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# What Are the Determinants of Abnormal Returns to Bidders?

## An Event Study of Norwegian Bidders Listed on Oslo Stock Exchange

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## Abstract

We examine the abnormal returns of 158 mergers and acquisitions announced between 2001 and 2018, in which the bidder was a Norwegian firm listed on the Oslo Stock Exchange. We use an estimation window of [-147,-22] trading days and two event windows of [-5,5] and [-1,1] trading days. The results indicate that, on average, the returns to the bidding firms are significant and positive over a three day window, albeit marginally so. The returns to bidders were significant and positive between 2007 and 2012, but we attribute this to economic conjunctures and external factors. We find no evidence for relatedness increasing the abnormal returns to the bidders.

Acknowledgments

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# Chapter I.

## Introduction

During their lifetime, a significant amount of people all over the world are going to experience that the firm they work for undergo a merger or an acquisition. There are large amounts of money involved and the value of mergers and acquisitions worldwide in 2018 alone amounted to more than 3,8 trillion USD, according to The Institute for Mergers and Acquisitions and Alliances.

Many studies show that mergers and acquisitions give varying results for the bidder. Many highlight the variation in acquirers' abnormal returns even though they on average are close to zero. Even fewer so have researched bidders' abnormal returns on Oslo Stock Exchange in particular. Solibakke (2002) investigated Norwegian acquirers in the time period of 1983 to 1994. He finds no significant abnormal returns to Norwegian acquirers. This is consistent with a lot of the literature. A lot has happened since then: the dot-com bubble, the financial crisis of 2007-2009 and the technological development overall. We are interested in investigating if the returns to bidders after 2000 have changed since then, there is no recent literature on the returns to bidders listed on Oslo Stock Exchange.

This paper is structured as follows: In Chapter 2, we give an overview of the literature on returns to the bidder and event study methodology, and then we formulate the hypotheses in Chapter 3. We present and explain the methodology in Chapter 4 and the data in Chapter 5. Chapter 6 describes and explains the univariate and cross-sectional analyses. Finally, we summarize and give some remarks in chapter 7.

# Chapter II.

# Literature

In this section we give a brief summary of the most prevalent research on bidder returns and methodology of event studies.

## Previous Research

It is not always easy to assess the effect of an acquisition announcement on the value of the bidder. The size and value of the bidder might be so big relative to that of the target, that no matter if the acquisition is good or bad, it will not make a noticeable change in the value of the bidder at all. It is also a lot more difficult for the bidder to value smaller, private firms than publicly traded firms. We have structured the research into three categories: Consideration structure, firm characteristics and relatedness.

### Consideration Structure

The method of payment is an important part of mergers and acquisitions. Signaling theory tells us that firms which pay using stocks signal that their own firm is overvalued. If the payment is in the form of stocks, the target will have to share the bidder's risk of overpaying. Travlos (1987) finds that cash-financed bids earn “normal returns”, while stock-financed bids lead to significant losses. He attributes his findings to signaling theory. Eckbo and Thorburn (2000) find that for domestic bidders, the abnormal returns on the announcement day are greatest when the offer involves stock payment. They conclude that bidders should do a stock transaction when it is hard to correctly valuate the target, and a cash transaction if it is hard to correctly valuate their own company. Fuller, Netter and Stegemoller (2002) find that bidders earn more when they offer shares. Martin (1996) finds that the returns to the acquirer are greater at the announcement day when doing a cash transaction as opposed to a stock transaction or a

combination deal. Furthermore, Martin finds that when there is a high uncertainty about the bidder company's value, a stock transaction is more likely to occur. Andrade, Mitchell and Stafford (2001) find significant negative returns to the bidder when they offer stocks, while the results for acquisitions made with no stocks are insignificant.

## Firm Characteristics

Fuller, Netter and Stegemoller (2002) find that the abnormal returns to the bidder are positive when the target is a private firm or a subsidiary, while the abnormal returns to the bidder are negative for public targets. The results show that the returns when acquiring private companies or subsidiaries increase when the payment is made by equity, and that it is the opposite for public firms. They suggest that the liquidity effect may be one of the reasons why private firms or subsidiaries give a positive return compared to public firms. This liquidity discount is meant to offset the fact that it may not be easy to sell the firm in the future, as it may attract few buyers.

Targets that are privately owned, especially small ones, usually have a problem in informing the value of the firm to potential bidders. Public companies have a public value (i.e. the market prices on its stocks) which private companies do not have (Akerlof, 1970). It is therefore often difficult to value a private firm. The bidder will usually consider the possibility of doing a bad purchase when bidding, but bidders of private companies still often overvalue the target. One of the explanations can be that there is information asymmetry. Koeplin et al. (2000) find that private firms in the U.S. acquired by a U.S. firm are on average traded at 20-30% discount, and that the discounts are even larger for foreign firms.

Privately owned companies have fewer potential acquirers competing over them due to them often being invisible in the big picture, relative to public firms. There is less marketing and usually very little publicly available information on them. The negotiation power also differs between private and public firms. For public firms, the negotiation process works in a similar fashion to an auction. There is an abundance of publicly available information and other bidders can easily participate. Technically, a private company can get the same kind of characteristics if enough bidders know about the firm, though that is very often not the case. For private companies the welfare of their

employees and the future of the company is sometimes more important than maximizing the price they can get from a bidder (Graebner and Eisenhardt, 2004). On the other hand, managers of private firms that become targets might be more interested in cashing out and leaving the company rather than making sure it prospers after the takeover. For public companies, there are mechanisms in place through the system of governance. If they become a target, they will try to get the best price possible for their shareholders (Thomsen, 2004).

## Relatedness

"All things being equal, some product and market relatedness is better than none." As the popular belief goes, it is easy to imagine that a horizontal or vertical merger would be more preferable to the market than a conglomerate merger. Conglomerates are sold with a discount because investors are fully able to diversify on their own, and they don't see any value in a conglomerate doing it for them (Brealey, Myers and Allen, 2011). Not only that, but if the acquirer operates in the same industry as the target, it will likely have a better understanding of the target and thereby a better valuation process. Balakrishna and Koza (1993) find that industry outsiders have a greater chance of overvaluing the target. However, several studies show that relatedness does not necessarily lead to a change in abnormal returns to the bidding firm on its own (e.g. see Lubatkin, 1987; Singh and Montgomery, 1987; Barney, 1988; Capron and Pistre, 2002). Capron and Shen (2007) find that bidders prefer to acquire privately owned firms when the target is in the same industry as the bidder. When the target operates in another industry, however, the bidder usually prefers public firms. On average, they find that bidders of private firms do better than the bidders of publicly owned firms on the day of the announcement.

## Event study

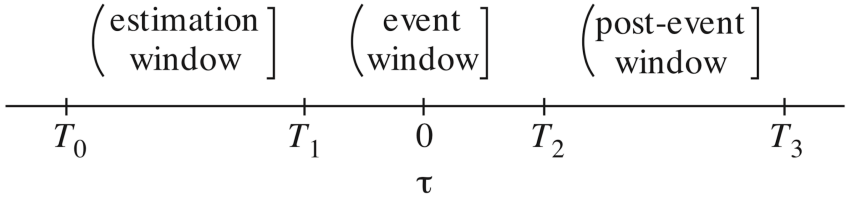
In economics and finance, the event study is a method to appraise an event's effect on the value of a company. In essence, the event study is an attempt to measure the impact of an event by estimating what would likely have happened if the event did not occur and then compare that to what actually happened. The major assumption

underlying the event study, is that the market is efficient. It follows a simple, straightforward design, which has not changed very much over time (MacKinlay (1997); Kothari and Warner, 2006). The major choices with regards to the event study methodology, is the choice of an expected returns model and the length of the estimation and event windows, as well as the selection criteria for the data sample. There are possible biases that must be addressed when outlining the model.

## Estimation and Event Windows

The estimation window is the period from which data will be drawn to estimate (i.e. predict) the normal returns in the event period. The normal returns are estimated unconditional on the event. The event window represents the time period in which the market is expected to react to the event, and the change in value of the company will reflect the reaction accordingly.

Figure 1 Event Study Timeline.




*A Typical Event Study Timeline. Adapted from MacKinlay (1997)*

The estimation window can run up until the day before the event window starts, or there might be a break between the end of the estimation window and the beginning of the event window. This can typically be due to an assumption that there has been a risk of leakage of information prior to the event. If the windows overlap or are very close to each other, and there has been information leakage or the event window is wrongly specified, a bias in the estimation parameter could likely occur. The event will in that case already have had an effect on the data in the estimation window and the normal returns will therefore be biased by the event.

Short event windows are the norm in finance today. Longer event windows introduce more noise to the event study. As long as the event date is well specified and the assumption that the market is efficient holds, there is no reason why a short event window would not be able to capture the market's reaction to the event. For estimation windows, it usually varies between 6 and 12 calendar months.

## Expected Returns Model

There are several models for defining expected returns. The Market Model is the most commonly used. For short-horizon event studies, there is little evidence of the superiority of any particular model (Kothari and Warner, 2006). Mushidzhi and Ward (2004) find no difference in results between the market model and the adjusted market model when using logarithmic returns. MacKinlay (1999) states that factor models generally offer very little improvement over the market model and that "there seems to be no good reason to use an economic model rather than a statistical model in an event study." Brown and Weinstein (1985) also find that a factor model gives limited added value compared to the market model. In a review article, Strong (1992) finds that the market model and standard parametric statistical tests appear to be a well-specified procedure if the event dates of the sample are dispersed over calendar dates. He notes that if they are not spread out over calendar time, appropriate measures should be taken.

Very few papers historically specify whether they use simple or continuously compounded returns. For some of those who use both in their paper, they note that the results were very similar regardless of return calculation (e.g. see Brown and Warner, 1985; Thompson, 1988). Thompson (1988) states that the increase in power from transforming the returns is marginal and that the form of return calculation does not seem to be an important consideration for event studies.

## Confounding Events, Leakage and Event Date Specification

Confounding events are significant events, other than the event being examined, that are also expected to have an effect on the value of the firm. If there is a confounding event at or around the event date, it will most likely camouflage the effect of the event,

which the event study is trying to capture. In most cases, it will not be possible to isolate the event being examined, and the combined effect of the confounding events is what will actually be measured.

Leakage of information prior a public announcement can pose a problem to event studies. A public announcement should in theory reach everyone at the same time, and it will therefore be possible to measure the concentrated effect of the announcement on the value of a firm over a short event window. However, any form of market reaction to a leakage prior to an announcement will likely be weaker as it may have been diffusely priced into the share over time as more and more investors learn about it. McWilliams, Segel and Teoh (1999) illustrate the effect of leakage by comparing a normal announcement to something clearly unexpected, like the crash of a commercial air plane. If something that is clearly unexpected happens, the market will react to it almost instantly and simultaneously. It will then be possible to capture the reaction of the whole market, as the value in an efficient market will adjust over a very short time frame. It is very difficult to ascertain what information the investors might have had prior to the event being examined. Specifying the event date can therefore prove to be more difficult than it would seem. Examples of typical event date specifications include the public announcement date and the date when the event is mentioned in media for the first time.

### Non-Synchronous Trading, Event Clustering and Cross-Dependency

In most empirical studies on stock returns, all the returns are usually given a common categorization like daily returns. This is what causes the non-synchronity problem or the non-trading effect. By calling all the returns daily returns or daily closing returns, an assumption that the returns are traded at the same interval is inferred (MacKinlay, 1997). For thinly traded or illiquid securities this may pose a bias, as they will in fact not be traded at the same intervals. Solibakke (2002) finds that the estimators of the parameters of the Market Model are inefficient for thinly traded securities, and that GARCH models perform better. Cowan and Sergeant (1996) also find that the traditional standardized test statistic is misspecified for thinly traded securities. For actively traded securities, however, the evidence indicates that this is not a problem. Brown and Warner (1985) states that non-synchronous trading “appears to have a detectable but limited

impact on the choice of appropriate methodology.”. MacKinlay (1997) notes that even though a bias is introduced by non-trading days, adjustments are generally not important.

Binder (1998) summarizes the findings of Cowan (1993), Karafiath and Spencer (1991), Sweeney (1991) and Salinger (1992) on the impact of bias in test statistics of hypotheses tests when abnormal estimators are correlated. He notes that when the number of observations in the event window is relatively small compared to the number of observations in the estimation window, the bias in the test statistic will be very close to the unbiased (corrected) test statistic. For event studies using daily data, the bias will therefore be negligible.

# Chapter III.

# Hypotheses

In this section we formulate three hypotheses based on the literature.

Hypothesis 1

H0: Mean abnormal return to bidder is zero

H1: Mean abnormal return to bidder is different from zero

Reasoning.

Hypothesis 2

The abnormal returns during the years around the financial crisis are different from the other years.

Reasoning

Hypothesis 3

Relatedness does not increase the abnormal returns to the bidder.

# Chapter IV.

# Methodology

In this section we describe the methodology. We explain our choice of expected returns model, estimation window and event windows.

## Research Design

We employ the event study methodology as described by MacKinlay (1997) to assess the impact of mergers and acquisitions announcements on returns to the bidding firms. Continuously compounded returns are used in our calculations.

### Expected Returns Model

Our data is not clustered at certain dates but spread around different calendar dates ranging from 2001 to 2018. There is little evidence of more sophisticated models having a superior estimation with actively traded data that is not clustered. The Market Model is therefore the chosen model for estimating expected returns in this paper. We define expected returns using the market model, as seen in equation (1).

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

We estimate the parameters of the market model using Ordinary Least Squares (OLS) regression. $E(R_{it})$ is the expected return for security i at time t. $\alpha_i$, $\beta_i$ and $\varepsilon_{it}$ are the parameters of the market model, and $R_{mt}$ is the return of the market portfolio at time t. We then subtract the expected return from the actual return, as shown in equation (2), to find the abnormal return.

$$AR_{it} = R_{it} - E(R_{it}) \quad (2)$$

$AR_{it}$ is the abnormal return for security i at time t, $R_{it}$ is the actual return for security i at time t and $E(R_{it})$ is the expected return for security i at time t. After calculating the abnormal returns, we find the cumulative abnormal returns (CAR) for the whole event window by adding up all the abnormal returns for security i from event day $t_1$ to event day $t_2$.

$$CAR_{i_{t_1,t_2}} = \sum_{t=t_1}^{t_2} AR_{it} \tag{3}$$

Finally, we calculate the cumulative average abnormal returns (CAAR) across all observations for the full sample. As seen in equation (4), we add up the CAR for every event, and then divide by the total number of observations to find the CAAR.

$$CAAR_{t_1,t_2} = \frac{1}{N} \sum_{t=t_1}^{t_2} CAR_{i_{t_1,t_2}} \tag{4}$$

For the test statistic, we employ the cross-sectional approach to measuring variance as proposed by MacKinlay (1997). Homoskedasticity is not a requirement for this estimator to be consistent, but an absence of clustering is.

$$VAR(CAAR_{t_1,t_2}) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_{i_{t_1,t_2}}^2 \tag{5}$$

Estimation Window and Event Window

We use an estimation window of 120 trading days, which on average is equal to around 6 calendar months. The estimation window begins 147 days before the event day and ends 22 trading days before the event day. We set the end of the estimation window about one calendar month before the event to reduce the chance of leakage or wrongly specified event date bias the estimator. Our main event window consists of three days [1,1]. In addition, we run a longer event window of eleven days, [5,5], so that we might be able to see if there has been a slightly delayed market reaction or if the market has anticipated the acquisition.

# Chapter V.

# Data

In this section we outline the process of data collection and preparation. We describe the sample selection criteria and possible biases that may have arisen from the collection process. Finally, we give a summary of the characteristics of the deals in the final sample.

## Data Collection

We collect data on mergers and acquisitions from Thomson Reuters SDC Platinum database. To be included in the sample, deals must satisfy the following inclusion criteria:

- The announcement date was between 01.01.2001 and 31.12.2018.
- The bidder is a Norwegian firm listed on Oslo Stock Exchange (OSE)
- Form of the deal is Merger or Tender Offer
- The deal value is disclosed

Furthermore, we reduce the sample in R to only include deals where either the shares acquired, or the sum of shares held and shares sought, exceed one third of the total outstanding common shares. This way, we are certain that the bid triggers the mandatory takeover bid rule, even if the bidder has had a toehold beforehand. In addition to that, it also excludes smaller deals where the bidder will not gain control. We collect daily adjusted close prices from Quandl and Yahoo Finance for every firm in the reduced sample. For the data to be accepted, there must be complete data for at least one month leading up to the event, and the data must be traded for at least 70% of the estimation window. We manage to find sufficient daily stock history from the start of the estimation window through the longest event window for 200 observations.

Some firms may announce a merger or acquisition at the same time as another company specific announcement. Examples of such announcements can be a major

contract announcement or an earnings announcement. Confounding events may skew the results, as we will not be able to isolate the event we are looking at. A confounding event might have a positive or negative impact on the value of the firm. The removal of confounding events may create a bias in the final sample, if there is a trend in the characteristics of mergers or acquisitions that are announced at the same time as another announcement. If some bidders systematically try to announce either perceived good or bad acquisitions at the same time as either good or bad news, our sample will be skewed in one direction. For the sample of 200 observations, we check Oslo Stock Exchange NewsWeb for any confounding events within 3 days of the M&A announcement. Another 42 observations are dropped because of confounding events close to the event date. The final sample consists of 158 observations.

We use the Oslo Stock Exchange Benchmark Index (OSEBX) as the benchmark for the market model. As we are looking at the bidders in mergers and acquisitions, the benchmark index of a representative sample of the whole exchange is deemed appropriate for the complete sample that we are investigating.

## Data Preparation

We conduct the data structuring in the programming language R. Some of the events are not announced on a trading day. For the events that are announced on a non-trading day, we move the announcement day registered in SDC forward to the first trading day after the registered announcement day.

## Sample Characteristics

The targets are spread around 34 countries, though there is only one observation in 17 of the countries. There are most domestic deals, at 61. Private firms, subsidiaries and public firms are almost equally distributed in domestic acquisitions, while there is one Joint Venture. Sweden is the most popular foreign country for the bidders in the sample, with 31 acquisitions, which of 24 are for private firms and subsidiaries in total. Of all the foreign acquisitions, the percent of which are public acquisitions stands out for Finland and U.S. at 3 of 3 and 4 of 7, respectively.

Table 5.1. Deals by Country and Target Public Status

| Country | Target Public Status | | | | |
|---|---|---|---|---|---|
| | Public | Private | Subsidiary | J.V. | Total |
| Algeria | | | 1 | | 1 |
| Australia | | 1 | 3 | | 4 |
| Bangladesh | | | | 2 | 2 |
| Bermuda | 1 | | | | 1 |
| Brazil | | 1 | 3 | 1 | 5 |
| Bulgaria | | | 1 | | 1 |
| Canada | 1 | 1 | 1 | | 3 |
| China | | | | 1 | 1 |
| Cyprus | | | 1 | | 1 |
| Denmark | | 1 | 3 | 1 | 5 |
| Finland | 3 | | | | 3 |
| France | | | 1 | | 1 |
| Germany | | 3 | | | 3 |
| Iceland | | | 2 | | 2 |
| India | | 1 | 1 | 2 | 4 |
| Lithuania | | 1 | 2 | | 3 |
| Malta | | 1 | | | 1 |
| Netherlands | 1 | 1 | | | 2 |
| New Zealand | | 1 | | | 1 |
| Norway | 19 | 22 | 19 | 1 | 61 |
| Poland | | | 1 | | 1 |
| Russian Federation | | 1 | | | 1 |
| Serbia & Montenegro | | | 1 | | 1 |
| Singapore | 2 | | | | 2 |
| Slovak Republic | | 1 | | | 1 |
| Spain | | | 1 | | 1 |
| Sweden | 7 | 12 | 12 | | 31 |
| Switzerland | | | 2 | | 2 |
| Turkey | | | | 1 | 1 |
| Ukraine | | 1 | | | 1 |
| United Arab Emirates | | | 1 | | 1 |
| United Kingdom | 1 | 1 | | | 2 |
| United States of America | 4 | 2 | 1 | | 7 |
| Yugoslavia | | 1 | | | 1 |
| Total | 39 | 53 | 57 | 9 | 158 |

There are at least two observations in every year, with the highest count being 20 in 2007 and the lowest being two in 2001 and two in 2015. As for the reported deal value, 2006 is the year with the highest total deal value. There is a distinct fall around the financial crisis in both value and number of observations in 2008, and the fall continues through 2009. 2009 is the second to lowest year by total deal value, only slightly above 2001.

Table 5.2. Deals by Year

| Year | # Observations | Total Deal Value (MUSD) | Total Deal Value (MNOK) |
|---|---|---|---|
| 2001 | 2 | 277,992 | 2457,931 |
| 2002 | 5 | 1930,398 | 15608,505 |
| 2003 | 7 | 5174,935 | 29059,956 |
| 2004 | 10 | 1679,454 | 8419,515 |
| 2005 | 13 | 6557,899 | 42586,543 |
| 2006 | 14 | 33503,074 | 207980,310 |
| 2007 | 20 | 5580,304 | 33347,249 |
| 2008 | 13 | 2910,292 | 16193,402 |
| 2009 | 6 | 281,602 | 1658,514 |
| 2010 | 16 | 6064,255 | 35222,134 |
| 2011 | 8 | 5286,334 | 29688,914 |
| 2012 | 7 | 959,776 | 5625,233 |
| 2013 | 6 | 1449,607 | 8846,769 |
| 2014 | 7 | 529,678 | 3188,075 |
| 2015 | 2 | 416,747 | 2606,536 |
| 2016 | 8 | 2632,47 | 21572,286 |
| 2017 | 6 | 2470,576 | 19878,340 |
| 2018 | 8 | 1700,506 | 14003,011 |
| Total | 158 | 79405,899 | 497943,223 |

There are at least two observations in every year, with the highest count being 20 in 2007 and the lowest being two in 2001 and two in 2015. As for the reported deal value, 2006 is the year with the highest total deal value. There is a distinct fall around the financial crisis in both value and number of observations in 2008, and the fall continues through 2009. 2009 is the second to lowest year by total deal value, only slightly above 2001.

Table 5.3. Deals by Industry

| Row Labels | # Observations | Sum of Deal Value (MUSD) | Sum of Deal Value (MNOK) |
|---|---|---|---|
| Industrials | 38 | 4497,604 | 30689,43737 |
| High Technology | 26 | 2553,392 | 15915,25729 |
| Energy and Power | 22 | 18937,809 | 121153,9604 |
| Telecommunications | 18 | 5957,437 | 37975,91763 |
| Financials | 15 | 7112,28 | 44316,98257 |
| Materials | 13 | 37442,092 | 231268,8362 |
| Media and Entertainment | 11 | 1509,646 | 7822,71217 |
| Consumer Staples | 8 | 922,31 | 5664,962769 |
| Consumer Products and Services | 4 | 95,13 | 543,2455609 |
| Healthcare | 2 | 211,918 | 1258,123 |
| Retail | 1 | 166,281 | 1333,789785 |
| Total | 158 | 79405,899 | 497943,2247 |

# Chapter VI.

# Analysis and Results

In this section we describe the analysis and the results.

## Univariate Analysis

Table 6.1. shows the cumulative average abnormal returns for the three day window and the eleven day window. The three day CAAR is positive and significant at a 10 percent level. The minimum and maximum values indicate that there are both negative and positive outliers, and they are rather extreme CAAR's for a bidder. The fact that the median is almost zero for both windows, while the CAAR's are at 1 percent, likely means that the outliers are skewing the results. For the full sample, we therefore question the real significance of the three day CAAR that is reported as significant.

Table 6.1. Results for the Full Sample

| Event Window | Estimate | Error | T value | Min | Median | Max |
|---|---|---|---|---|---|---|
| [-1,1] | 0,0102 | 0,0053 | 1,9272 | -0,3892 | -0,0001 | 0,5378 |
| [-5,5] | 0,0101 | 0,0101 | 0,9997 | -0,3795 | -0,0048 | 0,7509 |

Table 6.2. shows the CAAR of the bidders over a three day window and an eleven day window, subsampled by time period. The cumulative average abnormal returns for the full sample over the three day window are significant at the 10 percent level and positive but insignificant over the eleven day window. However, the median three day CAAR is negative although NOT? marginally different from zero. This implies that the average abnormal return of those that earn positive abnormal returns on average are more different from zero than the average abnormal return of those that earn negative abnormal returns. For the mergers and acquisitions that took place between 2007 and 2012, the abnormal returns are significant at the 1% level for both the three day window and the eleven day window. It is clear that this is unique for the time period. We find significant evidence for the hypothesis of different abnormal returns relative to the two other time periods. A possible explanation may be that firms were sold with a discount due to the financial crisis of 2008, and that only large firms were able to finance an acquisition. For our sample, the six year period between 2007 and 2012 was also the most active. There are 70 observations in the period, which is 44,3 percent of the total bids from 2001 to 2018.

Table 6.2. CAAR by Time Period (median in parentheses)

| Event Window | 2001-2006 | 2007-2012 | 2013-2018 | Full Sample |
|---|---|---|---|---|
| [-1,1] | -0,0114<br>(-0,0096)<br>N=51 | 0,0218***<br>(0,0121)<br>N=70 | 0,0179<br>(-0,0061)<br>N=37 | 0,0102*<br>(-0,0001)<br>N=158 |
| [-5,5] | -0,0261<br>(-0,0286)<br>N=51 | 0,0287***<br>(0,012)<br>N=70 | 0,0248<br>(0,0112)<br>N=37 | 0,0101<br>(-0,0048)<br>N=158 |

****, ** and * denote statistically significance at 10, 5 and 1 percent level respectively.*

Relatedness

We find no evidence of industry relatedness giving higher or lower abnormal returns for the bidding firm in the initial analysis, neither over a three day window or an eleven day window. As seen in table 6.3., unrelated deals are slightly more positive. However, none of them are significant. In addition, the median of all four are very close to zero. Most of the literature is quite conclusive on the effect of relatedness of bidder and target. Our results are consistent with the existing literature and suggest that industry relatedness does not give an increase in abnormal returns on its own.

Table 6.3. CAAR by Industry Relatedness (median in parentheses)

| Event Window | Related | Unrelated | Full Sample |
|---|---|---|---|
| [-1,1] | 0,0069<br>(-0,0038)<br>N=110 | 0,0177<br>(0,0066)<br>N=48 | 0,0102*<br>(-0,0001)<br>N=158 |
| [-5,5] | 0,0035<br>(-0,0022)<br>N=110 | 0,0251<br>(-0,0098)<br>N=48 | 0,0101<br>(-0,0048)<br>N=158 |

****, ** and * denote statistically significance at 10, 5 and 1 percent level respectively.*

For the full sample, we find that only private targets are significant and only for the three day window. The three day CAAR is 0,0235 and it is significant at the one percent level, while the median is 0,0055. Again, this is likely caused by outliers.

The abnormal returns are positive and significant at the one percent level for subsidiaries and private targets when the payment is in the form of stocks. When we look at the eleven day window relative to the three day window, both the CAAR and the median increase for the two of them. This can be due to information about non-public firms usually being less available than for public firms, both in quantity and quality. In accordance with information asymmetry theory, the market may not have enough information to assess the value of the acquisition quickly. Another explanation is that the market may not have anticipated the deals. However, the subsamples for stock payments are only 20 in total, and 4 and 8 for private firms and subsidiaries respectively. The size

of these subsamples, and the stock payment subsample as a whole, raises questions about the validity of the normality distribution assumption. We are therefore wary of emphasizing the positive effect of stock payment on bidder returns when the target is a private firm or a subsidiary. This also applies to when the payment is made in the form of cash or a combined cash and stock offer, and the target is a private or public firm. Even though a combined payment for a public firm is negative and significant at the five percent level, there are only three observations of that kind. For a combined payment when the target is a private firm, the CAAR is positive and also significant at the five percent level. Nonetheless, there are only nine observations in this subsample. As the subsamples are so small, further research is needed before any conclusion can be drawn.

Finally, we find that the three day CAAR for private firms paid in cash are significant at the ten percent level. However, when we look at the eleven day window, the positive abnormal returns turn negative and the median CAR is -0,0268, although not significant. It is difficult to explain the difference between the eleven day window and the three day window. Again, one possible explanation may be that the market is not as efficient when information about the target is missing or if it is very scarce.

Table 6.4. CAAR by Target Public Status and Consideration Structure (median in parentheses)

| | Event Window | Public | Private | Joint Ventures | Subsidiaries | Full Sample |
|---|---|---|---|---|---|---|
| Full Sample | [-1,1] | 0,0059<br>(0,002)<br>N=39 | 0,0235***<br>(0,0055)<br>N=53 | -0,0021<br>(-0,0103)<br>N=9 | 0,0026<br>(-0,0028)<br>N=57 | 0,0102*<br>(-0,0001)<br>N=158 |
| | [-5,5] | 0,0089<br>(-0,0144)<br>N=39 | 0,0132<br>(-0,015)<br>N=53 | 0,0023<br>(-0,0025)<br>N=9 | 0,0092<br>(0,0045)<br>N=57 | 0,0101<br>(-0,0048)<br>N=158 |
| Stock only | [-1,1] | 0,0126<br>(0,0074)<br>N=8 | 0,1204***<br>(-0,0049)<br>N=4 | N=0 | 0,0534***<br>(0,0167)<br>N=8 | 0,0505***<br>(0,0074)<br>N=20 |
| | [-5,5] | 0,0081<br>(-0,0398)<br>N=8 | 0,2532***<br>(0,1522)<br>N=4 | N=0 | 0,0891**<br>(0,0338)<br>N=8 | 0,0895***<br>(0,0337)<br>N=20 |
| Cash only | [-1,1] | 0,0131 | 0,0128* | -0,0121 | -0,0055 | 0,0046 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | (0,0034)<br>N=27 | (0,0023)<br>N=30 | (-0,0129)<br>N=8 | (-0,0037)<br>N=34 | (-0,0031)<br>N=99 |
| | [-5,5] | 0,0162<br>(-0,0062)<br>N=27 | -0,0153<br>(-0,0268)<br>N=30 | 0,0005<br>(-0,005)<br>N=8 | 0,0015<br>(0,0126)<br>N=34 | 0,0003<br>(-0,0062)<br>N=99 |
| Combined Payment | [-1,1] | -0,0378**<br>(-0,0287)<br>N=3 | 0,047**<br>(0,0191)<br>N=9 | N=0 | -0,0057<br>(-0,0082)<br>N=7 | 0,0142<br>(0,0064)<br>N=19 |
| | [-5,5] | -0,0417<br>(-0,0384)<br>N=3 | 0,0497<br>(0,02)<br>N=9 | N=0 | -0,0548<br>(-0,0542)<br>N=7 | -0,0033<br>(-0,0286)<br>N=19 |
| Undisclosed | [-1,1] | -0,11<br>(-0,11)<br>N=1 | -0,0043<br>(0,0018)<br>N=10 | 0,0777<br>(0,0777)<br>N=1 | -0,0064<br>(-0,001)<br>N=8 | -0,0063<br>(-0,0008)<br>N=20 |
| | [-5,5] | -0,0286<br>(-0,0286)<br>N=1 | -0,0301<br>(-0,0437)<br>N=10 | 0,0169<br>(0,0169)<br>N=1 | 0,018<br>(0,0047)<br>N=8 | -0,0084<br>(-0,0104)<br>N=20 |

****, ** and * denote statistically significance at 10, 5 and 1 percent level respectively.*

Cross-Sectional Analysis

After the univariate analysis, we conduct a cross-sectional regression. We create the following variables:

- Relative Deal Size: Deal Value in MNOK divided by the value of the bidder in MNOK. The value of the bidder is calculated by multiplying the share price one month prior to the announcement date by the common shares outstanding as reported in the annual report of the prior year.
- Relatedness: Dummy variable coded to 1 if the bidder and target operate in the same macro industry, 0 if they do not.
- Private: Dummy variable coded to 1 if the target is private and 0 if not.
- Public: Dummy variable coded to 1 if the target is public and 0 if not.
- Stock: Dummy variable coded to 1 if the payment is in the form of stock only, 0 if not.
- Cash: Dummy variable coded to 1 if the payment is in the form of cash only, 0 if not.

- 2007-2012: Dummy variable coded to 1 if the acquisition was announced between 2007 and 2012, 0 if not.
- 2013-2018: Dummy variable coded to 1 if the acquisition was announced between 2013 and 2018, 0 if not.

Based on the results from the univariate analysis, we create dummy variables for the time period of the CAR as control variables for the cross-sectional regression. The intercept in the regression output represents the average CAR over each of the windows when the other variables are set to zero (i.e. not related, relative deal size equals zero, J.V. or subsidiary, undisclosed or hybrid payment). It is significant at the 10 percent level over the eleven day period, but insignificant for the three day window. Furthermore, we find that relative deal size is statistically significant at the one percent level, though it is marginally different from zero. We would expect it to be zero, as small deals relative to the bidder do not have as much of an impact on the overall share price of the acquirer. A possible explanation is that the negotiation power is altered when the deal size increases relative to the bidder, meaning that the abnormal returns can turn to negative after a certain level.

We do not find any evidence of relatedness increasing the abnormal returns to the bidder in the cross-sectional regression either. It is slightly positive, but the t value of it is only 0,5152. The abnormal returns of bidders when the target is a private firm are negative and significant at the ten percent level. This is the opposite of the univariate analysis. We believe the cross-sectional regression to handle outliers better, and that the result here is closer to the reality.The two time period dummy variables indicate that the returns were a lot higher during 2007-2012 and 2013-2018. They are both significant at the one percent level.

For the three day window, there is only one significant variable. The abnormal returns were a lot higher during 2007-2012 over a three day window as well.

Table 6.5. Cross-Sectional Regression of the Full Sample

| Independent Variable | Dependent Variable | |
|---|---|---|
| | CAR[-5,5] | CAR[-1,1] |

| | | |
|---|---|---|
| Intercept<br>t-value | -0,03607<br>(-1,8967) | -0,009124<br>(-0,931) |
| Relative Deal Size<br>t-value | -0,0000015<br>(-3,3746) | -0,0000006<br>(-1,156) |
| Relatedness<br>t-value | 0,006716<br>(0,5152) | -0,00333<br>(-0,51) |
| Private<br>t-value | -0,02192<br>(-1,8079) | 0,003747<br>(0,577) |
| Public<br>t-value | -0,00143<br>(-0,0946) | -0,001285<br>(-0,157) |
| Cash<br>t-value | 0,009295<br>(0,76) | 0,003315<br>(0,456) |
| Stock<br>t-value | 0,13707<br>(0,4684) | -0,00126<br>(-0,096) |
| 2007-2012<br>t-value | 0,40215<br>(3,3625) | 0,01693<br>(2,341) |
| 2013-2018<br>t-value | 0,048827<br>(2,928) | 0,003<br>(0,358) |
| R-Squared | 0,1349 | 0,07574 |
| Robust residual standard error | 0,0647 | 0,0325 |

## Chapter VII.

## Conclusion and Final Remarks

We investigate the abnormal returns to bidders in 158 merger and acquisition announcements, in which the acquirer is a Norwegian firm listed on Oslo Stock Exchange. We find significant positive returns overall to the bidder over a three day window, but remark that it is likely that the significance level of 10 is caused by outliers. Furthermore, we find no evidence for relatedness leading to increased abnormal returns in any of the analyses. Both the univariate and cross-sectional regression indicate that the abnormal returns from 2007-2018 are due to external factors and economic conjunctures.

All of the findings are consistent with existing literature. There is a chance that the removal of confounding events might have created a bias in the data sample. However, as we are not able to isolate the effect of the confounding events, we find it best to exclude them from the sample.

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