the hypothesis of diminishing returns, as formulated by Keynes, the best opportunities ought to be taken first. As the set of possible opportunities decreases, so does the gains. With this logic, the first deal in an acquisition sequence will be the most profitable one. Then, for each subsequent deal, targets likely will become less attractive, perhaps due the

demand of a large premium or a lack of compatibility. Managers should therefore be cautious with multiple acquisitions in succession if they are to maximize the chances of creating value for their shareholders. Studies by Roll (1986) and Malmendier and Tate (2008) find that managers, albeit knowing the next target might not be as attractive as the last one, still commit to serial acquisitions. The reason, according to these studies, is that managers erroneously believe their actions will be value creating anyhow. The actions are thus driven by psychological biases and heuristics according to these theories. Together, the economic principle of diminishing returns and the physiological biases in managers are compelling arguments for unproductive serial acquisition behavior.

On the contrary to the theory of diminishing returns, Aktas, Bodt, and Richard (1996) found that CEOs can improve acquisition performance from learning by doing, or *organizational learning*, discussed in more detail in the following. Kengelbach et al. (2012) found that although the mere quantity of acquisitions will not improve performance, acquiring similar firms might do so - evidence of the *specialized learning hypothesis*.

Another established theory is the *capitalization hypothesis*. The idea is that market participants will assess the values of subsequent deals after the first acquisition in an acquisition program is announced. As such, if one translates the theory literally, no abnormal returns in all subsequent deals (after the first one, which reveals the acquisition plan) should be realized. Naturally, a shortfall of this theory is that it assumes that investors know the value of future deals, although the targets and other circumstances of the deals remain unknown.

Evidence of the theories stated in the above, and on serial acquirers in general, is limited, even more so in the Nordics. In addition studies vary largely and especially so with respect to definitions and methodology.

Ismail (2008) was one of the first to thoroughly investigate multiple acquirers. In a sample of 16,221 US takeover deals ranging from 1985 to 2004 he found that single acquirers outperformed serial acquirers by a significant 1.66%. In the study, the author estimates abnormal returns over a 5-day event window (± 2), and examines abnormal returns for each number of subsequent deals. Although modifying the estimation method for expected returns, the event window is not altered and therefore the robustness of these findings is questionable.

Before Ismail (2008) conducted his research, Schipper and Thompson (1983) found evidence of both the capitalization hypothesis and hypothesis of diminishing returns. By studying the returns of firms announcing acquisition programs, they concluded that the first acquisition generated a positive abnormal return, whilst subsequent deals seized a zero or negative return. Loderer and Martin (1990) validated the results on a more recent sample. Contrasting these findings, the capitalization hypothesis was rejected by Malatesta and Thompson (1985); Asquith, Burner, and Mullins (1983); and Croci and Petmezas (2009). Asquith, Burner, and Mullins (1983) found that abnormal returns remained positive, with significance, through the fourth bid. Correspondingly, Croci and Petmezas (2009) reported significant positive returns for the bidder through the fifth announcement. Malatesta and Thompson (1985) exercised a different approach, yet concluded that firms which had previously announced an acquisition still gained positive abnormal returns for subsequent deals. Albeit a strong theoretical foundation, somewhat analogous to

the efficient market hypothesis, the capitalization hypothesis do not account for the fact that an acquisition program merely reveals the quantity of subsequent deals, not the quality. As mentioned above, the market is, sensibly, incapable of capitalizing on the deals before they are announced by the firm, since their value can not be known in advance. Taking this into consideration, the theory alone is not sufficient to unravel the performance of serial acquirers.

Chao (2018), in contrast to the findings of Aktas, Bodt, and Richard (1996), found no significant effect of past acquisition frequency on current acquisition performance on a US sample over a 14 year period. Thus, the study rejects the organizational learning hypothesis (for a summary of the research on this subject see e.g., Barkema and Schijven (2008)). In essence, the theory suggests that repetitive acquisitions will familiarize management with the acquisition process containing; target selection, deal negotiations, target integration, and due diligence. Therefore, one expects acquisition performance to increase with the deal sequence (J. Kim and Finkelstein (2009)).

In his research, Chao (2018) defines a serial acquirer as a firm that conduct a minimum of 4 acquisitions over a 10-year period. However, in contrast to e.g., Ismail (2008), the dependent variable in the model is acquirers return on assets (ROA) and not abnormal stock return. Using ROA will sidestep the pitfalls of using stock returns (discussed further in section 3.2.1). Nevertheless, ROA is reported by firms on a yearly basis which makes the short-term effects of the deal impossible to measure. Therefore the event study method is unsuitable with this approach. Inadequately the ROA measurement also will be affected by other improvements in the business, which hence makes it difficult to extract the effects from the acquisition alone.

An additional contrast to the findings by Aktas, Bodt, and Richard (1996) is provided by Laamanen and Keil (2008). They studied the organizational learning hypothesis in the 1990's and found that a high acquisition frequency was *negatively* related to performance. Moreover they found that a higher variability of the acquisition rate also negatively influenced performance. Laamanen and Keil (2008) use the same definition of the serial acquirer as does Chao (2018). On the other hand, they use the abnormal stock return as the dependent variable. In contrast to Kengelbach et al. (2012) and Rose, Sørheim, and Lerkerød (2017), Laamanen and Keil (2008) do not estimate the expected return from the market model. Instead they use the adjusted market model, so that the abnormal return is the difference between the observed return and the market return in the event window[3]. The authors argue that, due to the time sensitivity of beta, one can side step erroneous estimations by simply using the pure market return. We would argue that although beta estimates indeed can be imprecise in the market model, exclusively relying on the return of the market as a benchmark for all firms completely ignores risk and will give dubious results.

In summary no consensus has been reached on serial acquirer performance. Some studies accord with the idea of organizational learning, implying that quantity induces quality. Nevertheless, the greater part of the research point to the opposite. As the opportunity set is reduced with each acquisition, returns will diminish, and

[3]As such, in this model, the expected return on asset i at time t, given a set of information Ω_{it}, is given by $E[R^*_{it}|\Omega_{it}] = R^*_{mt}$.

as managerial overconfidence grows, so will the value destruction. Moreover studies covering different geographical regions, measurements of performance, and time periods yield contrasting results. It may be that the acquisition market is less homogeneous than one might have anticipated.

2.4 Hypotheses

The literature review reveals that studies on value creation in M&A produce diverse results. For targets the deal is almost always profitable due to the acquisition premium. However, research on acquirer gains in the deals point in different directions.

A frequently cited and established theory is Jensen (1986), who postulates that agency conflicts driven by e.g., managerial hubris can lead to imprudent acquisition strategies by managers and value destruction. Together with this, the rule of diminishing returns suggest that targets ought to become less attractive with the acquisition sequence. In combination the theories point to serial acquisitions as an unsound activity.

We consider the findings from the current literature, and introduce three hypothesis we aim to investigate on our chosen sample in the following sections.

2.4.1 Value creation

Recent studies, for instance those conducted by Alexandridis, Antypas, and Travlos (2017), found that the M&A climate might have changed after TGFC due to improvements in corporate governance and investor activism. As a large share of the acquisitions in our data is post 2008, apparent from figure 1, and figure 3, we find it fruitful to test the theory on our sample. For a similar yet not as recent Nordic sample Rose, Sørheim, and Lerkerød (2017) found positive, yet mostly insignificant, bidder abnormal returns.

As our sample is similar to that of Rose, Sørheim, and Lerkerød (2017) in terms of geography, and similar to that of Alexandridis, Antypas, and Travlos (2017) in terms of sample period, we theorize that acquirers gain from the announcements, although somewhat in contrast to the traditional convention. We postulate our first hypothesis:

Hypothesis 1: Acquirers realize *positive* abnormal returns in acquisitions.

In other words, hypothesis 1 stipulates that acquisitions are value creating for acquirers.

2.4.2 The serial acquirers

In the last paragraph of section 2.3 we established how most studies suggest that serial acquirers underperform single acquirers and that the abnormal returns decreases with each deal (see e.g., Ismail (2008), Schipper and Thompson (1983) and Loderer and Martin (1990)). Furthermore, Laamanen and Keil (2008) found acquisition performance to decrease with deal frequency. We hence introduce two additional hypotheses:

Hypothesis 2a: Acquirers' abnormal return will decrease with the number of previously completed deals.

Hypothesis 2b: The abnormal return of serial acquirers will be lower than the abnormal returns of single acquirers.

As a consequence of the assessment on the literature on serial acquirers, results consistent with hypothesis 2a would hint managerial hubris/overconfidence or acquirer diminishing returns, alternatively a combination of the two, in the region. Conversely, it would suggest a rejection of the organizational learning hypothesis and provide evidence opposed to the capitalization hypothesis. Hypothesis 2b will distinguish the relative performance of serial and single acquirers, to investigate if one of the two groups perform better than the other.

3. Method

To investigate acquirer value creation upon deal announcement we use the standard approach of measuring the short term effect on stock prices. Instantly when a deal is announced the market reacts to the new information and the perceived value of the transaction is reflected in the stock price (following the theory of Fama, Fisher, et al. (1969)). Although other methods occasionally are used in studies to measure value creation in acquisitions, for instance by Chao (2018) who investigates the change in return on assets of the acquirer, the bulk of the literature accomplished in the field use stock returns and an event study approach (e.g., Laamanen and Keil (2008), Rose, Sørheim, and Lerkerød (2017) and Kengelbach et al. (2012)).

3.1 The Event Study

The event study methodology was first introduced by Brown and Warner (1985), and is thoroughly summarized in MacKinlay (1997). Since the method is widely used in the literature, we describe it briefly and refer to the above-mentioned for a more generous outline.

An event study methodology can be summarized in a few steps:

(i) Define the event together with the estimation window and the event window

(ii) Define the criteria of data selection, i.e. which firms to include to measure the effect of the event

(iii) Estimate the parameters for the model of expected returns (further discussed in section 3.2.1)

(iv) Calculate the normal (expected) returns from the parameters estimated by the model, and thereafter collecting actual (observed) returns

(v) Obtain abnormal returns, i.e. observed returns less expected returns

Essentially, the dexterity of the procedure is that it enables to extract the effect of a particular event on the stock price. By solely using observed returns in the event window it would be impractical to determine the impact of the event on the stock price. The stock price almost certainly would have fluctuated in the event window regardless due to other market forces. Hence, implementing a model to determine the expected return in the event window given "normal" circumstances is required. The objective of the model for expected return is to capture the impact from diverse market movements. Naturally the difference between the observed and expected return for each day denotes the *abnormal return*. The sum of the abnormal returns in the event window denotes the cumulative abnormal return (CAR), and represents the total effect of the event. CAAR denotes the cumulative average abnormal return and manifests the average effect on all firms used in the study.

3.2 Implementation

3.2.1 Cumulative abnormal returns

To model the expected return we rely on the *market model*. The market model is based on the standard Capital Asset Pricing Model (CAPM) framework, portrayed in Fama and French (2004). In short, the model suggests that stock prices are driven entirely by systematic risk (correlation to the market as a whole), rather than idiosyncratic (firm specific) risk. The intuition is that idiosyncratic risk is diversifiable and therefore not priced in the market.

The market model is apt when the relation between the return of the market and the return of the asset is stable over time. We define the return of an asset i over the time period t as:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}. \tag{3.1}$$

Definitions follow those described Fama and French (2004). We use the MSCI World Index as the market portfolio proxy. An alternative approach would be to use a local market index, such as the OMX Nordic 40. We argue that using a global index is the best way to proxy the market portfolio, since it in theory is the portfolio which includes *all* types of assets in the investment universe, thus not only locally. As the index is in a different currency to many of the returns we must assume exchange rate effects are disregardable. Exchange rates will vary, especially in the estimation window, yet we assume these changes on average are zero and that they therefore not significantly will impact the estimated parameters.

The return on the market portfolio from time $t-1$ to t is denoted R_{mt}. We apply the formula in the estimation interval $t \in [-200, -21]$ to estimate the parameters in the model. Intuitively, t is event-specific and will vary with each firm and each acquisition.

We implement event windows $t \in [-3, +3]$ and $t \in [-1, +1]$ in our regressions. Therefore, we have 17 days from the last day of the estimation window to the first day of the event window. This reduces the risk of the parameters in the model for expected returns to be affected by information leakage (Schwert (1996)). Deciding on the length of the event window is a double-edged sword. On the one hand, a longer event window will capture potential information leaks. In some instances news about an acquisition can spread to investors prior to the official announcement. Thus, a too short event window might not include the "actual" announcement and therefore not seize its impact. On the contrary, a longer event window exacerbates inherent noise and will decrease the level of confidence on the isolated effect of the event, since the model used for expected returns never will be flawless. We implement the short event window of $t \pm 1$ for maximum isolation, and the $t \pm 3$ event window to increase robustness. For the parametric tests we also apply a $t \pm 2$ event window. An event window of greater length will often be too noisy, verified by e.g., Rose, Sørheim, and Lerkerød (2017).

Given an information set on asset i (denoted Ω_{it}) at time t, the expected return on asset i according to the market model is:

$$E[R^*_{it}|\Omega_{it}] = \hat{\alpha}_i + \hat{\beta}_i R^*_{mt} \tag{3.2}$$

with parameters $\hat{\alpha}_i$ and $\hat{\beta}_i$ derived from equation 3.1 in the estimation window. We thereafter calculate the abnormal return on each day t for each firm i as:

$$\hat{\varepsilon}^*_{it} = R^*_{it} - E[R^*_{it}|\Omega_{it}]. \tag{3.3}$$

By aggregating the abnormal returns over the complete event window we obtain the CAR. We calculate the CAAR from the simple average of the cumulative abnormal returns for all firms. Below T denotes the number of days in the event window and N the number of firms in the sample.

$$\widehat{CAR}_i = \sum_{t=1}^{T} \hat{\varepsilon}^*_{it}. \tag{3.4}$$

$$\widehat{CAAR} = \frac{1}{N} \sum_{i=1}^{N} \widehat{CAR}_i. \tag{3.5}$$

The CAR enables for a study of the effect of the announced deal for each acquirer. If the CAR is significantly positive for an acquirer it implies that the market has reacted in a positive manner, suggesting the deal to be profitable for shareholders. It is also possible, as discussed in the following section, to determine how firm characteristics and other deal properties impacts acquisition performance.

Evident by the frequency of its use, the event study methodology is considered vigorous. Nevertheless, like almost any other methodology in empirical finance, it is imperfect. Firstly, it relies heavily on the assumption that the market will determine the actual value of the event (acquisition) instantly after it is announced. Therefore we implicitly assume that market participants has the ability to evaluate the perceived synergies against premiums in a matter of days[7]. One can question if the market has this ability, as synergies may not be realised for some time and are remarkably difficult to forecast.

Secondly, following the capitalization hypothesis, it may be that the acquisition already is reflected in the share price. For instance, if management announces a strategy of multiple acquisitions, the market may capitalize all subsequent acquisitions in an instant. Nevertheless one could argue that the market would react when a specific acquisition is announced regardless, since the quality of the deals will vary with the target and the deal specifics.

Lastly, appropriate alternative methods do exist. One of these is the return on assets approach used by for instance Chao (2018). ROA is a common proxy of acquisition performance, as it measures the ability of the firm to capitalize on its assets. Unfortunately ROA is available only on a quarterly or yearly basis in most cases. Therefore the acquisition performance must be studied over a longer period, which makes the event study methodology infeasible. It is very likely that ROA will vary with other elements in the period after the deal and before the next report. These external factors are difficult or impossible to account for, especially over a longer period. Although not perfect, the event study methodology is the most apt for this type of research.

[7] If one believes the efficient market hypothesis to hold, the reaction would be much faster. In theory, it could be seconds or fractions of a second.

3.2.2 Regression specifications

To find the relationship between CARs and our explanatory variables we implement a standard ordinary least squares approach. In doing so we assume every transaction to be independent, in accordance with Aktas, Bodt, and Richard (1996) and Kengelbach et al. (2012). We use a range of control variables mainly inspired by Rose, Sørheim, and Lerkerød (2017) who conducted research on value drivers in Nordic acquisitions.

A variety of regressions are estimated, though the basis regression is specified below.

$$\begin{aligned}\widehat{\mathrm{CAR_i}} = \alpha &+ \beta_1 \mathrm{RDS}_i \\ &+ \beta_2 \mathrm{SIZE}_i \\ &+ \beta_3 \mathrm{CASH/TA}_i \\ &+ \beta_4 \mathrm{ROA}_i \\ &+ \beta_5 \mathrm{PE}_i \\ &+ \beta_6 \mathrm{LEVERAGE}_i \\ &+ \beta_7 \mathrm{CROSS-BORDER}_i \\ &+ \beta_8 \mathrm{CASH}_i \\ &+ \beta_9 \mathrm{RELATEDNESS}_i + \varepsilon_i\end{aligned}$$

RDS represents the relative size of the deal, computed as deal value divided by the bidders total assets. *SIZE* is the natural logarithm of total assets, following e.g., Laamanen and Keil (2008). *CASH* is the amount of cash the acquirer has, as a fraction of total assets, in the most recent fiscal year. *ROA* is that reported in the last fiscal year, similar to the price-to-earnings ratio, denoted *PE*. *LEV* is the leverage (total debt/total assets) computed from the most recent annual report.

Furthermore we introduce three additional control variables. Firstly, we add a cross-border dummy variable to account for the impact of cross-border deals. In their study, Hazelkorn and Zenner (2004) found cross-border deals to exhibit larger returns than domestic deals. To the contrary, Eckbo and Thorburn (2000) and Rose, Sørheim, and Lerkerød (2017) found the opposite to be true. To account for the signaling effect, theorized by Myers and Majluf (1984), we control for deals financed with cash by a binary classification and a dummy variable. We consider a *CASH* deal as a deal being financed with cash, a cash and debt mix, or debt/liabilities. Thus, non-cash deals are those financed partly with shares. In line with e.g., Chao (2018) we also control for *RELATEDNESS* by classifying an acquisition between two firms sharing the same two-digit SIC (Standard Industrial Classification) code as related. In previous literature controlling for public/private targets is quite common, since in theory the bid premiums can differ substantially for such targets, e.g., due to liquidity premiums. However, due to lack of data on many of the targets, we were unable to include this control variable in our study.

In continuation we introduce the serial dummy and the number of previously completed deals. We denote these *SERIAL1*, *SERIAL2* and *#DEALS*. Moreover we test the logarithm of the number of deals, denoted *Log*(*#DEALS*). We classify a serial acquirer as a firm who has completed more than three deals in the past three

years (*SERIAL1*), and more than five deals in the past three years for robustness (*SERIAL2*). This classification differs from that used by Kengelbach et al. (2012), who defines the serial acquirer as a firm with 1 completed acquisition in the past three years. We argue that 1 acquisition in a three year window simply is not enough to be considered a serial acquirer. However if a firm has acquired one firm per year, three years in succession, it ought to be part of the strategy of the business. These are the firms we consider serial acquires. Others, e.g., Laamanen and Keil (2008) use a 10 year rolling window and require at least four acquisitions in this period. Evident, no strict definition of a serial acquirer exists so we rely on the reasoning above. In table 3.1 we display the classifications and how the frequency of serial/single acquirers varies with these definitions. Some researchers discuss the soundness of the fraction of serial acquirers in the sample (see e.g., Kengelbach et al. (2012)). We refrain from doing this, in light of the arbitrary definition of the matter.

Table 3.1: Frequency of serial and single acquirers by classification.

Classification	$\#DEALS > 5$		$\#DEALS > 3$	
	Single	Serial	Single	Serial
Frequency	71	59	50	80
Relative frequency	55%	45%	38%	62%

Lastly, we control for year and industry effects, multicollinearity and use robust standard errors in all regressions.

3.3 Acquirer sampling

In the established literature on serial acquirers (see Kengelbach et al. (2012), Alexandridis, Antypas, and Travlos (2017), Ismail (2008) and Laamanen and Keil (2008) and others) authors do not discuss the implications of allowing the same firm to occur multiple times in the data. Instead, to be able to apply a regression method, the authors assume all deals to be independent.

The awkward implication of not considering the uniqueness of the acquirers is that the same firm can be classified as both a serial and single acquirer in two separate acquisition announcements. The reason is that a more recent deal in the sequence not necessarily must have a higher past deal frequency, since this is determined by a *rolling window*. We illustrate this in table 3.2.

Suppose firm X has two acquisitions in the sample that fulfills the requirements on e.g., minimum deal value and stock return data, announced in 2012 and 2016. The first observation has 7 previously completed deals over a three year rolling window. This, according to the classification used in this paper, would mean the firm is a serial acquirer. To the opposite, for the second announcement occurring later in the sequence, the firm has 2 completed deals in the three year rolling window, making it a single acquirer. Hence, the firm is classified as serial acquirer in one

Table 3.2: Deal sequence of imaginary firm X. The red numbers represent a deal observed in the sample (fulfilling requirements for size, acquisition share etc.).

		First rolling window				Second rolling window				
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
#Deals	2	2	2	3	**1**	0	1	1	**1**	4

period, but not in the other, though only a handful of years separate the two deals. Moreover, to implement a cross-sectional regression, we must assume the deals are independent though they most likely have been executed by the same management following the same strategy, which is yet another shortfall of the approach of using non-unique acquirers.

Another concern with using all announcements is that M&A activity tends to be cyclical, in the same fashion as the general economy. As such, using all deals very likely will create a bias towards selecting deals occurring in a cluster of high activity (many previously completed deals). This causes the number of past deals for each observation and the number of classified serial acquirers to be unrealistically high.

If one instead considers the entire acquisition history these problems are avoided, as the acquisition memory will be infinite. Yet using a rolling window is necessary for just that reason, since otherwise deals from the very distant past would be considered. In these distant periods it is likely that the firm had a different management or a different operative strategy. It needs to be possible for a firm to transform from being a serial acquirer to become a single acquirer, just as firms can change operations drastically over time. How much time to require between deals to assume a profound change in firm strategy and characteristics is however ambiguous.

Alternatively, to solve the problem, one can impose the restriction to allow an acquirer just once (hereafter a *unique* acquirer). No bias towards selecting deals in clusters will prevail in such a case. This, however, means a particular deal must be selected to represent each firm. In this paper we pick the most recent deal as our observation, though one could have instead selected e.g., the largest deal or the first deal. We argue the latest deal best represent each firm and its acquisition history. With this approach we have a sample of unique acquirers, and thus the above described problems are sidestepped. Nevertheless it is not without shortfalls. First, if acquirer performance is hypothesised to decrease with time, there will be a downward bias in the abnormal returns. This follows since the most recent observation, compared to an earlier observation from that same firm, will return less for shareholders, as CARs decrease with the sequence. Second, the sample will be reduced, in our case by 41 observations (24%), making statistical inference more challenging.

We settle for simply conducting the research twice, first with a sample of unique acquirers, and thereafter with a sample allowing for acquirers to occur more than once, though with added weight to the unique case. This, to our knowledge, has not been done previously and adds further strength to the study.

4. Data

4.1 Data selection

We collected all announcements of completed acquisitions from the Zephyr database between January 1995 and March 2022 with a minimum value of SEK 500 million. We chose this time frame since it covers multiple business cycles and times of extraordinary financial distress. The size condition assures that the deals are large enough to impact share prices, and somewhat filters out the firms expected to have insufficient financial data. For inclusion in the sample, we further demand the following:

1. The acquirer is listed on one of the Nordic exchanges[4]
2. Bidder acquirers at least 51% of the target's outstanding shares (assumed full control)
3. Availability of financial statements for the acquirer for the most recent fiscal year prior to announcement
4. Data on stock returns for the bidder for $t - 200$ days prior to announcement and $t + 3$ days after announcement
5. Trading on at least 2/3 of the days in the estimation window and on all days in the event window

For targets we allow for both private and public firms from all regions. In similarity to Hayward (2002) and Moeller, Schlingemann, and Stulz (2005), we include financial firms in the sample. As apparent in table 4.3, the sample would be materially reduced if these were excluded. The announcement date of the transaction and the deal size is what is reported by Zephyr, we classify the announcements of these transactions as *events*. To note, the announcement day, particularly for smaller deals, may not always be correctly reported. One of the advantages of using an event window, rather than an event day, is that the window most likely will capture the announcement effect anyhow.

A frequent problem in event studies is that of non-synchronous and thin trading in the estimation window, causing erroneously low estimated betas. Practices to account for this problem exists, see for instance Scholes and Williams (1977) and Dimson (1979). Unfortunately the approach exhibit varying results in studies, sometimes paradoxically exacerbating the non-trading problem (Cowan (1992)). We follow the intuitive approach of Rose, Sørheim, and Lerkerød (2017) instead, and require trading on 2/3 of the days in the estimation window to reduce the risk of beta underestimation.

For stock returns on the bidding firms we rely solely on the Factset database. Daily stock returns were collected 200 days before the event and 3 days post event. Stock returns, in contrast to the total return index, is oblivious to e.g., dividends

[4] As discussed in section 3, in parts of the analysis we also require acquirers to be unique.

and splits. However using stock returns makes the analysis more straightforward. In addition, simple returns are commonly used in practice, for instance in Laamanen and Keil (2008) and MacKinlay (1997). Since the sample period is relatively short, the risks of a split or large dividend is also presumed low.

We gathered financial information on the acquirers from the latest fiscal report of the year prior to announcement, available on the Factset database. Using last years fiscal report helps to avoid information leakage effects on financial data prior to the announcement (ratios, such as P/E, being affected by rumors). We use the number of previously completed acquisitions reported in the company "M&A summary" section provided by Factset, though we do not count internal transactions, for instance two sub-parts of the same parent company merging.

In total we find 622 transactions from the initial screening. However, a majority of the transactions had to be disregarded due to:

(i) Acquirer not being publicly listed by time of announcement[5]

(ii) A shortage of financial information on the Factset database

(iii) The deal being an internal acquisition

The resulting final sample consisted of 171 observations (from 130 unique acquirers) all fulfilling the above stated requirements. A larger sample would by nature be preferred, but the restriction to Nordic firms, with sufficient data on financials and a not too thinly traded stock, caused the sample to be reduced. Despite the fact the sample is large enough to conduct the research with confidence. A sample of comparable size is common in the recognized literature.

4.2 Data overview

This section provides an overview of acquirer and target geography, financial ratios and deal history, acquirer industry distribution, and the average deal value and deal frequency over time. We display the graphs of the unique acquirers, although statistics for the sample of all deals can be found in the Appendix.

We expect Sweden to contribute the lion's share of the deals, since it is the largest economy in the Nordics. From table 4.1 we validate this proposition, as Swedish firms represent 52% of the total number of bidders. Moreover Norway, Denmark and Finland display similar relative frequencies in the sample, together making up 47% of the total deals. Iceland, being the smallest economy in the region by some margin, naturally represents a tiny fraction of the sample with just one completed acquisition. In line with the findings of Goergen and Renneboog (2004), who found domestic transactions to be more popular than cross-border transactions for European firms, we find that Nordic deals[6] constitute a majority in the sample.

To continue, table 4.1 displays the relative popularity of other European, Asian & Oceanian and North- & South American targets. European targets represent

[5]Unfortunately, Zephyr returned transactions including a bidder *not* listed by the time of announcement. We found no solution to this screening problem, and therefore had to manually filter the data.

[6]Defined as acquirer and target both from the Nordic region.

the bulk, whilst American targets represents the majority of the rest. Perhaps the reason is that targets from countries with similar social, geographical and economic circumstances simplifies the integration process and thus are more appealing. On the other hand, acquiring a target from a predominantly different country might enable for capturing an unexplored market share. In the Nordic case, the smooth integration process appears to be what is considered an attractive target attribute.

Table 4.1: Countrywide acquirer and target distribution. Relative acquirer frequency per country is displayed in the last column.

	Target region				
Acquirer region	Nordics	Europe (rest)	Asia & Oceania	Americas	in %
Sweden	28	20	1	19	52%
Norway	7	6	0	5	14%
Denmark	8	8	1	6	18%
Finland	11	6	0	3	15%
Iceland	0	1	0	0	1%
In total	54 (42%)	41 (32%)	2 (2%)	33 (25%)	(100)%

Next we present the control variables. Table 4.2 exhibits the number of observations, mean, median, standard deviation and min/max of these variables. Our control variables follow those used by Laamanen and Keil (2008), Kengelbach et al. (2012), Rose, Sørheim, and Lerkerød (2017) and to some extent Ismail (2008), although due to lack of financial data on targets, the majority of control variables are based on the bidder. For more detail on the variables we refer to the previous section.

We find that the mean of total assets is considerably larger than the median, which entails that a few very large firms constitute a small part of the total, also evident from the high standard deviation. The same can be said for the relative deal size, which varies drastically between the observations. Notably the mean of the relative deal size is close to 0.8, implying that the deals generally are large investments for the acquirer, though in book value terms since based on reported asset values. Further, price to earnings (P/E) too display a high standard deviation. We anticipated this since firms with exceptional expected growth can be valued at P/E above 100, or as in our case, as high as 458. If a bidder has negative earnings (loss) in the most recent fiscal report the P/E will be negative which inverts the interpretation of the ratio, thus we naturally disregard the P/E ratio in these cases. From the last row in table 4.2 we observe that the average bidder has completed 5.82 acquisitions over the last three years, and that one firm managed to acquire 37 firms over a three year span. However, the past deals reported by Factset can be of varying size, and hence many of these deals likely are trivial.

Table 4.2: Descriptive statistics of control variables. $\#DEALS$ is the number of deals announced in a three year rolling window prior to the event. For leverage we use *total debt* over *total assets*.

Variable	*N*	Mean	Median	Standard dev.	Min	Max
Assets (bSEK)	130	130.5	17.64	544.25	0.26	5591
Deal size/total assets	130	0.78	0.34	1.47	0.01	6.23
Cash/total assets	130	0.11	0.07	0.12	0.00	0.69
Return on assets (ROA)	130	6.06%	5.90%	11.73%	-81.5	58.40
Price to earnings (P/E)	118	36.3	18.9	60.2	1.9	458.3
Leverage	130	26%	24%	17%	0%	69%
#Deals	130	5.82	4.00	7.11	0	37

In table 4.3 we display the industry distribution of the bidders. Drymbetas and Kyriazopoulos (2014) investigated 40 European cross-border deals (1998-2009) executed by financial firms and found that 23% of the financial institutions in the sample were Nordic firms. Hence we would expect financial firms to occupy the bulk of the sample of bidders. To the contrary, financial firms represent barely 13% of the entire sample, making it the third biggest industry, which perhaps can be due to a ramp up in financial regulation after TGFC. The lion's share of acquirers in the data set are manufacturers.

To continue we display a timeline of frequency, and average deal value, over the sample period in figure 1. Apparent from the figure, the deal frequency has increased in the region since 1995, peaking in the 2015-2020 period with a slight drop in the most recent time interval. One should though bear in mind that the most recent interval is shorter than the others, perhaps the reason behind the trend break. As deal values are not inflation adjusted we anticipated the majority of the large deals to be quite recent. We observe that the mean deal sizes have increased in the time period with a regular pace, although 2000-2005 seems to be an exception. The 2000-2005 period was a prosperous one, with flourishing equity markets, which caused valuations to be relatively high during this period. Naturally, inflated prices are oftentimes followed by financial turmoil, in accordance with the conventional debt and macro economic cycle. The impact of the crisis is obvious in the subsequent time period of 2005-2010 as the average deal value drops substantially.

Table 4.3: Acquirer frequency sorted by industry. Definitions follow those of the Zephyr database.

Industry	Frequency	Relative Frequency
Technology, IT and software	16	12%
Energy, forestry and logistics	23	18%
Services	5	4%
Manufacturing	29	22%
Medical technology & pharmaceuticals	14	11%
Food and beverages	6	5%
Properties and construction	13	10%
Retail	6	5%
Financial services	17	13%
Tobacco	1	1%
Total	130	100%

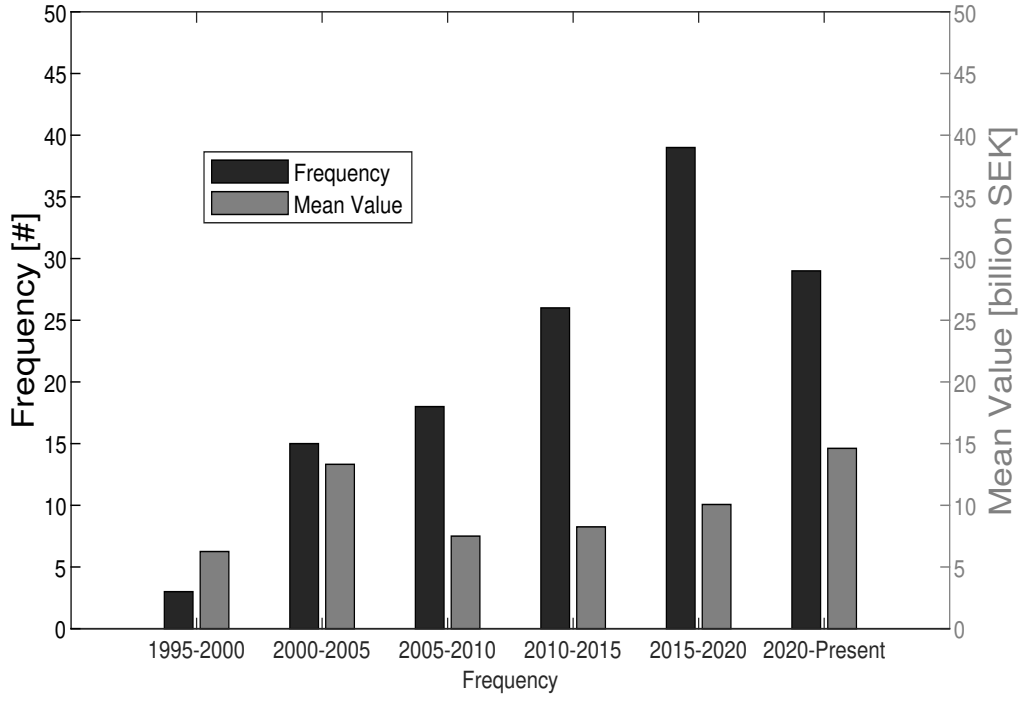

Figure 1: Deal frequency and average deal value over the sample period.

5. Results

Parametric tests for value creation are presented in table 5.1 for unique acquirers and for all deals in table 5.2, and regression results for unique acquirers are displayed in table 5.3 and 5.4, and for all announcements in 7.4 and 7.5. We study of the rule of diminishing returns in table 7.6 and 7.7. In table 7.8 and 7.9 we validate the results with year and industry fixed effects, using dummy variables for all years/industries in the sample period. To control for heteroscedasticity we use robust standard errors in all regression specifications, following White (1980). Lastly, we investigate multicollinearity in figure 6 and table 7.10. The maximum absolute correlation we find is 0.58. In general, an absolute correlation coefficient of >0.7 in any pair of control variables (following Siegel (2016)) would indicate presence of multicollinearity and thus we dismiss multicollinearity problems in the data.

5.1 Value creation and control variables

In this section we begin by investigating hypothesis 1, if acquirers realize positive abnormal returns on average from the acquisition announcements in our sample. Thereafter we discuss the impact of the control variables used in the regressions.

5.1.1 Do acquirers realize positive abnormal returns in acquisitions?

To begin with we study figure 2, headlining the event window. The market appears to react mainly at deal announcement ($t = 0$), with a slight delay as a price reaction occurs also at $t+1$. A market overreaction is noticeable, as the price reverts slightly on day $t+2$ and $t+3$. To note, these are the averages, and thus can disguise some information. For instance, substantial leakages in just one of the firms would not be visible in this graph. From figure 3 we can observe the spread in CARs for all unique acquirers and it is apparent how, as anticipated, the fluctuation is quite substantial regarding announcement abnormal returns.

To study value creation we conduct a parametric test of the cumulative average abnormal returns from the sample. Results for unique acquirers are displayed in table 5.1, and for all announcements in table 7.2. We display the distribution of CARs as daily averages in figure 5.

We find acquirers on average obtain a 3.25% abnormal return with the acquisition announcement, significant at the 0.1% level, when using the $t \pm 1$ event window. For the longer event windows of $t \pm 2$ and $t \pm 3$, the average abnormal return is 2.75% and 3.09% respectively, significant too at the at the 0.1% level. In addition we distinguish the abnormal returns for single and serial acquirers and display the corresponding statistics in table 7.3. We find significant abnormal returns for single acquirers, though not for serial acquirers in the longer event window, when investigating the sample of unique bidders. A significant difference in the CAARs at the 0.1% level is evident. This hints an underperformance of serial acquires, further investigated in the coming sections.

Table 5.1: Parametric test for cumulative average abnormal return of unique acquirers. We assume a standard normal distribution.

	$t \in [-1, +1]$	$t \in [-2, +2]$	$t \in [-3, +3]$
$CAAR$	3.25%	2.75%	3.09%
σ^2	0.47%	0.62%	0.83%
t-statistic	5.41^{***}	3.68^{***}	3.86^{***}
p-*value*	0.00%	0.00%	0.00%
N	130	130	130
Min	-9.12%	-19.80%	-39.08%
Max	27.47%	23.81%	34.03%

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

To complement, we study the intercept from the regressions in table 5.3 and 5.4. The intercept will exhibit CARs in the sample given all control variables are set to zero. We find insignificant positive intercepts for CARs in both event windows, for all model specifications. When including the number of previous deals, and the serial dummy, we find the constant decreases.

By considering table 7.2 we confirm the findings for unique acquirers also for all announcement deals. With the extended sample, results are analogous with CAARs of 2.99%, 2.58% and 2.89% for the event windows $t \pm 1$, $t \pm 2$ and $t \pm 3$ respectively. Intercepts for regressions with all deals included are positive, yet without significance (table 7.4 and 7.5). Consequently, we fail to reject hypothesis 1, as we find positive average abnormal returns for acquirers in the sample, with emphasis on single acquirers.

The findings are in line with those of Alexandridis, Antypas, and Travlos (2017). Similarly, Rose, Sørheim, and Lerkerød (2017) found positive and significant acquirer abnormal returns of 0.98% for the $t \pm 1$ event window. However, for longer event windows, Rose, Sørheim, and Lerkerød (2017) found no significant positive abnormal returns. Our results are somewhat in contrast to these findings, as CAARs in our study does not increase with a shorter event window. Still, the shortest event window has the highest abnormal return. Moreover, we find positive and significant CAARs also for longer event windows.

A similar result to that of Rose, Sørheim, and Lerkerød (2017) was expected since the study is conducted on a Nordic sample, though Rose, Sørheim, and Lerkerød (2017) use a more remote data set. With this more recent investigation we find new evidence in support for the theory postulated by Alexandridis, Antypas, and Travlos (2017), who suggested that acquirer performance have increased after TGFC. The mass of the acquisition announcements used in this research occurred after the crisis of 2008, apparent form figure 3. In conclusion, we find support of an upswing in acquirer performances after TGFC also in the Nordic case.

Table 5.4 shows the regression results from the shorter event window. To note

is that the intercept is many times larger than the intercept of the regression with the longer event window. This was true also when including non-unique acquirers in table 7.5. These results suggests that the substance of positive market reaction occurs near the firms official announcement, and that information leaks therefore are modest. We find the same outcome from the parametric test in table 5.1 and 7.2 where CAARs are higher for the shortest event window. These results were anticipated considering the display of daily ARs in figure 2. As apparent in figure 4 we have an outlier in the short event window $t \pm 1$, as one acquirer with many past deals obtained a large CAR in the event window.

Positive abnormal returns showcase a contrasting view to the capitalization theory, which suggests that abnormal returns on average will be zero in all deals after the first deal is announced. We find that abnormal returns are positive for the first deals, and likely will be positive for some deals later in the sequence, evident by the just slightly negative coefficient in front of the variable $\#DEALS$. To note, some acquirers in our sample had a blank deal history, and the impact of these firms on the results are somewhat concealed.

5.1.2 Financial ratios and acquisition performance

We proceed by studying the control variables used in the regressions in table 5.3, 5.4, 7.4 and 7.5. For robustness we control for industry and year fixed effects in table 7.8 and 7.9 and find results to be generally unchanged. In figure 6 and table 7.10 we display cross-correlations of control variables and find no evidence of potential multicollinearity problems.

First we note how the relative deal size, as defined by the deal value divided by the total assets of the bidder, has a significant positive linear relationship to the realized cumulative abnormal return at a 5% significance level for the $t \pm 3$ event window. The coefficient is roughy 0.35 for all model specifications, both for unique acquirers and for all deals, suggesting a 100 bps increase in the relative deal size yields a 35 bps increase in cumulative abnormal return. In the shorter event window the coefficient was somewhat smaller and without significance. Our results are similar to those found by Kengelbach et al. (2012) who studied acquisition performance on a global sample and found a positive, and significant, linear relationship between relative deal size and acquisition performance.

Intuitively a larger deal, in relative terms, will be riskier for the bidder. In financial theory return is associated with risk, and a riskier investment should yield a greater return. Also, larger deals have a higher chance of affecting the share price (see e.g., Hayward (2002)) and will signal to market participants that management has confidence in the deal. In the same fashion, a relatively larger deal will undoubtedly alert investors, so managers ought to be more confident before committing to these deals.

To the opposite, a larger deal can increase the leverage of the firm if a substantial share of the financing is by debt. Cai and Zhang (2008) finds that taking on more debt oftentimes is not viewed upon as constructive in the eyes of existing shareholders, and will thus cause a drop in the share price. We confirm this by the coefficient for the leverage control variable in our regressions, yet, our results primarily support the rationale in the former, that larger deals manifest confidence and is associated

with a greater expected shareholder gain.

In continuation we find an insignificant and modest negative linear relationship between acquirer value creation and total assets for both unique and non-unique acquirers, for both event windows. This is in line with the findings of Laamanen and Keil (2008). A similar result was found by Rose, Sørheim, and Lerkerød (2017) in the Nordics, although with market capitalization as a measure of size rather than total assets.

Perhaps more noteworthy, we find a negative linear relationship between the fraction of cash over assets and cumulative abnormal returns in both event windows. Results are significant at the 10% level for the $t \pm 3$ CARs. Owen and Yawson (2010) found cash intensive firms on average have a higher acquisition frequency and are outperformed by less cash intensive firms in terms of value creation. Our results point in the same direction. Jensen and Meckling (1976) postulates that excess cash can exacerbate agency problems in a firm. The rationale is that if a firm has more cash to spare, the risk of fruitless investments, entrenchments, and other value destructing actions increases. We conclude that cash intensive firms indeed tend to underperform in acquisitions, a sign of agency problems. Poor acquisition performance can be mitigated by reduced slack, and hence we find support for a strict dividend policy (see Jensen (1986)).

Furthermore, we find an insignificant positive relationship between the acquirers return on assets before the deal and the abnormal returns upon announcement. Return on assets is a measure of a firms profitability on its total assets and if a firm has performed well in the past, generating substantial margins on its investments, ROA naturally will be high. Assets includes goodwill[8], i.e, the price paid above book value for a company in an acquisition. Therefore the ratio is a rough proxy for past acquisition performance. No clear relationship between past and present acquisition performance is evident.

We moreover find a modest negative linear relationship between price to earnings of the acquirer and abnormal announcement returns in all regression specifications. Results are significant at a 5% significance level when including all deals, and at a 10% significance level for unique acquirers. A high P/E ratio implies the market expects the firm to grow substantially over the coming years. Perhaps the market perceives an acquisition as a step in the wrong direction, as the firm invested elsewhere than in the core business. We also find that highly leveraged bidders seem to underperform less leveraged bidders on average. As previously discussed, acquisitions are regularly financed (at least partly) by debt, and increasing leverage tend to reduce the share price (Cai and Zhang (2008)).

An ambiguous relationship was found between abnormal returns and the domestic deal dummy variable, as results vary with the event window definition. Results are insignificant for all model specifications. A negative relationship between domestic deals and performance was found by Laamanen and Keil (2008), Rose, Sørheim, and Lerkerød (2017) and Hazelkorn and Zenner (2004), but the opposite was found by Kengelbach et al. (2012). Our results suggest the geographic location of the target to be irrelevant. For the $CASH$ dummy, assigned 1 if the deal was financed with cash, cash/debt or debt, we found no significant linear relationship. This is

[8]One should take into account that some firms do not have any goodwill in their balance sheet, so ROA does not work well as a proxy for past acquisition performance in these cases.

in contradiction to the hypothesis that cash deals should be preferred by shareholders, following the signaling theory. We moreover find inconclusive results on the $RELATEDNESS$ dummy variable, assigned 1 if the target and the acquirer share the same two-digit SIC code. Our results contrast those of Healy, Palepu, and Ruback (1992) who found focused acquisitions to be more profitable for bidders. We neither find support of more substantial value creation in conglomerate deal types, as found by Rose, Sørheim, and Lerkerød (2017).

5.2 The serial acquirers

In this section we examine hypothesis 2. The hypothesis is divided into two parts, the first examines if historical acquisition frequency is negatively related to current acquisition performance and the second if serial acquirers underperform single acquirers. We begin by investigating the former, hypothesis 2a.

5.2.1 Do serial acquirers excel?

To begin with, we observe from model (ii) in table 5.3 a significant negative linear relationship between the number of previously completed deals and the cumulative abnormal returns at the 5% level. We find the same result for the shorter event window in table 5.4 and for regressions of all deals in table 7.4 and 7.5. For each previously completed acquisition, the expected abnormal return will shrink by 3.4 bps and 5.8 bps (the $t \pm 3$ and $t \pm 1$ case respectively). The results were similar for all deals, with a 2.7 bps and 4.7 bps decrease for the $t \pm 3$ and $t \pm 1$ event windows respectively.

As we suspect the relationship between the number of previous deals and CARs to may be non-linear, we also study $\text{Log}(\#DEALS)$ as an explanatory variable. We find, for all event windows and both samples, a negative and significant relationship between the logarithm of the number of previous deals and the CARs from the deal announcements. For a 10 percent increase in the past deal frequency, CARs are expected to decrease by close to 3 bps. The logarithmic relationship makes intuitive sense. The impact on CAR when having 3 instead of 2 previously completed deals ought to be more substantial than when having 23 instead of 22 former deals. We confirm the results when controlling for year and industry fixed effects in table 7.8 (unique deals) and table 7.9 (all deals). Though some variables are altered, the serial variable is by and large unchanged, and with significance in all models.

In summary, our findings suggest a rejection of hypothesis 2a, and thus the theory of organizational learning, theorizing that managers would improve acquisition performance with the number of previously completed deals due to e.g., experience in due diligence and synergy forecasting. On the contrary we find weak evidence of the theory of diminishing returns, and the proposition of accelerating managerial hubris, as abnormal returns decrease with the sequence. With these results we can not distinguish the effect from the two theories, though we will do this in section 5.3. We can conclude however that in an acquisition chain the first deal will be the most profitable one, and consecutive deals will be less valuable. Furthermore, the relationship appears to be of the non-linear sort, suggesting losses from having one additional past deal in the rolling window are more substantial if the acquirer has

few completed deals than if the firm has plenty. These results are in line with those of Loderer and Martin (1990) and Schipper and Thompson (1983).

5.2.2 Serial acquirers versus single acquirers

Next we study model (iii) displayed in table 5.3, 5.4, 7.4 and 7.5. We observe that the coefficient of the serial dummy is negative, -0.487 and -0.772, for the longer and the shorter event window respectively in the unique acquirer case, and -0.299 and -0.548 for all deal announcements. Results are significant at the 5%-level for the longer event window in the unique acquirer case. Results suggest a serial acquirer, by the soft definition, might reap a 77 bps lower abnormal return than a single acquirer. In table 7.3 we find the CAAR of single acquires (as defined by the *SERIAL1* classification) indeed is greater than that of serial acquirers on average.

For robustness we also introduce a more strict definition of the serial acquirer in the variable $SERIAL2$ in model (iv). In this case we find negative and significant coefficients for all event windows and in both samples. We find serial acquirers may underperform single acquirers by as much as 100 bps in cumulative abnormal returns when announcing a deal.

These results were anticipated, since from model (ii) and (v) we found a negative relationship between the number of previously completed deals and acquisition performance. Hypothesis 2b posits that abnormal returns of serial acquirers is lower than those of single acquirers. We fail to reject this hypothesis, and find clear evidence that a rich past acquisition history of an acquirer should be a red flag for shareholders. Also noteworthy, we find the serial factor to explain a large share of the acquisition performance, with strong significance in essentially all models.

In agreement with these results, Ismail (2008) found that single acquirers overperform serial acquirers by 1.66% on average. Correspondingly Kengelbach et al. (2012), when studying single acquirers as a control group, found multiple deal makers to exhibit significantly lower short-term abnormal returns of 40 bps. Our results align with these findings. Again, results point to managerial overconfidence and diminishing returns in the Nordic M&A market, much like findings in global and European/American markets. The strategy of inorganic growth materialize as an unfruitful one, and just like in the global case, firms gain more from a restrictive acquisition policy. Rose, Sørheim, and Lerkerød (2017) found the Nordic M&A market to differ from global markets in many regards, for instance in growth versus value targets. We find that in the serial context, the Nordic market rather seem profoundly similar to global markets.

5.3 Separating diminishing returns and managerial overconfidence

As defined in the literature review, the two main theories behind unprofitable serial acquisitions is that of agency problems (managerial overconfidence) and the rule of diminishing returns. To extend this study we try to extract the effect of these hypotheses separately. In line with Conn et al. (2004) we do this by distinguishing the impact of diminishing returns from that of managerial overconfidence.

A variety of predictors in regards to the diminishing return hypothesis have been used in previous studies. One of which is the idea that the decline in abnormal returns should be more profound for firms in acquisition intense industries. This follows since the set of possible attractive targets should be smaller in such sectors.

Table 5.2: The acquisition intensity index (AII) per industry in the sample. Data from Statista, though index values are calculations of our own.

Industry	AII	*Industry*	AII
Media & entertainment	8.05	*Energy & power*	7.67
Software	7.10	*IT consulting & services*	6.10
Biotechnology & pharmaceuticals	5.84	*Healthcare equipment& supplies*	5.58
Telecommunications	5.46	*Chemicals*	5.38
Consumer products & services	4.75	*Insurance*	4.70
Machinery	6.69	*Aerospace & defence*	4.60
Containers & packaging	4.48	*Retail*	4.47
Banking	4.40	*Mining*	3.86
Automobiles & components	3.39		

To define the acquisition intensity of the industry we construct an acquisition intensity index (we call this index *AII*) by using M&A and other industry data from Statista. The index is defined as the the number of acquisitions per industry divided by the total number of listed firms per industry, scaled by the natural logarithm. We use global industry statistics and data from fiscal year 2019, being the median acquisition year in the sample. In table 5.2 we display the index for the industries as defined by Statista. The rationale is that if acquisitions are more popular, demand for attractive targets is higher, and the prices of these will be too. Thus, the acquisition premiums will be higher and returns lower. The index will capture the diminishing return effect as CARs should be lower for firms in industries where the index value is higher. If average abnormal returns do not decrease with the index values, other factors are likely at play.

We observe that the most acquisition intense industries are media & entertainment, energy & power and software, all having index values above 7. Traditionally these are industries known for having a handful of sizeable corporations and large entrance barriers. Therefore acquisitions in these industries tend to be relatively popular, since, for instance, expansion by IPO may be unfeasible. Also, inorganic growth is generally lucrative in these industries, since organic growth appears difficult to attain. On the contrary, banking, mining and automobiles & components display low index values.

As the observant reader would have noticed, the firm classifications in this index differ from the classifications used by Zehpyr. Therefore each deal was manually reclassified into these categories to be assigned an index value. Moreover, it may be

that the index values are time dependent, as the acquisition intensity for a specific industry likely will vary slightly over time. Since Statista did not report data for all years in the sample period we were unable to use a dynamic index. Due to acquisition activity varying mainly with the general M&A cycle we argue the index values unlikely would be vastly different if computed on a yearly basis and separately.

From table 7.6 we observe that the abnormal returns for event windows $t \pm 1$ and $t \pm 3$, for both unique acquirers and for all announcements, are not significantly influenced by the acquisition intensity of the industry. Instead, we find a positive and insignificant relationship. If diminishing returns would explain the drop in acquirer performance, this variable would be negative, as a higher value of the AII index means the firm operates in an industry with fewer attractive targets. In table 7.7 we investigate the interactive variable number of deals times the AII index, again we find no significantly revised results from adding this variable. With diminishing returns the coefficient would be significantly negative, as the acquisition performance would decrease with the acquisition intensity of the industry, and particularly so for firms with many deals. As stated, we find no support of this proposition in our sample.

Although we establish how acquirer abnormal returns decrease with the deal sequence, we find no evidence that this would be due to a shrinkage in the set of attractive targets. In the M&A literature the most substantiated theories on value destruction are those of diminishing returns and of agency conflicts. We must reject the former, and thus we conclude that the most probable rationale behind serial acquisitions, since they appear to not create value, is managerial overconfidence. Our results on the performance of cash intensive firms support this proposition, as we find firms with lots of slack will underperform less cash intensive firms. A hubris inflated manager, with much cash at hand, very likely will commit to deals, albeit without a rigorous cost and benefit analysis. Instead, these actions may be driven by empire building and entrenchment heuristics, as size oftentimes matters for CEOs. Merging with another firm may for instance increase the earnings per share, a measure sometimes directly connected to CEO compensation.

Table 5.3: OLS regressions of cumulative abnormal returns ($\mathbf{CAR}_{-3,+3}$) on a variety of control and explanatory variables. The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise. Unique acquirers, t-values based on robust standard errors.

	(i) Basis model		(ii) # Deals		(iii) Serial1		(iv) Serial2		(v) Log(#Deals)	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	0.843	0.338	0.293	0.135	0.323	0.148	0.621	0.287	0.162	0.075
Relative deal size	0.393**	2.737	0.358*	2.496	0.355*	2.568	0.355*	2.474	0.347*	2.425
Log(assets)	-0.016	-0.184	0.022	0.253	0.020	0.225	0.006	0.069	0.034	0.393
Cash/TA	-1.973+	-1.831	-2.016+	-2.009	-1.651	-1.536	-1.787+	-1.674	-1.820+	-1.715
Return on assets (ROA)	0.027	1.640	0.024	1.501	0.022	1.375	0.022	1.374	0.023	1.423
Price to earnings (P/E)	-0.005+	-1.956	-0.005+	-1.944	-0.005+	-1.970	-0.004+	-1.822	-0.004+	-1.869
Leverage	-0.654	-0.843	-0.773	-1.022	-0.572	-0.756	-0.793	-0.977	-0.683	-0.908
Nordic Target	-0.011	-0.045	-0.093	-0.385	-0.088	-0.363	-0.158	-0.633	-0.128	-0.525
Cash	0.031	-0.129	-0.013	-0.053	-0.016	-0.068	0.032	0.132	-0.034	-0.142
Relatedness	0.055	0.226	0.043	0.178	0.082	0.342	0.093	0.389	0.037	0.156
#Deals			-0.034*	-2.181						
Serial1					-0.487*	-2.052				
Serial2							-0.514*	-2.131		
Log(#Deals)									-0.278*	-2.331
R^2	0.186		0.219		0.216		0.218		0.224	
F-statistic	2.734***		2.981***		2.913***		2.954***		3.063***	
N	118		118		118		118		118	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 5.4: OLS regressions of cumulative abnormal returns ($\mathbf{CAR}_{-1,+1}$) on a variety of control and explanatory variables. The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise. Unique acquirers, t-values based on robust standard errors.

	(i) Basis model		(ii) # Deals		(iii) Serial1		(iv) Serial2		(v) Log(#Deals)	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	5.376	1.395	4.268	1.111	4.367	1.131	4.813	1.260	4.051	1.260
Relative deal size	0.273	1.073	0.234	0.929	0.221	0.867	0.205	0.810	0.198	0.780
Log(assets)	-0.176	-1.162	-0.104	-0.678	-0.111	-0.724	-0.129	-0.853	-0.083	-0.539
Cash/TA	-2.732	-1.433	-2.747	-1.458	-2.171	-1.137	-2.346	-1.246	-2.426	-1.290
Return on assets (ROA)	0.032	1.111	0.027	0.950	0.025	0.847	0.023	0.814	0.025	0.875
Price to earnings (P/E)	0.000	-0.062	0.000	0.024	0.005	0.017	0.000	-0.071	0.000	-0.069
Leverage	-0.016	-0.012	-0.226	-0.169	0.105	0.078	-0.179	-0.134	-0.072	-0.054
Nordic Target	0.025	0.059	-0.133	-0.310	-0.177	-0.270	-0.261	-0.594	-0.191	-0.442
Cash	-0.658	-1.514	-0.749^{+}	-1.765	-0.751^{+}	-1.596	-0.672	-1.590	-0.784^{+}	-1.848
Relatedness	0.085	0.119	0.074	0.174	0.138	0.324	0.164	0.388	0.065	0.153
#Deals			-0.058*	-2.098						
Serial1					-0.772*	-1.832				
Serial2							-0.948*	-2.224		
Log(#Deals)									-0.471*	-2.227
R^2	0.101		0.136		0.128		0.140		0.141	
F-statistic	1.353		1.666^{+}		1.550		1.727^{+}		1.728^{+}	
N	118		118		118		118		118	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

6. Conclusion

In this study we provide comprehensive evidence of acquirer performance in the Nordic region between January 1995 and March 2022 from a sample of 171 deal announcements by 130 acquirers. We find that acquirers gain cumulative average abnormal returns of 3.25%, 2.75% and 3.09% for the t±1, t±2 and t±3 event windows respectively. These results are significant at the 0.1% level. Our findings are in contrast to the widespread perception in the M&A literature, stipulating that acquirers tend to lose whilst targets gain in acquisitions. We suggest that the financial crisis in 2008-2009 could have adjusted the market climate, in line with findings of Alexandridis, Antypas, and Travlos (2017), perhaps due to a combination of a ramp up in investor activism and corporate transparency; a fall in equity prices and premiums; as well as low interest rate environment.

Furthermore, we find relative deal size to be positively related to abnormal returns for the acquirer. A 100 bps increase in the relative deal size yields a 36 bps increase in expected abnormal return, significant at the 5%-level for the t±3 event window. Logically, a larger deal displays confidence, which most often induces a positive market reaction. Likewise, a relatively larger deal will naturally impact the stock price to a greater extent. Results are in line with those from similar studies on global samples (see e.g., Hayward (2002)). Moreover we find an insignificant negative relationship between acquirer leverage and CAR, in line with Cai and Zhang (2008). Our findings regarding the impact of acquirers total assets, cross-border/domestic deals, means of payment and relatedness on performance are ambiguous and therefore not further elaborated.

Investigating the past deal frequency we find abnormal returns to decrease by 28 bps (t±3) and 47 bps (t±1) by the logarithm of each previously completed deal, significant at a 5%-level. Results reveal that CARs drop drastically for large increases in the number of previously completed deals, measured in percentage terms. This in mind we reject the hypothesis of organizational learning in our sample. Additionally, we also utilize a dummy variable approach and find proof that serial acquirers underperform single acquires by 51 bps (t±3) and 95 bps (t±1) on average from the sample of unique acquires, and 47 bps (t±3) and 86 bps (t±1) for the sample of all announcements. We moreover find single acquirers significantly overperform serial acquirers in CAARs for both event windows from parametric tests. Furthermore we establish that a bidder with a few number of previous deals should be extra cautious when looking to acquirer a target, as abnormal returns oftentimes are disappointing in such cases. Conversely, a firm with an already rich acquisition history will not be substantially and negatively affected to the same extent when acquiring one more target. In general, we find the number of past deals to have substantial impact on acquisition performance. In studies aimed at finding value drivers in M&A we therefore encourage to consider this parameter.

By introducing an industry acquisition intensity index we test if the theory of diminishing returns can explain the declining acquirer CARs. We find no evidence that a reduced set of attractive targets would explain our findings. Therefore, instead, we suggest agency conflicts (managerial overconfidence, hubris and empire building) as the most probable explanation. We find added support of this conclu-

sion also from a significant negative relationship between the fraction of excess cash over total assets and CAR of the acquirers.

Our findings have theoretical implications in that acquirers *can* create value from acquisitions, yet can do so solely for one or a very few number of deals. As the number of deals increases, targets become less attractive, and agency problems exacerbates. We find that managerial overconfidence is the most probable reason behind the results. Investor activism and other governance mechanisms in this region are thus not satisfactory, as managers misuse the firms capital to the loss of shareholders. Perhaps a managerial structure that aligns managers more appropriately with shareholders would be beneficial. Such a structure could be CEO compensation being based on abnormal returns in acquisition announcements or the change in ROA, alternatively a more rigid board investigation when managers commit to multiple deals in succession, as the board should anticipate the risks of such a strategy. A problem sometimes raised in the literature (see e.g., Armstrong et al. (2022)) is that CEO compensation is tied to earnings per share (EPS), or other performance metrics, which not necessarily measure performance adequately. EPS normally increases with an acquisition, so perhaps limiting the use of such compensation packages would contribute to shareholders.

Future research can benefit from investigating the trend in value creation for targets in the period after the great financial crisis of 2008-2009, which seems to be an extraordinary period historically. In addition, investigating other measures of value creation, such as return on assets or earnings, can provide fruitful results.

As necessary with all research, we present a few limitations of this study. First, we allow for both public and private targets, thus do not control for any target specifics. This was a necessity to not reduce the sample too considerably. Second, although limiting the affect of thin trading, we can not with great confidence assure parameters from the market model are correct. Expected returns may therefore in some cases be imprecisely estimated.

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7. Appendix

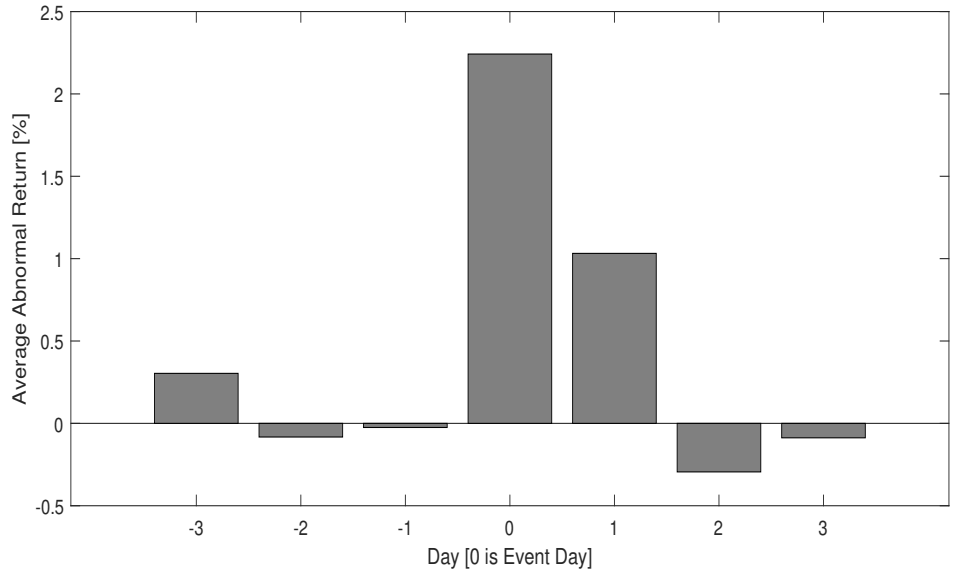

Figure 2: Average abnormal returns for acquirers in the event window.

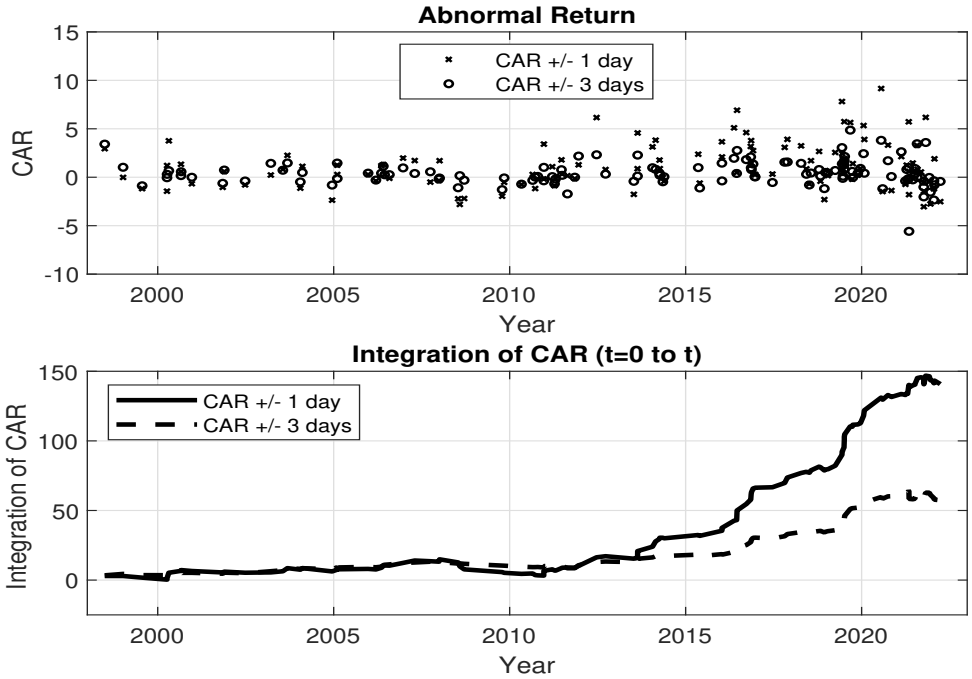

Figure 3: Top graph: CARs for event windows $t \pm 1$ and $t \pm 3$ over time. Bottom graph: Cumulative sum of CARs over time. Both figures based on data from unique deals.

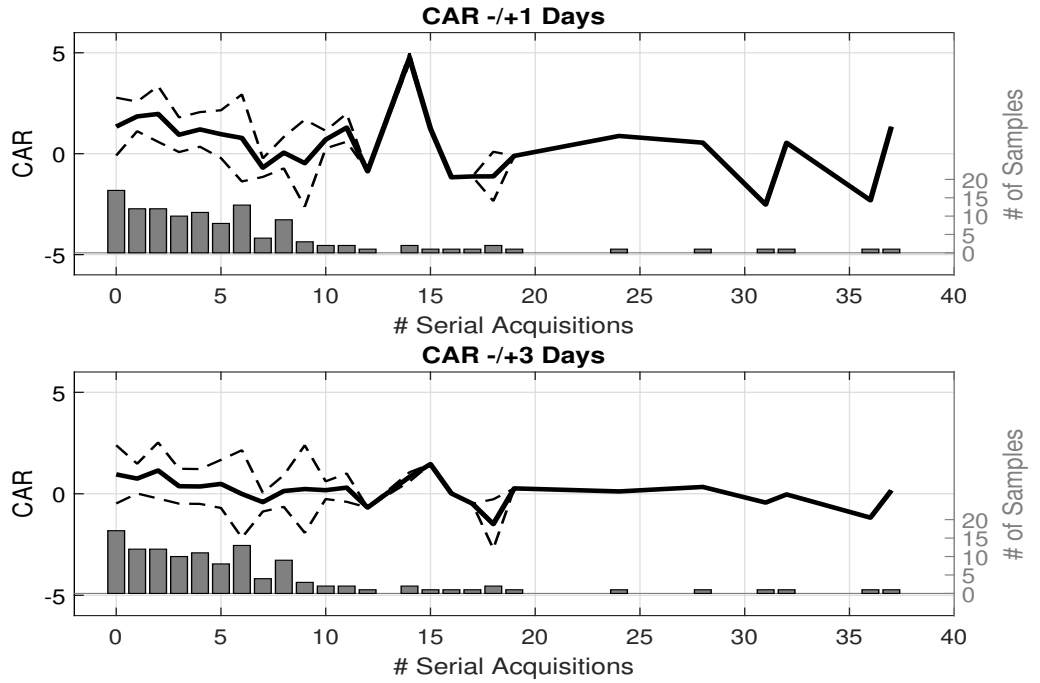

Figure 4: Daily average CARs over #Deals, including ± 1 standard deviation. Unique deals.

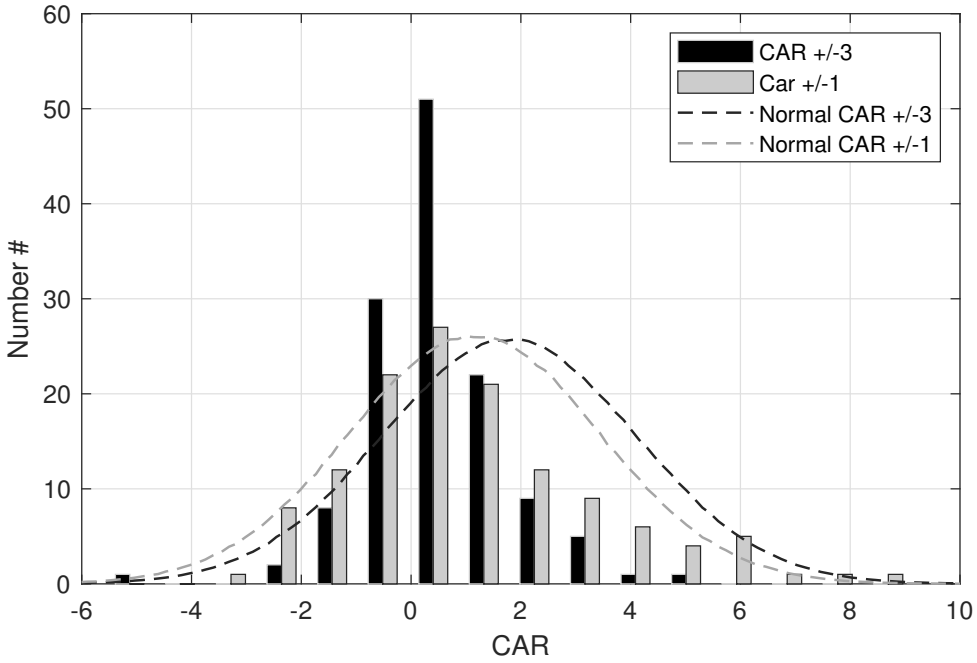

Figure 5: Distribution of daily average CARs and a normal distribution for comparison.

Table 7.1: Descriptive statistics of control variables used in the regressions of all acquisition announcements. $\#DEALS$ is the number of deals announced in a three year rolling window prior to the event. For leverage we use *total debt* over *total assets*. The same statistics, for unique acquirers, can be found in table 4.2.

Variable	*N*	Mean	Median	Standard dev.	Min	Max
Assets (bSEK)	171	129.6	28.05	479.5	0.26	5591
Deal size/total assets	171	0.65	0.28	1.31	0.01	6.23
Cash/total assets	171	0.11	0.08	0.12	0.00	0.69
Return on assets (ROA)	171	6.19%	5.90%	10.38%	-81.5%	63.24%
Price to earnings (P/E)	159	32.81	17.60	53.07	1.9	458.3
Leverage	171	26%	25%	16%	0%	69%
#Deals	171	5.39	5.00	6.93	0	37

Table 7.2: Parametric test of cumulative average abnormal returns for all deal announcements. We assume a standard normal distribution. For unique deals see table 5.1.

	$t \in [-1, +1]$	$t \in [-2, +2]$	$t \in [-3, +3]$
CAAR	2.99%	2.58%	2.89%
σ^2	0.46%	0.58%	0.73%
t-statistic	5.77^{***}	4.17^{***}	4.41^{***}
p-value	0.00%	0.00%	0.00%
N	171	171	171
Min	-17.25%	-24.62%	-39.08%
Max	27.47%	23.81%	34.03%

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 7.3: CARs for single acquires and serial acquires, as classified by the *SERIAL1* dummy, for different event windows. Values are based on the sample of unique acquirers, and we assume a normal distribution. Significance level notations follow those of table 7.2. Mean differences in percentage points.

	$CAR_{-3,+3}$		$CAR_{-1,+1}$	
	Single	Serial	Single	Serial
Mean	4.18%	0.75%	5.21%	1.26%
σ^2	0.83%	0.76%	0.53%	0.67%
t-statistic	4.99***	1.07	8.09***	1.75*
p-value	0.00%	0.14%	0.00%	0.04%
$\Delta Mean$	4.43		3.95	
t-statistic	41.19***		57.56***	
p-value	0.00%		0.00%	

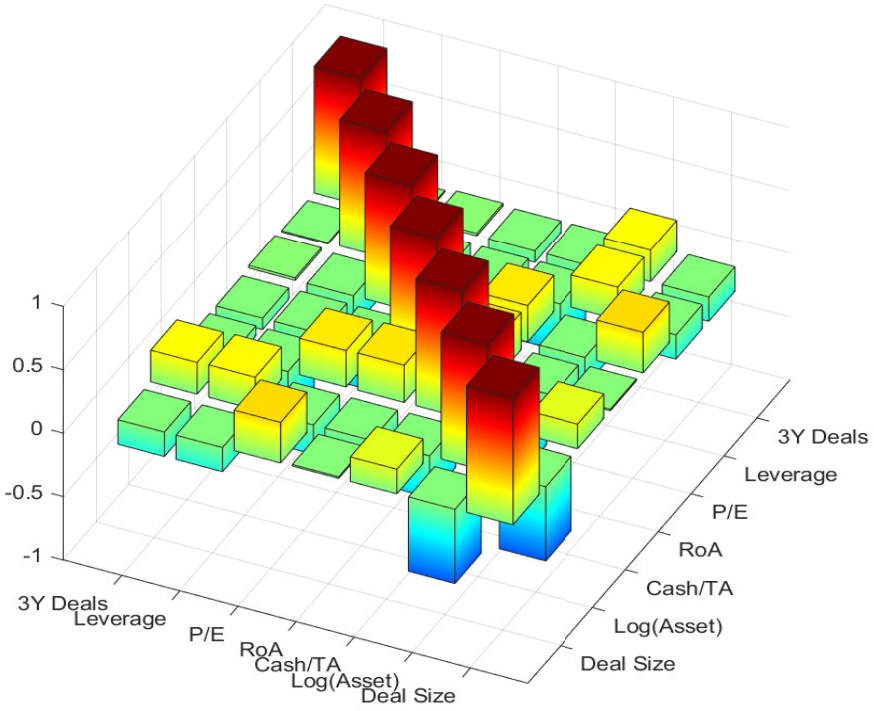

Figure 6: Cross-correlation matrix of control variables. Color range from purple ($\rho = -1$) to maroon ($\rho = +1$). For exact values see table 7.10

Table 7.4: OLS regressions of cumulative abnormal returns ($\mathbf{CAR}_{-3,+3}$) from *all* announcements on a variety of control and explanatory variables. The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise and t-stats are based on robust standard errors.

	(i) Basis model		(ii) # Deals		(iii) Serial1		(iv) Serial2		(v) Log(#Deals)	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	1.232	0.466	1.079	0.589	1.227	0.667	1.226	0.676	1.097	0.597
Relative deal size	0.313**	2.713	0.349*	2.631	0.343*	2.556	0.337*	2.550	0.337*	2.518
Log(assets)	-0.012	-0.198	-0.014	-0.201	-0.022	-0.300	-0.020	-0.284	-0.012	-0.163
Cash/TA	-1.483+	-1.842	-1.657+	-1.886	-1.428	-1.590	-1.468+	-1.663	-1.521+	-1.709
Return on assets (ROA)	0.013	1.155	0.018	1.247	0.017	1.161	0.016	1.112	0.018	1.179
Price to earnings (P/E)	-0.005*	-2.162	-0.005*	-2.133	-0.005*	-2.165	-0.004*	-2.059	-0.004*	-2.096
Leverage	-0.762	-1.097	-0.770	-1.153	-0.643	-0.959	-0.738	-1.114	-0.695	-1.041
Nordic Target	-0.100	-0.497	-0.093	-0.485	-0.092	-0.445	-0.176	-0.859	-0.125	-0.611
Cash	0.072	0.378	0.067	0.330	0.043	0.213	0.090	0.447	0.057	0.279
Relatedness	0.092	0.308	0.083	0.421	0.088	0.445	0.124	0.630	0.080	0.403
#Deals			-0.027*	-1.995						
Serial1					-0.299	-1.509				
Serial2							-0.468*	-2.451		
Log(#Deals)									-0.182+	-1.828
R^2	0.155		0.170		0.161		0.181		0.167	
F-statistic	2.994***		3.034***		2.835***		3.272***		2.959***	
N	159		159		159		159		159	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 7.5: Ordinary least squares regressions of cumulative abnormal returns ($\mathbf{CAR}_{-1,+1}$) from *all* announcements on a variety of control and explanatory variables. The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise and t-stats are based on robust standard errors.

	(i) Basis model		(ii) # Deals		(iii) Serial1		(iv) Serial2		(v) Log(#Deals)	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	4.995	1.529	5.108	1.542	5.375	1.612	5.354	1.635	5.114	1.542
Relative deal size	0.104	0.764	0.119	0.830	0.186	0.769	0.175	0.774	0.175	0.723
Log(assets)	-0.132	-1.242	-0.144	-1.108	-0.155	-1.194	-0.153	-1.194	-0.137	-1.047
Cash/TA	-1.995	-1.324	-2.598	-1.619	-2.183	-1.346	-2.226	-1.416	-2.235	-1.465
Return on assets (ROA)	0.018	0.732	0.020	0.745	0.018	0.661	0.016	0.603	0.018	0.675
Price to earnings (P/E)	0.000	0.021	0.000	0.033	0.000	-0.009	0.000	0.122	0.000	0.670
Leverage	-0.488	-0.421	-0.528	-0.438	-0.301	-0.249	-0.472	-0.397	-0.397	-0.329
Nordic Target	-0.068	-0.190	-0.070	-0.191	-0.059	-0.160	-0.213	-0.576	-0.119	-0.323
Cash	-0.426	-1.156	-0.427	-1.292	-0.514	-1.398	-0.429	-1.182	-0.490	-1.341
Relatedness	0.172	0.459	0.179	0.501	0.189	0.525	0.254	0.716	0.713	0.483
#Deals			-0.047^{+}	-1.951						
Serial1					-0.548	-1.530				
Serial2							-0.862*	-2.449		
Log(#Deals)									-0.336^{+}	-1.871
R^2	0.998		0.110		0.101		0.124		0.108	
F-statistic	1.793^{+}		1.831^{+}		1.667^{+}		2.098*		1.797^{+}	
N	159		159		159		159		159	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 7.6: OLS regressions of cumulative abnormal returns, $\mathbf{CAR}_{-3,+3}$ and $\mathbf{CAR}_{-1,+1}$ introducing the industry acquirer intensity index (AII). The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise, and t-stats are based on robust standard errors. Model (i) and model (iii) are for unique acquirers, (ii) and (iv) for all announced deals.

	(i) $CAR_{-3,+3}$		(ii) $CAR_{-3,+3}$		(iii) $CAR_{-1,+1}$		(iv) $CAR_{-1,+1}$	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	-0.038	-0.017	1.011	0.548	3.872	0.991	4.985	1.495
Relative deal size	0.343*	2.403	0.333*	2.483	0.199	0.791	0.169	0.698
Log(assets)	0.204	0.276	-0.022	-0.292	-0.095	-0.621	-0.152	-1.131
Cash/TA	-1.808^{+}	-1.706	-1.511^{+}	-1.695	-2.416	-1.284	-2.338	-1.452
Return on assets (ROA)	0.022	1.352	0.016	1.097	0.026	0.890	0.017	0.610
Price to earnings (P/E)	-0.005^{+}	-1.941	-0.005*	-2.171	0.000	0.018	0.000	-0.025
Leverage	-0.602	-0.793	-0.663	-0.934	0.016	0.012	-0.302	-0.247
Nordic Target	-0.089	-0.364	-0.110	-0.532	-0.110	-0.252	-0.097	-0.260
Cash	-0.015	-0.065	0.069	0.340	-0.754^{+}	-1.808	-0.471	-1.279
Relatedness	-0.001	-0.006	0.064	0.322	0.039	0.091	0.150	0.415
Log(#Deals)	-0.271*	-2.267	-0.176^{+}	-1.758	-0.471*	-2.213	-0.327^{+}	-1.811
AII	0.082	0.694	0.059	0.637	0.072	0.334	0.087	0.523
R^2	0.229		0.169		0.145		0.110	
F-statistic	2.856***		2.716***		1.627		1.651^{+}	
N	118		159		118		159	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 7.7: OLS regressions of cumulative abnormal returns, $\mathbf{CAR}_{-3,+3}$ and $\mathbf{CAR}_{-1,+1}$ introducing the industry acquirer intensity index (AII) and an interactive term. The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise, and t-stats are based on robust standard errors. Model (i) and model (iii) are for unique acquirers, (ii) and (iv) for all announced deals.

	(i) $CAR_{-3,+3}$		(ii) $CAR_{-3,+3}$		(iii) $CAR_{-1,+1}$		(iv) $CAR_{-1,+1}$	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	-0.106	-0.406	0.869	0.467	2.599	0.643	4.673	1.347
Relative deal size	0.351*	2.476	0.338*	2.522	0.207	0.823	0.173	0.478
Log(assets)	0.014	0.162	-0.022	-0.297	-0.109	-0.710	-0.155	-1.146
Cash/TA	-1.882^{+}	-1.789	-1.594^{+}	-1.773	-2.525	-1.343	-2.342	-1.450
Return on assets (ROA)	0.020	1.231	0.017	1.102	0.023	0.797	0.016	0.590
Price to earnings (P/E)	-0.005^{+}	-1.879	-0.005*	-2.188	0.000	0.075	0.000	-0.023
Leverage	-0.637	-0.847	-0.684	-1.009	-0.031	-0.023	-0.339	-0.276
Nordic Target	-0.028	-0.113	-0.096	-0.468	-0.030	-0.069	-0.086	-0.214
Cash	-0.004	-0.017	0.080	0.391	-0.741^{+}	-1.780	-0.459	-1.236
Relatedness	0.013	0.055	0.066	0.329	0.053	0.126	0.155	0.427
Log(#Deals)	0.729	1.195	-0.018	-0.718	0.824	0.755	-0.034	-0.030
AII	0.308^{+}	1.722	0.082	0.855	0.364	1.139	0.155	0.594
AII x *Log(#DEALS)*	-0.185^{+}	-1.671	-0.014	-0.429	-0.240	-1.210	-0.053	-0.338
R^2	0.248		0.174		0.156		0.111	
F-statistic	2.891***		2.571***		1.513		1.651^{+}	
N	118		159		118		159	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 7.8: OLS regressions of cumulative abnormal returns, $\mathbf{CAR}_{-3,+3}$ and $\mathbf{CAR}_{-1,+1}$ controlling for industry and year fixed effects. The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise, and t-stats are based on robust standard errors. Unique deals.

	(i) $CAR_{-3,+3}$ (ind. effects)		(ii) $CAR_{-3,+3}$ (year effects)		(iii) $CAR_{-1,+1}$ (ind. effects)		(iv) $CAR_{-1,+1}$ (year effects)	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	0.615	0.254	0.456	0.325	3.764	0.876	3.973	1.305
Relative deal size	0.343*	2.331	0.338*	0.208	0.208	0.794	0.189	0.672
Log(assets)	0.011	0.113	0.028	0.397	-0.079	-0.459	-0.082	-0.568
Cash/TA	-1.825^{+}	-1.713	-1.794^{+}	-1.706	-2.535	-1.338	-2.452	-1.283
Return on assets (ROA)	0.024	1.231	0.023	1.427	0.029	0.990	0.026	0.894
Price to earnings (P/E)	-0.004^{+}	-1.172	-0.005*	-2.057	0.001	0.238	0.000	-0.062
Leverage	-0.592	-0.760	-0.645	-1.023	0.100	0.072	-0.089	-0.122
Nordic Target	-0.109	-0.441	-0.122	-0.568	-0.126	-0.069	-0.082	-0.234
Cash	-0.018	-0.074	0.060	0.268	-0.713	-1.655	-0.405	-1.121
Relatedness	0.015	0.060	0.061	0.367	0.078	0.180	0.105	0.183
Log(#Deals)	-0.287*	-2.335	-0.244*	-2.214	-0.503*	-2.324	-0.477*	-2.319
R^2	0.233		0.228		0.148		0.153	
F-statistic	2.431***		2.328***		1.392		1.421	
N	118		118		118		118	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 7.9: OLS regressions of cumulative abnormal returns, $\mathbf{CAR}_{-3,+3}$ and $\mathbf{CAR}_{-1,+1}$ controlling for industry and year fixed effects. The *Nordic target* variable is a dummy assigned 1 if target is from a Nordic country and 0 otherwise, and t-stats are based on robust standard errors. All deals.

	(i) $CAR_{-3,+3}$ (ind. effects)		(ii) $CAR_{-3,+3}$ (year effects)		(iii) $CAR_{-1,+1}$ (ind. effects)		(iv) $CAR_{-1,+1}$ (year effects)	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Constant	1.470	0.735	1.112	0.656	4.635	1.277	5.109	1.449
Relative deal size	0.337*	2.475	0.335*	2.520	0.194	0.781	0.155	0.725
Log(assets)	-0.031	-0.391	-0.018	-0.223	-0.120	-0.836	-0.139	-1.007
Cash/TA	-1.430	-1.594	-1.552^{+}	-1.721	-2.364	-1.452	-2.242	-1.467
Return on assets (ROA)	0.017	1.156	0.018	1.144	0.019	0.699	0.018	0.678
Price to earnings (P/E)	-0.005*	-2.096	-0.005*	-2.141	0.000	0.120	0.000	-0.083
Leverage	-0.678	-0.986	-0.694	-1.067	-0.306	-0.225	-0.399	-0.329
Nordic Target	-0.112	-0.588	0.098	0.224	-0.092	-0.244	-0.108	-0.312
Cash	0.055	0.268	0.057	0.309	-0.476	-1.285	-0.493	-1.311
Relatedness	0.070	0.347	0.097	0.388	0.174	0.476	0.173	0.469
Log(#Deals)	-0.179^{+}	-1.776	-0.183^{+}	-1.829	-0.345^{+}	-1.890	-0.335^{+}	-1.874
R^2	0.177		0.178		0.110		0.121	
F-statistic	2.392***		2.377***		1.375		1.399	
N	159		159		159		159	

Note: Significance levels: $^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, $^{***}p < 0.001$.

Table 7.10: Cross-correlations of control variables. Results are displayed graphically in figure 6.

Variable	Relative deal size	Total assets	Cash over total assets	Return on assets	Price to earnings	Leverage	$\#DEALS$
Relative deal size	1.00	-0.58	0.19	0.01	0.32	-0.19	-0.19
Total assets	-0.58	1.00	-0.33	-0.18	-0.23	0.25	0.25
Cash over total assets	0.19	-0.33	1.00	0.29	0.29	-0.37	-0.08
Return on assets	0.01	-0.18	0.29	1.00	-0.34	-0.26	-0.09
Price to earnings	0.32	-0.23	0.29	-0.34	1.00	-0.16	0.02
Leverage	-0.19	0.25	-0.37	-0.16	-0.26	1.00	-0.01
$\#DEALS$	-0.19	0.25	-0.08	-0.09	0.02	-0.01	1.00