Norwegian School of Economics
Bergen, Autumn, 2022

Survival of the Fittest?

An empirical analysis of spillover effects following M&A announcements in the Norwegian stock market

Emil Ingvaldsen Lyse & Sondre C. Stryken

Supervisor: Karin S. Thorburn

Master thesis in Economics and Business Administration

Major: Financial Economics

NORWEGIAN SCHOOL OF ECONOMICS

Acknowledgements

The authors of the following thesis are Emil Ingvaldsen Lyse and Sondre C. Stryken. We wrote the thesis as a part of our Master of Science in Economics and Business Administration at the Norwegian School of Economics. It was written during the autumn semester of 2022 and gave 30 ECTS. Both authors majored in Financial Economics.

We want to express our gratitude to our supervisor, Karin S. Thorburn, who has provided us with valuable guidance and constructive feedback throughout the creation of our thesis. She is also responsible for introducing us to the fascinating market for corporate control through her engaging M&A course at NHH. For that, we are grateful. We would also like to thank M&A lawyer Hans Kristian Nygaard for his guidance on the legal perspectives of Norwegian merger activity. Also, we thank our friends and family for their support during the past few months. Finally, the authors want to thank each other for a demanding yet entertaining process.

Norwegian School of Economics

Bergen, December 2022

Emil Ingvaldsen Lyse

Sondre C. Stryken

Abstract

This thesis aims to add to the difficult issue of announcement returns in rivals of acquisition targets. As existing M&A literature has predominantly focused on the acquirer, the target, and the merged entity, much remains to be known about the competitive effects of merger activity. Accordingly, our research may help challenge the widespread perception among regulators that being a merger outsider represents a competitive threat. We aim to add to the ongoing investigation of rival returns by examining announcement returns in rivals of Norwegian acquisition targets. Specifically, we investigate if several non-researched deal-specific and firm-specific variables can help explain sources of rival gains following acquisition announcements.

Using a sample of 163 acquisition announcements and 987 rival firms in Norway between 1995-2020, we find that, on average, rivals of Norwegian acquisition targets experience positive announcement returns. We hypothesize that in acquisitions where the acquirer and target are competitors, rivals will gain less than rivals where they are not. This is because horizontal transactions are more likely to negatively impact rival firms' future cash flows. Our findings confirm our hypothesis, as rivals, on average, gain less when the transaction is horizontal. Moreover, we find that rival returns increase when the acquirer is foreign and when the bid surprises the market. Both are likely due to positive signalling effects such as increased industry growth expectations or a greater probability that the rival will become a subsequent target.

Furthermore, we investigate if concerns of increased competition can explain the lower announcement returns in horizontal acquisitions. Using market share and EBITDA margin as proxies for the competitive position of rivals, we test if they impact rival returns differently in horizontal and nonhorizontal acquisitions. We find that a higher market share correlates with higher announcement returns in horizontal acquisitions but not in the total sample. This coincides with our theory that investors prefer investing in rivals with solid competitive positions following intra-industry mergers but smaller targets after nonhorizontal transactions. However, the EBITDA margin does not impact the subsamples differently. Thus, we cannot conclude that competitive concerns drive down rival returns in horizontal acquisitions. Finally, the extant literature neglects the link between rival returns and ownership structure, despite corporate finance making strong predictions between target returns and ownership structure. We aim to add to this loophole in the literature by including four proxies capturing the ownership concentration of rival firms in our analysis. However, we find no evidence that ownership structure impacts rival announcement returns.

Contents

1 Introduction 1
2 Theoretical background 5
2.1 The Signaling Hypothesis 5
2.1.1 The Acquisition Probability Hypothesis 6
2.1.2 The Industry Growth Hypothesis 7
2.2 The Market Power Hypothesis 7
2.3 The Competitive Advantage Hypothesis 8
2.4 The Hubris Hypothesis: 8
2.5 Section Summary 9
3 Literature Review 10
3.1 Synthesis of empirical evidence on rival gains 10
3.2 Variables Used to predict takeover probability 12
3.3 The Role of Ownership on takeover likelihood 13
3.4 Section Summary 14
4 Hypotheses 15
4.1 Hypothesis 1 – The Nature of the Bid 15
4.2 Hypothesis 2 – Predicted Competitive Pressures 17
4.3 Hypothesis 3 - Ownership Structure 19
5 Data 21
5.1 Data Sources & Cleaning 21
5.1.1 SDC-Platinum: Transaction Overview and Characteristics 21
5.1.2 Refinitiv Eikon: Industry Classification Codes 22
5.1.3 Børsdatabasen: Stock Prices and Stock Market Index 23
5.1.4 Regnskapsdatabasen: Accounting and Ownership Variables 24
5.2 Variables 24
5.2.1 Variables used in the deal-specific regression analysis 24
5.2.2 Variables used in the firm-specific analysis 27
5.3 Descriptive Statistics 33
5.3.1 Deal-Specific Variables 33
5.3.2 Firm-Specific Variables 34
5.3.3 Deal Distribution 35
6 Methodology 35
6.1 Event Studies 36

6.1.1 Introduction to Event Studies ... 36
6.1.2 Structuring an Event Study ... 38
6.1.3 Estimating Normal Performance ... 39
6.1.4 Aggregating Abnormal Returns ... 40
6.2 Cross-Sectional analysis ... 41
7 Analysis ... 42
7.1 Abnormal Returns Across Portfolios ... 43
7.1.1 Key Explanatory Variables ... 46
7.1.2 Other control variables of Interest ... 47
7.1.3 Summary of Portfolio Findings ... 49
7.2 Cross-Sectional Analysis of Rival Returns ... 49
7.2.1 Key Explanatory Variables ... 51
7.2.3 Summary of Individual Findings ... 54
8 Robustness ... 56
8.1 Change of Normal Performance Model ... 56
8.2 Exclusion of Periods of Financial Turbulence ... 56
8.3 Adjustments for Multicollinearity, Heteroscedasticity, and Autocorrelation ... 57
8.3.1 Multicollinearity ... 57
8.3.2 Heteroskedasticity and Correlation of the Error Term ... 57
8.4 Misspecification and Omitted Variable Bias ... 58
9. Conclusion ... 58
Appendix ... 62
Bibliography ... 70

List of Tables

Table 2.1 Hypothesis Overview 10
Table 5.1 Descriptive Statistics – Deal and Industry-Specific Characteristics 33
Table 5.2 Descriptive Statistics – Firm-Specific Characteristics 34
Table 5.3 Deal Distribution 35
Table 7.1 T-test for Statistical Significance of CAAR 43
Table 7.2 T-test for Statistically Significant Difference in Means 44
Table 7.3 Regression Models – Deal-Specific Variables 45
Table 7.4 Regression Models - Firm-Specific Variables 51
Table A1.1 Hypotheses Literature Overview 62
Table A2.1 Full OLS Regression specifications and results of models presented in Table 7.4 ... 63
Table A3.1 Regression models – Deal Specific Variables With CAR Obtained Using Market Adjusted Model 64
Table A3.2 Regression Models - Firm-Specific Variables With CAR Obtained Using Market-Adjusted Model 65
Table A3.3 Regression Models – Deal-Specific Variables Excluding 2008 Financial Crisis and 2014 Oil Crash 66
Table A3.4 Regression Models - Firm-Specific Variables Excluding 2008 Financial Crisis and 2014 Oil Crash 67
Table A3.5 Variance Inflation Factors for Regression Models – Deal-Specific Variables 68
Table A3.6 Variance Inflation Factors for Regression Models - Firm-Specific Variables 68
Table A3.7 Ramsey RESET Test P-values of Regression Models With Deal-Specific Variables 69
Table A3.8 Ramsey RESET Test P-values of Regression Models With Firm-Specific Variables 69

1 Introduction

In the spirit of the efficient market hypothesis (EMH), new and relevant information will cause investors to reassess future expected cash flows (Yen & Lee, 2008). Relevant information includes changes in the competitive environment, future growth prospects, or the perceived probability of the firm engaging in M&A activity (Khan et al., 2017). Furthermore, merger activities can dramatically impact the target's and its rival's stock prices, as synergies related to revenue growth, cost efficiencies, or financial structures may change the competitive positioning of market participants. Additionally, merger activity may affect productivity indirectly through a firm's incentives to enter or exit the industry (Dimopoulos & Sacchetto, 2016). Given the above, there should be no surprise that substantial evidence exists that mergers significantly impact the market valuation of rivals of merging firms (Eckbo, 2009).

Much, however, remains to be known about how takeovers affect a firm's rivals in general (Davis et al., 2021). Research on M&A has focused predominantly on acquiring firms, their targets, and the merged entity (King et al., 2004). Thus, existing literature fails to address how acquisitions create market opportunities for and change the competitive position of non-merging rival firms. A common and logical perception is that being an outsider of a merger represents a competitive threat. Merger activity is conditioned on value creation and would accordingly strengthen the position of the merged entity. Surprisingly, however, researchers are consistent in their findings that rivals of M&A targets, on average, experience positive abnormal returns following acquisition announcements.

Background and Motivation

M&A scholars have proposed different theories on why rivals of target firms experience positive returns following merger announcements (Davis et al. 2021). Among those most thoroughly researched is the acquisition probability hypothesis. This hypothesis argues that competitors experience positive gains because investors change their perceived probability that the rival will become a subsequent target (Walkling & Song, 2000). Though receiving significant support in the literature, finding evidence for the acquisition probability hypothesis does not contribute to understanding the merger's competitive implications. That is, the hypothesis fails to address the impact the acquisition will have on the future cash flows of the rivals of the M&A target.

Interestingly, the extant literature sometimes finds that target rivals in horizontal acquisitions experience lower abnormal returns than nonhorizontal ones. In other words, when the acquirer

and target operate in the same industry, rivals gain less than when the merging firms are unrelated or in different parts of the value chain. To our surprise, the extant literature does not thoroughly investigate why this difference exists. In our view, fears that the horizontal merger will hurt the competitive positioning of the rivals likely result in lower returns in horizontal acquisitions. Although a nonhorizontal transaction may also hurt competitors, disturbances in the competitive environment are more likely to occur following a horizontal transaction. Finding evidence that competitive concerns drive down rival returns in horizontal acquisitions will help to shift the current focus from acquisition probability to cash flow effects – and thus – provide a more nuanced view on sources to rival gains. We are consequently motivated to discover if variables associated with competitive resilience have explanatory power on rival returns in horizontal and nonhorizontal transactions.

Furthermore, there is still limited explanation for the wide cross-sectional variation in rival returns (Haleblian, 2009). Research performed by Walkling & Song (2000) found that only 50-60% of rivals of M&A targets earn positive abnormal returns. Typically, researchers make arguments related to size, leverage, liquidity, and valuation to explain variations in target rival returns. For example, increased size is associated with lower takeover probability, meaning larger rivals experience lower announcement returns. Also, low leverage could mean the rival has unused debt capacity, making them a more likely future acquisition target. Everything else equal, this should result in higher announcement returns.

We notice that variables capturing ownership structure are rarely used as explanatory factors to explain cross-sectional rival returns. We find this surprising as one can make several theoretical arguments for why it may affect investor decisions to acquire or sell rival shares following merger announcements. For example, firms characterized by fragmented ownership structures can be harder to acquire because individual shareholders are better of by not tendering their shares. Thus, investors may consider takeover likelihood lower, and consequently, these rivals may experience lower announcement returns. Also, ownership structure may impact rivals' future ability to generate cash flow. For example, if the merger produces significant industrial disruptions, shareholder activism can be necessary to enforce a corporate response from management. Because large shareholders can more easily carry out activism, a blockholder may positively impact rival returns. As the extant literature does not focus on this dynamic, we are motivated to investigate if ownership variables can explain the cross-sectional dispersion in rival announcement returns.

Procedure and Findings

First, we perform an event study on target rival returns following acquisition announcements. We capture the acquisition announcement's effect on rival firms' stock prices through the event-study methodology. Initially, we obtain one return observation per rival. However, rival returns are measured simultaneously within the same industry, so they are not independent. Consequently, when investigating the overall industry implications of the merger, we aggregate rival announcement returns into portfolios. Therefore, we obtain one rival portfolio observation per acquisition announcement. Testing their significance, we find that, on average, rivals of Norwegian acquisition targets experience positive abnormal returns following the acquisition announcement. Our findings are consistent with prior findings, primarily from North American equity markets, although we study a market with different characteristics[1].

Next, we categorize our sample into horizontal and nonhorizontal transactions. We perform a univariate analysis and find that portfolios of non-horizontal rivals, on average, experience statistically significant positive abnormal returns, while horizontal do not. However, a t-test for differences in means fails to prove a statistically significant difference in returns between the two groups.

Because the univariate test lacks power, we perform two regression analyses. In the first analysis, we use the rival portfolios' cumulative abnormal return (CAR) as the dependent variable and control for deal-specific variables (e.g., deal size) that may explain rival returns. Our findings suggest that nonhorizontal acquisitions, on average, yield greater rival gains than horizontal ones. The results follow our conjecture that horizontal mergers may harm rivals' future ability to generate cash flow, causing lower announcement returns. Furthermore, we find evidence that surprising acquisitions positively impact the rival announcement returns. Our interpretation is that the unexpected mergers yield a more significant information effect, causing investors to reassess the probability that the rivals will become subsequent targets or benefit from industry growth. Finally, a foreign acquirer seemingly impacts rival returns positively. The reason may be that international attention is associated with a stronger positive signalling effect. However, this effect does not persist when excluding periods of financial turbulence. This may imply that foreign acquirers only impact rival returns when markets are nervous and volatile.

[1] Extensive literature finds geographical differences in characteristics of equity markets. For example, Edmans & Holderness (2009) point out that European equity markets generally have more concentrated ownership structures.

In the second regression analysis, we use each individual rival's cumulative abnormal return (CAR) as the dependent variable and primarily control for firm-specific variables (e.g., size). We find that, on average, the rival's market share does not have explanatory power on announcement returns. However, market share becomes statistically significant when interacting the variable with a dummy variable for horizontal acquisitions. These findings are consistent with our expectation that competitive concerns negatively affect horizontal announcement returns, as investors seemingly prefer rivals with solid competitive positions. As a second proxy for the competitive position of the rival, we include the EBITDA margin as an explanatory variable. Because the extant literature usually finds that poor operational performance is associated with a higher probability of becoming a target, we expected the coefficient to be negative. However, we find that firms with higher EBITDA margins experience higher announcement returns, implying that investors believe acquirers prefer firms with solid operational performance. Also, surprisingly, the interaction term between the EBITDA margin and the horizontal dummy is insignificant. This contradicts our expectation that investors prefer rivals with solid operational performance following intra-industry mergers.

Finally, we investigate the role of ownership structure on rival returns by including four variables capturing ownership concentration. Because the extant literature finds that higher ownership concentration is associated with a higher likelihood of becoming a target, we expect rivals to gain from concentrated ownership. However, we find no evidence that such a relationship exists. Surprisingly, the existence of a blockholder owning at least 33% of the outstanding shares does not impact rival returns. Because owners beyond this threshold are more likely to fit into categories that are more reluctant to sell shares (e.g., families, parent companies, or the government), one may argue that rivals should experience lower announcement returns. However, we find no evidence of this relationship or any other connections between rivals' ownership structure and their announcement returns.

Contributions and Structure

Our research makes three contributions to the literature on M&A. First; we help shift the current focus in M&A from acquirers, targets, and merged entities to rival firms. The shift is essential as focusing solely on merger insiders does not contribute to finding appropriate answers to whether M&A benefits or harms different industry groups (Chatterjee, 1986). Secondly, by investigating differences between horizontal and non-horizontal transactions, we add to the understanding of

sources of rival gains and the competitive implications of merger activity. Specifically, we analyze whether cash flow concerns are weighed more in horizontal than non-horizontal transactions. Finally, we contribute to an increased understanding of the cross-sectional dispersion by discovering the role of ownership structure in an investor's decision to acquire or sell rival shares following the acquisition announcement.

We structure our thesis as follows: In section 2, we present theories developed on why rivals gain following acquisition announcements. Next, in section 3, we synthesize the empirical research on the theories and review other literature relevant to our thesis. In section 4, we develop three hypotheses on sources to rival gains and discuss their testable implications. In section 5, we cover our data processing, motivate the inclusion of relevant variables, and provide descriptive statistics of our sample. In section 6, we introduce the methodological frameworks used in our analysis and measures taken to satisfy their validity requirements. In section 7, we present our results and discuss key variables and significant control variables. In section 8, we briefly cover the robustness of our results. Finally, in section 9, we summarise our findings and conclude the thesis.

2 Theoretical background

One can divide the most prevailing theories on rival gains into four hypotheses: (1) The Signaling Hypothesis, (2) The Market Power Hypothesis, (3) The Competitive Advantage Hypothesis, and (4) The Hubris Hypothesis. In the following section, we explain the theoretical rationale behind these predominant theories. We pay particular attention to the theories that enjoy the most significant empirical support in the extant literature.

2.1 The Signaling Hypothesis

The Signaling Hypothesis is a collective term for hypotheses that argue that an acquisition announcement (or termination) provides information about future market developments or events. The signals will differ depending on the underlying motivations of the acquisition (Gaur et al., 2009). For example, an acquisition of a semiconductor manufacturer may signal resource scarcity, resulting in increased takeover likelihood for its rivals. Differently, a financial investor acquiring a majority stake in a shipping company can signal an expectation of increased day rates, implying increased cash flows for the target and its competitors. One can roughly categorize the signaling hypothesis into two variants:

2.1.1 The Acquisition Probability Hypothesis

The Acquisition Probability Hypothesis (APH) asserts that rivals of initial industry targets experience abnormal returns following the acquisition announcement because investors update the probability that they will become targets themselves (Walkling & Song, 2000). In other words, although the firm's ability to generate cash flow remains unchanged, investors speculate that rival firms will become future targets.

According to the APH, the appearance of a bidder willing to pay a premium above the market price is the first indication of valuation differences of at least one firm in that industry. Suppose one views the value of a firm as the weighted average of its ability to generate current and future cash flow under alternative management. In that case, the market value will always reflect the acquisition probability. Following this logic, a firm considered a potential acquisition target has a greater proportion of its value under alternative management reflected in its stock price. Because M&A activity is conditional on value creation (or protection), a change in the probability of becoming a target should cause the stock price to move.

The above has an important implication. Unexpected acquisition attempts surprise the market, causing more significant abnormal returns in rivals, as little of the current stock price reflects potential acquisition attempts (Walkling & Song, 2000). Consequently, an important testable implication of the acquisition probability hypothesis is that abnormal returns in rivals increase in magnitude if the acquisition attempt surprises the market.

The hypothesis also has other important testable implications identified by Walkling & Song (2000). First, rivals of the target should earn abnormal returns regardless of the transaction being horizontal or nonhorizontal opposed to theories covered later in this section. The reason is that the probability of becoming a subsequent target is unrelated to the nature of the bid. Secondly, those rivals that enjoy significant abnormal returns should possess firm characteristics associated with a higher probability of becoming a target. Examples include low managerial ownership, large debt capacity and low sales growth (Palepu, 1986).

Although the APH predicts positive rival returns because of increased acquisition probability, the merger may also decrease the likelihood that rivals become future targets. For example, Fridolfsson & Stennek (2005) suggest that rivals may experience negative abnormal returns because a successful merger eliminates the rival as a potential merger partner. In other words,

the allocated probability of becoming a subsequent target decreases. This phenomenon is more likely in industries with fewer potential acquirers and rivals sharing similar characteristics.

If the transaction is terminated (for firm-specific, merger-specific, or industry-specific reasons), the APH provides no definite answer on rival gains. For example, rivals could experience positive abnormal returns because a termination increases the probability that the original acquirer will pursue them instead (Akhigbe et al., 2000). Alternatively, industry-specific factors causing termination (such as antitrust laws) could have the opposite effect as they signal that approval of similar acquisitions is less likely.

2.1.2 The Industry Growth Hypothesis

The industry growth hypothesis (IGH) presented by Gaur et al. (2013) contends that an acquisition announcement conveys new information about the potential for future industry growth. Gaur et al. (2013) claim that the acquisition announcement primarily signals increased growth potential in the *acquirer's* industry, causing investors to buy shares in rivals of the bidder. For example, suppose an oil & gas (O&G) operator such as Equinor acquires an oil-services company such as Borr Drilling. In that case, the acquisition announcement should positively affect the market value of other O&G operators (e.g., Aker BP) as it conveys expectations of future growth in the O&G market. Following this argument, in *horizontal acquisitions*, the target's rivals also gain because the acquirer and target operate in the same industry.

Furthermore, Walking & Song (2000) point out that initial acquisitions may also have positive industry signal effects for target rivals in *nonhorizontal acquisitions*. The reason is that acquisition attempts may reveal information about the value of the resources controlled by the target's competitors (Betton et al., 2008). For example, the acquisition of a shipping company provides new data points on ship values, regardless of the nature of the bid (horizontal vs. nonhorizontal). In summary, the industry growth hypothesis can be considered a collective term for signals unrelated to acquisition probability but related to the likelihood of increased future cash flow in rival firms.

2.2 The Market Power Hypothesis

The market power hypothesis (MPH) predicts that target rivals experience positive abnormal returns because the horizontal M&As result in reduced competition and consequently facilitate collusion among the remaining firms in the industry (Eckbo, 1983). More concentrated

industries enjoy milder competitive environments, allowing remaining market participants to collude directly or indirectly. Successful collusion will increase market power for the acquirer, target, and the remaining rivals in the industry (Clougherty & Duso, 2009).

According to Eckbo (1983), successful direct collusion can involve limiting output (e.g., OPEC+) or increasing product prices. Doing both is also an option. Furthermore, manufacturers may collude in the procurement process, disrupting the bargaining power of suppliers. Because direct collusion (agreements eliminating competition) is regulated by antitrust law in most legal environments, tacit collusion may be a more realistic externality of the merger. Rivals not involved in the collusion yield higher profit margins because they are "free riders" reaping the benefits of a friendlier competitive environment (Clougherty & Duso, 2009). An important implication of the market power hypothesis is that only horizontal acquisitions result in positive rival gains. This is because nonhorizontal transactions would not allow for added collusion, as the number of competitors remains the same. The requirement for the transaction to be successful follows the same argument. Therefore, according to the market power hypothesis, a termination announcement should result in negative abnormal returns in rivals of the target.

2.3 The Competitive Advantage Hypothesis

The competitive advantage hypothesis claims that the merging firms combined will enjoy positive abnormal returns while rivals experience negative abnormal returns. The reason is that combining the productive assets of the two firms can produce a competitive advantage, coherently putting rivals at a competitive disadvantage (Akhigbe et al., 2000). Therefore, rival firms, particularly in horizontal acquisitions, should experience negative announcement returns. Those firms that cannot adopt synergies, such as cost-efficient innovations, will experience the most significant negative returns (Chatterjee, 1986). If the merger is terminated, rivals enjoy positive abnormal returns and the parties involved in the transaction experience negative returns. An important implication is that negative rival gains following the acquisition announcement should be offset by positive gains if the merger is terminated.

2.4 The Hubris Hypothesis:

The extant M&A activity has thoroughly investigated bidding behaviour. A well-known relationship is that the abnormal stock returns of the bidder are typically small and often negative around the acquisition announcement (Eckbo E. , 2009). Roll (1986) states that overconfidence

(hubris) among the bidders could explain poor acquirer returns. Emotions or incomplete information in the assessment of synergies produce a "winners curse", where overbidding results in value-destroying M&A activity.

The above will, according to the hubris hypothesis, have implications for rivals of the firms involved in the value-reducing merger. Because firms often participate in value-destroying M&A activity, it creates opportunities for rival firms. The careful reader will note that the hubris hypothesis follows a perfectly inverse predicted pattern of the competitive advantage hypothesis. Because the merger destroys value, it changes the competitive dynamics allowing competitors to capture market shares. Thus, rivals yield positive abnormal returns at the time of the acquisition announcement. If the transaction is terminated, the target should obtain positive announcement returns while rivals experience negative returns.

2.5 Section Summary

M&A researchers have developed multiple hypotheses to explain the returns of rival firms following acquisition announcements. This section aims to explain the theoretical rationale behind them. We divide the signaling hypothesis into two sub-categories: the acquisition probability hypothesis and the industry growth hypothesis. The APH suggests that target rivals experience returns because investors reassess the probability that they will become targets themselves. The industry growth hypothesis emphasizes that M&A activity causes investors to reassess rival firms' future expected cash flows.

Furthermore, the Market Power Hypothesis proposes that horizontal M&A causes less competition and facilitates collusion that benefits the industry. As a result, the equity markets reassess cash flow projections, and investors acquire rival shares. Next, the Competitive Advantage Hypothesis predicts negative rival returns because the merged entity gains a competitive advantage over merger outsiders. Finally, the Hubris Hypothesis claims that rivals experience positive returns because investors perceive the merger as value-destroying, thus creating opportunities for rival firms. We emphasize that the theories are non-mutually exclusive despite being presented as four distinct hypotheses. In other words, the origin of rival returns is likely to be a synthesis of compatible and conflicting forces influencing stock prices. Figure 1 provides an overview of each hypothesis's predicted stock price reaction and a short rationale.

Table 2.1 Hypothesis Overview

Hypothesis	Predicted reaction	Rationale
Signalling 1: The Acquistion Probability Hypothesis	(+)	Acquisition announcements change the perceived probability that rivals will become targets themselves. Most often, the perceived probability increases, but it can decrease.
Signalling 2: The Industry Growth Hypothesis	(+)	Acquisition announcements reveal positive signals about an industry. Examples include higher demand for services or increased asset values.
The Market Power Hypothesis	(+)	Horizontal transactions facilitate successful collusion among rival firms. The effect will be positive for both rivals within the collusive agreement and those outside it. The latter figure as "free-riders" reaping the same benefits as insiders.
The Competetive Advantage Hypothesis	(-)	Synergies arising from M&A activity will produce competitive advantages and put rivals at a competitive disadvantage.
The Hubris Hypothesis	(+)	Extensive literature points to M&A activity as value destroying. Accordingly, it puts the involved parties at a competitive disadvantage and creates opportunities for rival firms.

3 Literature Review

The objective of this section is to synthesize earlier empirical research that is relevant to our thesis. We begin by synthesizing the evidence for and against the hypotheses presented in the previous section. Next, because the acquisition probability hypothesis receives significant support, we review empirical research on takeover probability. Finally, we cover the extant literature on ownership structure's impact on acquisition probability and firms' future ability to generate cash flow.

3.1 Synthesis of empirical evidence on rival gains

Scholars first found interest in abnormal returns in rivals of acquisition targets around 1980. Eckbo (1983) tests the market power hypothesis, which states that mergers result in rival gains due to successful collusion. Testing a sample of horizontal rivals of 259 US mining & manufacturing companies, he finds positive rival returns following both the *acquisition announcement* and *termination*. This contradicts the prediction of the MPH, which claims that one should observe negative returns if the deal is terminated. Akhigbe et al. (2000) specifically focus on terminated merger proposals. Like Eckbo (1983), they observe positive rival returns following merger terminations, contradicting the MPH.

Walkling and Song (2000) develop and test the acquisition probability hypothesis on a sample of 141 US initial industry targets (IIT) between 1982-1991. Interestingly, they find that nonhorizontal mergers, on average, yield positive abnormal returns while horizontal do not. Similarly, Davis et al. (2021) only observe significant positive announcement returns in nonhorizontal acquisitions. This relationship is the opposite of what the market power hypothesis predicts. As a reminder, according to the MPH, only horizontal acquisitions should

yield rival gains. Walkling & Song (2000), Akhigbe et al. (2000), and Becker et al. (2012) all report positive announcement returns in rivals following nonhorizontal acquisitions, concluding that successful collusion does not drive rival returns.

Although some empirical evidence (e.g. Akhavein et al. (1997)) supports the MPH, scholars generally reject it. As communicated above, there are two main reasons for it. First, the extant literature suggests that rivals, on average, also gain following termination announcements. Secondly, researchers usually identify positive returns in horizontal *and* nonhorizontal acquisitions and sometimes only in nonhorizontal acquisitions.

The acquisition probability hypothesis enjoys the broadest acceptance in the extant literature. Walkling & Song (2000) find that rivals that become subsequent targets within one year obtain significantly higher returns than non-targeted rivals. Furthermore, they find that cross-sectional variation systematically correlates with variables associated with a higher probability of becoming a target (Walkling & Song, 2000). Their hypothesis is supported by Akhigbe et al. (2000), who claim that the positive termination gains in rivals likely arise from an increased probability of becoming a target themselves.

Moreover, Davis et al. (2021) find that positive rival returns are a significant positive predictor of engaging in future M&A activity. Becker et al. (2008) add to the literature by examining rival gains in the electric and gas utility sector, which is typically excluded in the M&A literature. The results from their sample of 384 utility mergers between 1980-2004 are consistent with the APH as future targets gain significantly higher returns than non-targets. Finally, Otchere & Ip (2005) add to previous work by examining cross-border transactions' effect on the target's rivals. Their results are consistent with the signalling hypothesis, as they find positive announcement and termination returns. Interestingly, rival returns are higher following termination in their sample than in the initial acquisition attempt, favouring the APH over the industry growth hypothesis.

Despite the acquisition probability hypothesis enjoying broad acceptance in literature, it does not always receive support (Davis et al., 2021). For example, Clougherty and Duso (2009) find that rivals' abnormal returns are insensitive to merger waves when investigating 165 horizontal M&A transactions between 1990-2002. Their results contradict the APH, which predicts higher abnormal returns earlier in the wave because of more significant information effects. Furthermore, according to Gaur et al. (2013), the APH implies that in horizontal acquisitions,

the rivals of the *acquiring* firms would benefit more than in non-horizontal acquisitions. This is because the rivals of the target firm and acquiring firm are the same in horizontal acquisitions. However, they find no significant differences in announcement returns between horizontal and non-horizontal acquisitions for acquirer rivals. As a result, they reject the APH.

Most research on target rival announcement returns reports positive stock market reactions. Because the competitive advantage hypothesis predicts negative rival returns, it is generally rejected. For example, Akhigbe et al. (2000) rule out the competitive advantage hypothesis due to both targets and rivals gaining from the merger announcement. Moreover, Becker et al. (2021) find a positive correlation between horizontal acquisitions and rival gains, the opposite of what one expects from the competitive advantage hypothesis. However, the hypothesis also receives some support. For example, Chatterjee (1986) claims that the wealth gain observed in the target firms has to be at the expense of their horizontal rivals. Moreover, Akhigbe et al. (2000) report that on the termination date, rivals in horizontal acquisitions gain significantly higher returns than non-horizontal rivals. Overall, the extant literature is divergent in assessing the extent investors consider mergers to place rivals at a competitive disadvantage. Also, it pays little attention to the dynamic between horizontal and nonhorizontal acquisitions.

Finally, the extant literature generally rejects the hubris hypothesis. If the hubris hypothesis holds, rivals should experience negative returns when the net announcement return of the merged entity is positive. However, Gaur et al. (2013) find that rivals experience greater abnormal returns when acquiring firms experience positive returns. Moreover, Becker et al. (2008) point out that the hypothesis predicts a non-positive change for the combined entity following the merger announcement. Because they find positive combined returns in bidder and target, they rule out managerial hubris as a reason for rival gains. Appendix 1 summarizes empirical evidence on the theories outlined above.

3.2 Variables Used to predict takeover probability

Because the acquisition probability hypothesis enjoys broad acceptance, our model specification must include variables associated with takeover likelihood to control for omitted variable bias. Observing their significance will also help us assess the relevance of the acquisition probability hypothesis in explaining rival gains in Norwegian target rivals. Therefore, we briefly review the predominant literature on the variables associated with takeover probability.

Walking & Song (2000) primarily base their model specifications on Palepu's (1986) findings. Palepu (1986) designed a model to predict future takeover targets based on six hypotheses relating to acquisition probability. In his model, he included variables capturing (1) size, (2) leverage, (3) liquidity, and (4) valuation to assess their effect on takeover probability. His findings suggest that smaller size, more significant inefficiencies, lower growth, and lower leverage increase acquisition likelihood (Palepu, 1986). In particular, the effect of size is well-documented in the literature, with Ambrose & Megginson (1992) and Muller & Vitkova (2016) observing the same relationship. Also, in a survey covering empirical literature on takeover bids for US targets, Betton et al. (2008) point out that firm size consistently predicts targets across empirical studies.

Later models, like the one developed by Brar et al. (2009), include a wide range of variables that enjoy sound theoretical anchoring (e.g., profit margin). However, the results from empirical testing are mixed. For example, they fail to find evidence for their hypothesis that financially distressed companies are more likely targets. Myrholt & Khan (2018) perform a logistic analysis on 153 Norwegian public targets from 1995-2012 to identify variables associated with an increased takeover likelihood. Similar to Palepu (1986), they find that variables capturing the effect of size, leverage, liquidity, and valuation are significant predictors of future acquisition targets. For example, they find evidence that low liquidity and valuations are associated with increased acquisition likelihood. Overall, the literature on variables capturing takeover probability is mixed. However, because Myrholt & Khan's (2018) sample is relatively similar to ours, we find it plausible to partly base our model specification on their findings to capture the effect of acquisition probability.

3.3 The Role of Ownership on takeover likelihood

Grossman and Hart (1980) introduced the free-rider proposition, which states that fragmented shareholder structures decrease the likelihood of a successful transaction. Their rationale is that smaller shareholders deem their decision to tender shares irrelevant to whether the transaction is successful. Consequently, they have little incentive to accept the tender offer when trying to obtain the best possible price. Oppositely, greater concentration is associated with successful acquisition attempts (Shleifer & Vishny, 1986). Unlike minority shareholders, principal shareholders are aware of their influence on the deal outcome. Bru-Lien & Vugdalic (2017) perform an empirical analysis of 1493 public-to-public takeover bids between 2008-2014, finding that transfer of control, on average, is more challenging when the target has a fragmented ownership structure. If the acquisition probability hypothesis holds, the above implies that rivals

with fragmented ownership structures should experience lower gains because they are harder to acquire.

Also, some evidence exists that the existence of a blockholder may impact takeover likelihood negatively. For example, Nogueira & Castro (2020) find that firms where a family or the state has a majority controlling shareholding, are less likely to engage in M&A as controlling shareholders are reluctant to lose control. Moreover, Shleifer and Vishny (1986) argue that the existence of a significant blockholder results in better governance. Because the market for corporate control has a disciplinary function on management, firms with a shareholder holding majority control are less likely to engage in M&A. Furthermore, Jiang et al. (2015) find that activist hedge funds tend to block deals with low announcement returns. Thus, rivals partly owned by active hedge funds can be considered less likely acquisition targets. In addition, Holderness and Sheehan (1988) show that firms with an individual majority shareholder are less likely to partake in M&A.

However, Ambrose and Megginson (1992) find that the absolute level of institutional shareholders does not significantly influence the probability of receiving a takeover bid. Moreover, in an attempt to identify variables that affect takeover likelihood, Myrholt & Khan (2018) find little evidence for the relevance of ownership structure when using a sample of 153 publicly listed Norwegian targets between 1994-2012. In short, it remains unclear whether the existence of a blockholder affects takeover likelihood. The reason is likely to be because blockholders are heterogenous (e.g. institutions, corporations, individuals), meaning they have different motives (Edmans & Holderness, 2017). For example, the motivation behind the Norwegian government's negative control of Norway's largest bank, DNB, is maintaining domestic control. Differently, an institutional shareholder such as a pension fund is motivated by acceptable investment returns.

3.4 Section Summary

The extant literature is consistent in finding positive rival gains following acquisition announcements. However, the source of these gains remains debatable, with most attention allocated to the acquisition probability hypothesis and the market power hypothesis. The market power hypothesis is generally rejected, while the acquisition probability hypothesis receives significant support. Furthermore, the competitive advantage, the industry growth hypotheses, and the hubris hypothesis receive significantly less attention but are generally rejected.

Nevertheless, researchers sometimes find that nonhorizontal acquisitions yield greater announcement returns than horizontal ones.
Moreover, it remains unclear if there exist specific variables (apart from size) that are consistently associated with an increased likelihood of becoming a target. However, an empirical analysis of takeover likelihood from Norway shows that more diminutive size, lower valuation, and poor liquidity have historically been associated with higher takeover probability.

Finally, the extant literature finds that higher ownership concentration is typically associated with higher takeover likelihood. Also, some evidence exists that blockholders generally negatively impact the possibility of engaging in M&A. However, general conclusions are hard to draw as blockholders likely have different motives behind their ownership.

4 Hypotheses

In the following section, we develop three hypotheses related to rival returns following acquisition announcements. First, we focus on the nature of the bid, adding to the limited research on the competitive advantage hypothesis. Next, in our second hypothesis, we develop a testable implication of the competitive advantage hypothesis not yet explored in the extant literature. Finally, to our knowledge, limited research on rival returns includes ownership variables when investigating their origin. Therefore, we have hypothesised how ownership structure likely impacts rivals following acquisition announcements.

4.1 Hypothesis 1 – The Nature of the Bid

Our first hypothesis covers the nature of the bid, exploring whether there is a difference in the investor reaction to horizontal and non-horizontal acquisitions. Based on the extant literature, we formulate the following hypothesis regarding the nature of the bid:

H1_0: Rivals of targets involved in horizontal M&A activity, on average, ***experience similar*** *returns as target rivals in nonhorizontal transactions.*

H1_1: Rivals of targets involved in horizontal M&A activity, on average, ***experience*** *lower abnormal returns than rivals in nonhorizontal transactions.*

As described above, we hypothesize that horizontal mergers, on average, will yield lower returns for rival firms. Consistent with the competitive advantage hypothesis, we argue that horizontal

mergers are more likely to harm rival cash flows than nonhorizontal ones. We acknowledge that rivals in horizontal acquisitions will also benefit from an increased likelihood of being targeted or positive adjustments in industry growth/asset values. However, we find it likely that, on average, investor concerns that the merged entity will hurt the rivals' competitive position of the rival will partly neutralize gains from increased takeover likelihood or expectations of industry growth. Thus, rivals in horizontal acquisitions should experience lower announcement returns.

Traditionally, scholars have divided M&A synergies into three broad categories: (1) market power synergies, (2) operational synergies and (3) financial synergies (Chatterjee, 1986). First, market power synergies will allow the merged entity to sell its product/services at higher prices or increased volumes. This may hurt competitors' market shares. Next, operational synergies decrease operational costs, thus enabling the merged entity to sell the product/service at a lower price than its rivals. If rivals cannot adopt the efficiency gains without engaging in merger activity themselves, they will not be cost-competitive. Finally, financial synergies lower the merged entity's cost of capital, providing greater financial flexibility and lower financing costs.

In theory, both horizontal and nonhorizontal mergers may benefit from all synergy categories. However, overall, horizontal mergers are more likely to benefit from those synergies that place rivals at a competitive disadvantage. Betton et al. (2008) point out that scale-increasing mergers tend to impact the industry equilibrium price negatively, which causes a negative industry effect. For example, a horizontal merger in the shipping industry allows the merged entity to operate its combined fleet under a lower cash break-even as administrative and financing costs can be distributed across more vessels. The lower cash break-even means they can offer lower freight rates and still make a profit, making it harder for smaller companies to compete. A nonhorizontal acquisition from a financial acquirer would not allow for similar market power synergies.

Moreover, Eckbo (2009) points out that efficiency gains are often the primary motivation behind horizontal merger activity. For example, a horizontal merger may increase the combined entity's purchasing power because the bidder and target manufacture the same products. This synergy is primarily associated with horizontal acquisitions because bargaining power comes from higher orders that smaller rivals cannot benefit from. Finally, we recognize that some financial synergies can only be obtained through scale. For example, a merger between two debt-collection businesses would leave them with a more diversified and, thus, less risky portfolio of distressed

debt. This may allow for refinancing their combined debt from their creditors. Nonhorizontal acquisitions may obtain many of the same operational synergies as horizontal ones. Nevertheless, we argue that the synergies are often more visible and more easily implemented in horizontal acquisitions, which may scare investors following the acquisition announcement.

This does, however, not mean that nonhorizontal cannot obtain benefits that hurt competitors. For example, a financial sponsor or a foreign acquirer can improve the target firm's governance, making it a leaner and stronger competitor in a non-horizontal deal. Also, better supply chain control and better coordination between the production process parts may help reduce production costs. With reduced lead times, better inventory management, and other productive efficiencies, nonhorizontal mergers may obtain many of the same operational synergies as horizontal ones. However, market share synergies are the most likely to hurt competitors, not operational synergies. Furthermore, the potential for market share synergies is more significant in horizontal mergers (Chaterjee, 1986).

Finally, we contend that signalling effects leading to positive rival gains are more commonly observed in nonhorizontal acquisitions. For example, gains arising from expectations of future industry growth are more likely to be observed in non-mature industries or markets (Gaur et al., 2009). Moreover, non-mature sectors are more often associated with nonhorizontal M&A activity, such as acquisitions from financial buyers. In contrast, a larger portion of horizontal M&A activity is performed in mature industries as growth proposes limited potential for value creation (Banerjee & Eckard , 1998). Thus, holding everything else equal, nonhorizontal acquisitions should more often benefit from signaling effects such as expectations of industry growth or increased acquisition probability.

4.2 Hypothesis 2 – Predicted Competitive Pressures

In our second hypothesis, we develop a testable implication of the competitive advantage hypothesis. The extant literature is yet to categorize transactions based on the nature of the bid and proceed to interact this variable with firm-specific variables in its regression specifications. By investigating whether variables associated with competitive resilience have different impacts on nonhorizontal and horizontal acquisitions, one may be able to answer if competitive concerns impact investors' decisions to acquire or sell rival shares. Thus, we present the following hypothesis:

*H2_0: In horizontal acquisitions, rivals enjoying larger market shares or superior profitability experience **similar** announcement returns as rivals with weaker competitive positions.*

*H2_1: In horizontal acquisitions, rivals enjoying larger market shares or superior profitability experience **higher** announcement returns than rivals in weaker competitive positions.*

Our prediction follows that smaller firms are more vulnerable to shocks in the competitive environment (Haleblian et al., 2012). In contrast, firms characterized by high market capitalization are more likely to have the financial capacity to respond to these changes. In case the initial merger yield efficiency gains that allow for a reduction in product prices, sizable firms can more easily react by implementing cost-saving strategies or engaging in M&A activity themselves. Additionally, well-established players holding substantial total market sales take longer to outcompete. Customer stickiness and brand recognition are examples of competitive advantages larger firms may enjoy in protecting future cash flow. Additionally, smaller firms entail the liability of smallness, as they find it more challenging to raise capital and comply with government regulations (Baum & Shipilov, 2007). Consequently, they are less likely to respond successfully to increased competition following a horizontal merger.

Contrary, arguments can be made that firms of increased size are less adaptive. Bureaucratic structures and routinized behaviour may result in less innovation and experimentation (Haleblian et al., 2012). As a result, they may be more resistant to making the necessary changes to defend their market position. While we appreciate the argument, we remain confident that well-established players will be preferred among investors when assessing the competitive effects of horizontal acquisitions. In our view, competitive advantages from size likely outweigh investor concerns that the bureaucratic structure cannot adopt in the medium to long term.

Another argument related to market capitalization is its association with the likelihood of becoming an acquisition target. The size hypothesis argues that the acquisition probability decreases with the firm's size (Palepu 1986). Consequently, one should observe lower announcement returns in large rival entities in horizontal and nonhorizontal acquisitions. The reason is that higher transaction costs are associated with acquiring larger firms. Naturally, greater financial capacity is required to acquire a target of greater size. Additionally, expenses related to integration will be higher, making them more demanding targets (Palepu, 1986). As

pointed out in the literature review, it is a well-established phenomenon that the firm's size measured by market capitalization negatively correlates with the reception of takeover bids. Hence, we argue that observing a positive coefficient on the size variable (opposite of what is predicted by the size hypothesis) must reflect the existence of a conflicting force of the APH, which we believe is related to competitive resilience.

Market share is not the only variable that reflects the ability to resist increased competitive pressures from a horizontal merger. We argue that firms already enjoying superior operational profitability should also be less heavily affected. Following our previous argument that cost-efficiency gains would put competitors at a competitive disadvantage, rivals with superior EBITDA margins would be less negatively affected from the merger. Moreover, a high EBITDA margin could reflect strong pricing power or a favourable market position, meaning they face a lower risk of cash flow erosion. Everything else held equal, industry-leading EBITDA margins should positively impact rival announcement returns.

Contradicting this view is the inefficient management hypothesis, which states that firms with ineffective management are likely targets (Palepu, 1986). Given the increased likelihood of becoming a subsequent target, rivals with poor EBITDA margins should therefore experience higher announcement returns. Moeller & Vitkova (2016) find this relationship to persist when assessing a global sample of public horizontal and nonhorizontal and their associated target characteristics. In their analysis, low profitability is the second most statistically significant predictor of a public company becoming an acquisition target following size. We argue that observing a positive coefficient on the EBITDA margin variable (opposite of what is predicted by the inefficient management hypothesis) must reflect the existence of a conflicting force of the APH, which we believe is related to competitive resilience.

4.3 Hypothesis 3 - Ownership Structure

Similar to our second hypothesis, our third hypothesis relates to firm-specific characteristics affecting rival returns. Specifically, we focus on the relevance of ownership structure in the investor's decision to acquire or sell rival shares following acquisition announcements. Despite corporate finance making strong predictions between target returns and ownership structure, empirical evidence is sparse (Bauguess et al., 2009). Not surprisingly, investigation of the relationship between ownership structure and rival gains is, to our knowledge, almost

nonexistent. However, based on the literature investigating the relationship between ownership structure and takeover probability, we reach the following hypothesis:

H3_0: Rivals with concentrated ownership structures experience ***similar*** *announcement returns as rivals with fragmented ownership structures.*

H3_1: Rivals with concentrated ownership structures experience ***higher*** *announcement returns than rivals with fragmented ownership structures.*

Our hypothesis does not necessarily predict positive announcement returns in rivals with concentrated ownership. However, we expect the sign of the coefficient to be positive. Our first argument is related to acquisition probability. As pointed out in the literature review, research on global acquisition targets reveals that fragmented ownership structures are associated with reduced takeover likelihood. Differently, firms with concentrated ownership structures are more likely to engage in M&A activity because they are easier to acquire. Thus, the acquisition probability hypothesis predicts a positive announcement return in rivals with concentrated ownership structures.

Our second argument relates to the probability of successfully responding to increased competition from the merger. Schleifer and Vishny (1996) argued that concentrated ownership gives the investors incentives and power to discipline management. Therefore, ownership concentration can be viewed as an internal governance mechanism. Because concentrated ownership is associated with better governance, we expect these rivals to be more responsive and agile to changes in the competitive environment. For example, the existence of a prominent owner may force a response (if necessary) from management following industry disruptions arising from horizontal M&A activity. Moreover, a majority shareholder may provide additional financial resources or industry knowledge that could help the business compete more effectively against its rivals. Everything else equal, an influential blockholder (e.g., John Fredriksen) could, therefore, partly offset fears of lower future cash flow in horizontal acquisitions.

Oppositely, one may argue that high ownership concentration could be associated with a lower probability of becoming a target. In the spirit of agency theory, a market for corporate control has a disciplinary function of monitoring potential conflicting interests between managers and shareholders (Eckbo E. , 2009). Therefore without internal governance mechanisms (such as concentrated ownership), an acquisition can help reduce agency costs. Furthermore, firms with

large shareholders already have a disciplining function to management, meaning that takeovers as a disciplinary mechanism are unnecessary. However, although there is generally a connection between ownership concentration and the existence of a large active shareholder, this is not always the case. A concentrated ownership structure may consist of many passive shareholders, meaning that rivals with concentrated structures may benefit from a disciplinary merger. Given the consistent relationship between takeover probability and ownership concentration, we believe rivals will gain from concentrated structures.

Finally, large blockholders may have a negative effect on the acquisition probability of the rival. As pointed out in the literature review, blockholders may be more reluctant to sell shares if they are families, governments, or parent companies. Given that ownership concentration and blockholders may affect rival returns differently, we must distinguish between variables capturing the ownership concentration and the existence of blockholders, although they are often connected.

5 Data

We use four databases to construct a sufficiently large sample for testing our hypotheses. These are (1) SDC platinum for data on Norwegian M&A activity, (2*)* Børsdatabasen for stock prices on listed Norwegian firms, (3) Refinitiv Eikon for refinitiv business classification codes (TRBC) and (4) Regnskapsdatabasen for financial statements and ownership data on rivals of Norwegian acquisition targets. The section is structured as follows. First, we present the databases, the retrieved data, and our data-cleaning process. Next, we define and describe the explanatory variables used in the analysis section. Finally, we include descriptive statistics covering the basic characteristics of our dataset.

5.1 Data Sources & Cleaning

5.1.1 SDC-Platinum: Transaction Overview and Characteristics

We extract data on Norwegian M&A announcements from the SDC platinum database. The database contains comprehensive data on M&A activity, including public and private takeover bids on Norwegian targets. We download 10 176 takeover bids from 1995-2020. In addition to an extensive overview of acquisition attempts, SDC-platinum provides valuable deal-specific information for financial research. These include data points on (1) the announcement date of

the bid, (2) the % of shares acquired conditional on a successful transaction, (3) the sought ownership of the takeover bid, (4) the % owned in target after the completed transaction, and (5) the deal status (i.e., completed vs. withdrawn). We retrieve all variables listed above. In addition, we collect the name, industry and nation of each acquirer and target. Finally, we extract the deal synopsis of each transaction to secure the data's validity.

First, we remove all deals where the acquirer sought under 66.7%. In this stage, we lose 6413 observations. Moreover, we filter out the transactions where the target is a non-listed entity, as we cannot observe the announcement returns of non-listed targets. As a result, we lose 3452 observations and are left with 311 bid announcements. Next, we manually inspect each bid announcement and find that some announcements are related to the same deal. For example, several acquirers compete for the same target, or the acquirer increases its existing shareholding. Because these announcements may provide different signals than the initial bid announcement, we filter them out. As a result of this, our final bid announcement sample consists of 256 observations.

Next, we match the targets with their respective rivals based on their 8-digit TRBC code. We obtain a total of 1032 rivals. Because we study variation within deals (i.e. clustered deals), we remove all deals involving a target with only one or no listed rivals. In this stage, we lose 93 observations, leaving us with a sample of 163 acquisitions connected with 987 rivals. To secure the validity of our industry classification, we manually control the refintiv business classification codes (TRBC) of randomly selected firms in our sample. Finally, we stress that a critical factor in securing the validity of our results is that the announcement date identified in the data is the correct one. Therefore, we manually verify and adjust announcement dates, comparing SDC platinum data points to company disclosures and financial media.

While SDC-platinum reports successful and unsuccessful bids on US data more frequently, Norwegian data primarily consist of successful bids. Unfortunately, no unsuccessful bids made it through our filtering process. Consequently, we are not able to analyze announcement returns following deal terminations.

5.1.2 Refinitiv Eikon: Industry Classification Codes

Appropriate industry classification is among the most essential preconditions for our research to be valid. Measuring non-competing rival returns would bias our results. Therefore, we have

thoroughly reviewed numerous sector classification systems, including standard industrial classification codes (SIC), nomenclature des activités économiques dans la communauté européenne (NACE), and the refinitiv business classification codes (TRBC).

Existing literature mainly uses SIC codes as their industry classification system. The SIC codes are primarily used to classify U.S. companies, with their European equivalent being NACE codes. The Norwegian classification system is based on NACE with minor differences (Statistisk Sentralbyrå, 2008). However, a weakness of the NACE and SIC classification systems is that they are production-based rather than market-based (European Commission & Eurostat, 2017). Production-based systems are based on materials used in manufacturing to determine sector classification, while market-based systems capture the market in which participants operate. The Refinitiv Business Classification (TRBC) is a market-based classification system classifying organizations based on the market they serve. We argue that the latter is more appropriate in identifying relevant rivals in our study.

The TRBC codes follow a hierarchical ID going from non-specific two-digit codes (e.g., energy) to detailed ten-digit sub-classifications (e.g., coal mining support). One could argue that ten-digit codes would most appropriately assess rival abnormal returns. However, the subclassifications tend to be very specific, limiting the number of listed rivals in our sample to one and often zero competitors. Our ambition is to ensure that our classification system reflects appropriate rivals, and we find that eight-digit codes perform well in balancing specificity with rival portfolios of sufficient size. We, therefore, proceed with eight-digit codes for our analysis. We also extract ISIN numbers from Refinitiv Eikon to appropriately link them to financial data from Børsdatabasen.

5.1.3 Børsdatabasen: Stock Prices and Stock Market Index

Børsdatabasen is a database developed by the Norwegian School of Economics, containing financial market data on Norwegian listed firms. An ISIN number identifies every security listed on the OSEAX. First, we match the ISIN numbers from Børsdatabasen with the ISIN numbers from Refinitiv Eikon to correctly attribute the relevant TRBC code to each company. Next, we extract daily stock prices on listed targets and their associated rivals between 1995-2020. In addition, we collect the daily returns of the Oslo Børs all share index (OSEAX) in the same time interval. Finally, we extract the adjusted share price of the target and rivals to ensure that our

abnormal return calculation is unaffected by corporate events (e.g., stock splits and dividend payments).

5.1.4 Regnskapsdatabasen: Accounting and Ownership Variables

Regnskapsdatabasen is a database containing fundamental financial and corporate data on active and inactive Norwegian companies. The database is based on digitally available register data and aims to support research on Norwegian private and public entities (Mjøs & Selle, 2022). We extract variables to use them as explanatory factors or to successfully construct variables of interest (e.g., current ratio). The following variables are extracted for all rival firms in our sample: (1) book value of debt, (2) total revenue, (3) current assets, (4) current liabilities, (5) total assets, (6) total liabilities, (7) largest shareholding, and (8) the Herfindahl-Hirschman-ownership index.

5.2 Variables

In this subsection, we motivate the inclusion of variables used in our regression models. As a reminder, we divide our regression analysis into two parts. In the first part, we aggregate the rival returns into portfolios and use the portfolios' CAR as the response variable. In the second part, we use the CAR of each individual rival as the response variable. Because of this separation, the first regression analysis uses solely deal-specific variables to explain rival returns. Differently, the second regression analysis uses deal-specific and firm-specific variables to explain rival returns. However, our focus is on the significance of the firm-specific variables in the second regression analysis. In the following, we present key explanatory variables to answer our hypotheses and other variables that we believe could impact rival returns.

5.2.1 Variables used in the deal-specific regression analysis

5.2.1.1 Key explanatory variables

Horizontal vs. nonhorizontal

We create two subsamples, separating the rivals into horizontal and nonhorizontal acquisitions. The horizontal subsample consists of acquisitions where the acquirer and the target share the same TRBC code at the time of the acquisition announcement. The nonhorizontal subsample may include vertical acquisitions, investments from financial sponsors and unrelated acquisitions. Through this division, we aim to investigate whether investors react differently to transactions involving two companies in the same industry than transactions involving companies in separate

segments or industries. As a reminder, we argue that horizontal acquisitions, on average, impact rivals' cash flows more negatively, so we should observe lower rival announcement returns in horizontal than nonhorizontal acquisitions.

5.2.1.2 Other explanatory variables

Industry concentration:

We use the number of listed firms in the industry at the time of the acquisition announcement as a proxy for industry concentration. Higher industry concentration is associated with lower competition, but rival interdependence is usually higher. In other words, in concentrated industries, a strategic initiative by one firm is likely to be felt strongly by its rivals (Scherer & Ross, 2009). Because M&A is more likely to affect competitors in concentrated industries, we consider controlling for the degree of industry concentration necessary.

In the spirit of the acquisition probability hypothesis, one may argue that fragmented industries leave future acquirers with more alternative acquisition targets, lowering the probability of becoming the next target for rival firms. Therefore, rivals in fragmented industries may experience lower announcement returns. However, due to their interdependence, rivals' future cash flow may be more heavily impacted in concentrated sectors. Thus, following this argument, fragmentation should be positive for rivals' announcement returns.

Horizontal * Industry concentration

A change in the rival's acquisition probability does not depend on whether the transaction is horizontal or non-horizontal. Therefore, including an interaction term would partly separate the negative industry fragmentation effect predicted by the acquisition probability hypothesis from the positive effect predicted by the competitive advantage hypothesis. Because rivals in concentrated industries are more interdependent, and we argue that horizontal merger activity impacts rival cash flows more significantly, we expect the interaction variable to be statistically significant and positive. That is, the effect of a horizontal transaction in a fragmented industry may be too small to be sensed by other players (Gaur et al., 2013).

Relative deal size

We proxy for the relative deal size by dividing the target's market capitalization by the combined market capitalization of all listed firms sharing the same TRBC code. Because larger acquisitions are more likely to impact rival returns, we consider it necessary to control for. Chatterjee (1986)

points out that synergies arising from M&A are limited to the target size. For example, the target size constrains the potential for gains related to the economics of scale/scope. In other words, more sizable deals are typically associated with greater potential for synergies. Overall, this should have a more harmful impact on rival cash flow, coinciding with negative rival announcement returns. Therefore, if significant, we expect the coefficient to be negative.

Target abnormal returns

Few transactions in SDC Platinum contain data on the premium paid by the acquirer. Therefore, we use the abnormal stock price return in the target during the event window [-1,1] to proxy for the bid premium of all deals. In our view, it figures well as a proxy for the "real" premium paid, as it partly includes potential run-up effects in the target stock price. However, the target price will usually not perfectly converge towards the premium price, following the risk of a non-successful transaction. Hence, we systematically underestimate the bid premium.

A higher bid premium should have explanatory effects on rival returns. A higher premium reflects a higher willingness to pay for the target's assets and could thus have essential signalling effects. The high premium could, for example, reflect scarcity in productive resources (e.g., semiconductors) or signal expectations of strong industry growth. Alternatively, a willingness to pay may result from firm-specific characteristics that make the target attractive. Rivals with similar features should therefore experience significant positive returns. In conclusion, higher bid premiums may yield more significant positive rival returns.

Initial industry target (IIT)

We previously pointed out that surprising acquisitions have a more significant information effect on the market. This relationship is well documented in the extant literature and must therefore be controlled for. Consistent with Walkling & Song (2000), we proxy for the surprise effect by defining and including a dummy variable capturing whether the target is an initial industry target. Per our definition, the target is an initial industry target if there have been no private or public deals exceeding 2 USDm in the industry for the past twelve months. Our criteria leave us with 66 initial industry targets. Because the signalling effect should positively impact rivals in both horizontal and nonhorizontal acquisitions, we expect the IIT dummy to be significant with a positive coefficient.

Foreign acquirer

Transactions where the acquirer is a foreign entity, may impact rival gains differently than transactions where the acquirer is domestic. First, the positive signalling effect may be stronger when an international acquirer shows interest in the industry. Given the modest relative size of the Norwegian economy, interest from large multinational entities or asset managers may positively impact rival returns. Moreover, it may create an impression among investors that more potential acquirers exist than initially assumed. Given the above, rival announcement returns should be greater when the acquirer is foreign.

An alternative view is that a foreign acquirer increases the competition in the industry. Foreign companies expanding through M&A have likely already experienced domestic success, meaning they more likely possess a competitive advantage that could hurt rivals' cash flows. Everything else equal, this should negatively impact rival returns. Moreover, the market power hypothesis predicts lower announcement returns when the acquirer is foreign. Dissimilar to a domestic acquisition, an international transaction does not decrease the number of competitors, meaning that rivals do not gain from tacit collusion. Thus, rival announcement returns should be lower when the acquirer is foreign.

Horizontal * Foreign acquirer

Both rivals in horizontal and nonhorizontal acquisitions would benefit from the signalling effects outlined above. However, fears that the foreign acquisition will impact rivals' future ability to generate cash flow are more likely to impact returns in horizontal transactions, we argue. For example, Ryanair acquiring the airline company Norwegian would likely create more fear among rival investors than a bid from a financial acquirer. By interacting the horizontal dummy with the foreign acquirer dummy, we aim to separate out the negative effects from increased competition. Given the above, we expect the coefficient of the interaction term to be negative.

5.2.2 Variables used in the firm-specific analysis

5.2.2.1 Key explanatory variables

Market share * Horizontal

We use market share as one of two proxies to capture the competitive position of the rival. To estimate the rivals' market share, we divide their revenue by the combined revenue of firms in our sample with the same TRBC code. As discussed in the hypothesis development section, we expect large market shares to positively impact rival returns in horizontal acquisitions. However,

a large market share will likely decrease rival returns from increased acquisition probability in horizontal and nonhorizontal acquisitions. Therefore, holding everything else constant, rivals in horizontal acquisitions should obtain higher announcement returns than nonhorizontal acquisitions. Should this proposition hold, the coefficient of the interaction variable should be statistically significant and positive.

EBITDA margin * Horizontal

We use the EBITDA margin as the second of two proxies to measure rivals' competitive position. A high EBITDA margin relative to competitors could indicate a competitive advantage. The advantage may protect the future ability to generate cash flow relative to inefficient competitors. Thus, following horizontal acquisitions, we expect rivals with high EBITDA margins relative to competitors to obtain higher announcement returns. However, the extant literature sometimes finds that poor operational performance increases takeover likelihood. The likely reason is that poor performers are lower valued and propose more significant synergy potential. If true, higher EBITDA margins should negatively impact rival returns in horizontal and nonhorizontal acquisitions. Nevertheless, we believe nonhorizontal acquirers, such as private equity firms, are likelier to prefer targets with poor operational performance than horizontal acquirers. Horizontal acquisitions usually have strategic motives, meaning the bidder more often seeks to acquire companies that complement their existing operations. In other words, we believe high EBITDA margins are less likely to contribute to negative acquisition probability in horizontal acquisitions. Taking together, a high EBITDA margin should positively impact announcement returns in horizontal acquisitions, so we expect a positive coefficient.

% of shares held by the largest shareholder

The shareholding of the largest shareholder is the first of four proxies we use to capture the effect ownership concentration has on rival returns. We calculate it by dividing the number of shares held by the largest shareholder by the total outstanding shares in the company. Although concentrated ownership structures generally make acquisition targets easier to acquire, a majority shareholder may impact acquisition probability negatively. As previously argued, blockholders such as governments or families may be reluctant to engage in M&A activity because they fear losing control. Moreover, the likelihood of needing a disciplinary merger is lower when a shareholder holds majority control. As a result, we expect the variable's coefficient to be negative.

% of Shares held by the largest shareholder * Horizontal

We previously argued that a significant shareholder could positively impact a firm's ability to respond successfully to the changes in the competitive environment following the merger. Greater shareholding incentivizes investors to engage with the company. Moreover, a majority shareholder may provide additional financial resources or industry knowledge that could help the business compete more effectively against its rivals. By interacting the % shares held by the largest shareholders with the horizontal dummy, we aim to separate this effect from potential takeover likelihood effects. If our proposition holds, the coefficient should be positive.

Herfindahl-Hirschman Index on ownership concentration (HHI)

The Herfindahl-Hirschman index is the second of four proxies we use to capture the effect of ownership concentration. It is calculated by squaring the percentage holding of each shareholder and subsequently adding them. An HHI value of 1 describes a company with only one shareholder. A value of 0.01 represents a company characterized by a fragmented ownership structure. Formally the HHI can be derived as:

$$HHI_j = \sum_{i=1}^{n} S_{ij}^2 \qquad (5.1)$$

Because the extant literature finds that higher ownership concentration is associated with a higher likelihood of engaging in M&A activity, we expect rivals with concentrated ownership structures to experience higher announcement returns.

HHI * Horizontal

If the majority shareholder is not actively monitoring management and the remaining shareholders have limited voting power, the firm may still suffer from agency costs (Himmelberg et al., 1999). In other words, a significant majority shareholder may not always discipline management to take action following an industry merger announcement. Several shareholders holding significant ownership increase the odds that the firm has access to financial resources or industry knowledge to successfully respond to the change in the competitive environment. In other words, the interaction term between the HHI index and the horizontal dummy may be significant and positive.

Blockholder holding 10%

A dummy variable taking the value one if a blockholder holds 10% or more of the outstanding shares is the third of four proxies we use to capture the effect of ownership concentration. The most common approach when acquiring a Norwegian listed company is a voluntary tender offer with a subsequent squeeze-out (Aabø-Evensen et al., 2022). An acquirer may perform a squeeze-out if it holds at least 90% of the outstanding shares (Astrup Borch, 2023). In other words, a blockholder owning 10% of the outstanding shares may block the acquisition. Also, a shareholder owning 10% may demand an extraordinary general assembly to influence other shareholders' decision to tender their shares, increasing the transaction risk. Therefore, investors in rival firms may consider the existence of the blockholder as a hinder to becoming a subsequent target. Consequently, one may observe a negative relationship between the existence of a blockholder holding 10% of the shares and rivals' announcement returns.

Blockholder holding 10% * Horizontal

Similar to before, we include an interaction variable to observe if differences exist between horizontal and nonhorizontal acquisitions. Firms without blockholders owning 10% may lack influential owners with voting power, which could make them less likely to respond successfully to a merger involving their rivals. In addition, the absence of a blockholder of 10% could mean that the rival has less access to financial resources or industry knowledge required to respond to the merger. Thus, if significant, we expect the coefficient of the dummy variable to be positive.

Blockholder holding 33% (Negative control)

A dummy variable taking the value one if a blockholder holds 33% or more of the outstanding shares is the fourth and final proxy we use to capture the effect of ownership concentration. First, a shareholder owning 33% of the shares may block a statutory merger if she chooses. More importantly, a shareholder holding 33% is likely to assert significant influence over the board's decision to recommend the acceptance of the bid or not. In our view, blockholders owning 33% or more of a listed firm are unlikely passive shareholders such as investment funds. Instead, they are likely governments, parent companies (e.g., Aker) or wealthy individuals (e.g., John Fredriksen). For example, the Norwegian government holds ownership positions exceeding 33% in DNB, Telenor, Norsk Hydro and Yara. Assuming most firms with a shareholder owning more than 33% fit into the ownership categories outlined above, we believe they are considered less likely acquisition targets by equity markets. Therefore, we expect the coefficient to be negative if significant.

Blockholder holding 33% * Horizontal

We include an interaction term between a blockholder holding 33% and the horizontal acquisition. Similar to the rationale behind the "largest shareholder" variable, we argue that a strong owner is a valuable asset for a firm where its rivals engage in a horizontal merger. Because financial markets may appreciate strong owners such as wealthy individuals or a parent company, we expect to observe higher announcement returns in rivals, with a blockholder owning 33%. One may argue that state ownership above 33% could be an exception because the primary ownership motivation is protecting the firm from foreign takeovers, making them passive shareholders. However, given that 40% of our rival sample has a shareholder with negative control, state ownership likely accounts for a minor fraction of it. Thus, if significant, we expect the variable to be positive.

5.2.1.2 Other explanatory variables

Horizontal vs. nonhorizontal acquisitions

Although this section focuses on firm-specific variables that may impact rival returns, we include the horizontal vs. nonhorizontal acquisition variable to compare its significance against the regression models where portfolio CAR is the dependent variable. We feel confident we can reject our first hypothesis if the variable is significant in both analyses.

EBITDA margin

As previously argued, a high EBITDA margin could decrease takeover likelihood. If this is the case, the standalone variable should be statistically significant and negative. Oppositely, we expect the interaction term between EBITDA margin and horizontal transactions to be positive as a higher relative EBITDA margin likely captures a stronger competitive position.

Market Share

Empirical evidence shows that high market capitalization is associated with lower takeover likelihood. Our data show a strong correlation between market share and market capitalization. Thus, the standalone variable should be statistically significant and negative if acquisition probability is the main driver behind rival returns. As a reminder, we argue that the interaction variable between market share and the horizontal dummy should be statistically significant and positive.

Current ratio

Consistent with the extant literature, we use the current ratio as a proxy for the rivals' liquidity position. Some evidence suggests that lower liquidity is associated with a higher probability of becoming an acquisition target. Companies with poor liquidity may be hindered from capitalizing on profitable investment opportunities, which could attract acquirers possessing the financial power to realize investment opportunities. Moreover, the merger could force the rival to explore strategic options to survive. Therefore, rivals with poor liquidity may experience higher announcement returns. Alternatively, poor liquidity could mean that the rival is more sensitive to changes in the competitive environment. In other words, their cash flow could be more heavily impacted than firms enjoying a solid financial position.

Debt-to-equity ratio

We divide the book value of debt by the book value of equity to control for the effect leverage may have on rival announcement returns. Research on takeover probability consistently includes variables capturing the effect of the target's leverage. However, it is inconsistent in its assessment of the leverage's relevance. First, high leverage could increase takeover probability as the company may be vulnerable to financial distress and have limited financing options. Thus, firms with healthier financial positions can realize profitable investment opportunities. High debt and fears of financial distress may also result in undervaluation by the market, given the rival's debt burden. This could make them attractive takeover candidates. Oppositely, a possible motive for an acquisition could be unused debt capacity in the target. Therefore, low-leverage rivals may be considered more likely subsequent targets. Furthermore, similar to poor liquidity, high debt may hinder an appropriate response to changes in the competitive environment.

Tobin's Q

Consistent with Walkling & Song (2000), we use Tobin's Q to proxy for the effect valuation may have on rivals' announcement returns. Formally, we calculate Tobin's Q as:

$$Tobins\ Q = \frac{S + P + D - NWC}{TA} \qquad (5.2)$$

In equation 5.2, S is the market value of equity, P is the liquidating value of preferred shares, D is the book value of non-current liabilities, NWC is the net working capital, and TA is the book value of total assets. Rivals that trade on a discount to peers are more likely to be acquired. Thus,

assuming that Tobin's Q successfully captures the firm's valuation, the variable's coefficient should be negative.

5.3 Descriptive Statistics

In the following subsection, we present descriptive statistics of our sample. First, table 5.1 shows descriptive statistics on the explanatory variables used in our deal-specific analysis. Next, table 5.2 provides an overview of the explanatory variables used in our firm-specific analysis. Both tables report minimum, median, mean, and maximum values and each variable's first and third quartile. Finally, table 5.3 reports the distribution of our sample across time.

5.3.1 Deal-Specific Variables

Table 5.1 Descriptive Statistics – Deal and Industry-Specific Characteristics

	N	Yes	% of total		No	% of total	
Horizontal	163	52	32%		111	68%	
Initial industry target	163	51	31%		112	69%	
Foreign acquirer	163	66	40%		97	60%	
	N	Min	1st quartile	Median	Mean	3rd quartile	Max
Relative deal size	163	0.05%	2.39%	8.51%	20.53%	27.31%	88.66%
Target abnormal returns	163	-3.11%	3.72%	15.04%	17.57%	25.50%	87.68%
Industry concentration #Firms	163	3	4	7	8.16	13	21

Because we aggregate the rivals sharing the same TRBC code in the deal-specific analysis, the 987 rival firms are distributed across 163 portfolios. Compared to reviewed literature, our sample size does not deviate significantly. Furthermore, approximately 32% of our overall sample are horizontal acquisitions, which fits our ambition to investigate horizontal transactions specifically. Finally, compared with the extant literature, we have enough data points on initial industry targets and foreign acquirers to examine if the variables impact rivals' announcement returns.

We note that the minimum value of target abnormal returns is -3.11%. At first glance, one may be surprised that a transaction yields negative announcement returns in the target. A possible explanation is that stock price runups before the announcement exceeded the premium size presented on the announcement day. In other words, investors possessing information about the bid before the announcement expect a more sizable bid premium. We manually check the outliers on abnormal returns to adjust for confounding events. We do not find any confounding events and hence do not remove any outliers.

By definition, the minimum number of firms sharing the same TRBC code in our sample is three. As covered in section 5.1, we remove all transactions where only one rival was identified. The reason is that transactions with only one rival do not allow us to cluster rival returns into portfolios. Because the number of firms in the industry includes the target firm, the minimum number of firms in our sample is three.

5.3.2 Firm-Specific Variables

Table 5.2 Descriptive Statistics – Firm-Specific Characteristics

	N	Yes	% of total		No	% of total	
Blockholder (33.4%)	987	391	40%		596	60%	
Blockholder (10%)	987	840	85%		147	15%	
	N	Min	1st quartile	Median	Mean	3rd quartile	Max
% of shares held by largest shareholder	987	0.022	0.138	0.259	0.320	0.484	0.906
Herfindahl–Hirschman index (ownership)	987	0.005	0.041	0.111	0.182	0.264	0.822
EBITDA margin	987	-3.41	-0.001	0.126	-0.0380	0.330	0.837
Market share	987	0.001	0.010	0.047	0.157	0.165	0.967
Current ratio	987	0.049	1.085	1.606	2.750	2.518	21.135
D/E	987	0.001	0.311	1.063	3.21	3.211	27.688
Tobin's Q	987	0.205	0.994	1.253	1.812	2.018	6.231

Table 5.2 provides an overview of the variables used in our firm-specific analysis. We observe that 40% of the rival firms have an owner with negative control at the time of the acquisition announcement. Furthermore, 85% of the rivals have a blockholder holding at least 10% of the outstanding shares. Our sample fits well with La Porta et al. (1999), finding that in most countries excluding the Anglosphere, listed firms often have a blockholder of significant size. Furthermore, the ownership structures of our sample appear concentrated, with the median and mean ownership positions of the largest shareholders being ~25.9% and ~32%, respectively. Our sample is consistent with the findings of Døskeland & Mjøs (2009), who find that concentrated ownership structures generally characterize the OSEAX.

The EBITDA margins of rival firms vary greatly. This is a natural consequence of divergence in industry economics, which is controlled for in our analysis through industry clustering. Though most rival firms in our sample obtain a positive EBITDA, 69 rivals suffer from operational losses, which causes a negative minimum EBITDA margin. Furthermore, we observe significant variation in the rivals' market share, with min and max values being 0.01% and 97%, respectively. Also, in this case, we manually verify the outliers and find no reason to remove any observations. Finally, other accounting variables also experience significant variation. We do not observe any

overall patterns as these variables will vary significantly across industries. Nonetheless, the wide variation highlights the importance of industry clustering.

5.3.3 Deal Distribution

Table 5.3 reports the distribution of our sample across time. Our sample is well distributed across decades, allowing us to investigate systemic patterns over time. However, clustering deals across decades is necessary, as omitted variables may change over time.

Notably, ~11% of our sample involves acquisition announcements from 2008. We suspect the upturn in transaction activity in 2008 was related to financial turbulence during the financial crisis. Furthermore, we find that the motives behind transaction activity were likely different in this period than in other years. For example, the financial turbulence may have forced large involuntary selloffs, which could spread fear of similar trading in rival firms. More importantly, investors are more uncertain and risk-averse during financial and economic turmoil, causing increased volatility and greater sensitivity to news and events. Therefore, rival returns during this period may not be comparable to other years. Similarly, the sharp drop in oil prices in 2014 may have forced corporate restructurings resulting in higher transaction activity. Again, this may have resulted in fears that rivals would experience a similar situation when stock prices were more sensitive to signalling effects.

Table 5.3 Deal Distribution

Year announced	Number of firms
1996	3
1997	4
1998	6
1999	12
2000	9
2001	8
2002	4
2003	7
2004	3
2005	8
2006	12
2007	9
2008	19
2009	8
2010	9
2011	5
2012	6
2013	4
2014	11
2015	2
2016	5
2017	4
2018	2
2019	3
Total targets	163

Given the above, we repeat our regression analyses on a sample excluding the transaction activity in 2008 and 2014. The results are reported in the robustness section.

6 Methodology

The following section covers the two methodological frameworks we use in our analysis.
In the first subsection, we introduce event studies and discuss our course of action to satisfy their underlying assumptions. Next, we cover the design of our event study, discussing flexibility related to the estimation of normal performance. Finally, the second subsection briefly

introduces OLS regression and its relevance for investigating our hypotheses. However, we defer most discussions of standard econometric methods and tests to section 8 and appendixes.

6.1 Event Studies

6.1.1 Introduction to Event Studies

Event studies are powerful methodological frameworks serving a twofold purpose. First, price-based event studies were designed to test the efficient market hypothesis. This involves testing the impact (speed and efficiency) new information has on security prices. Later, value event studies emerged. Value event studies are designed to examine a specific event's attributable effect on the market value of one or more firms. Because stock prices reflect investors' assessment of current and future cash flows, their change should reflect the financial impact anticipated by investors (McWilliams & Siegel, 1997).

Because event studies can be designed to estimate the attributable effect of an economic event (such as an acquisition attempt) on one or more firms' perceived value, it fits our interest in rival returns well. Our firm-specific event is the announcement of the intention to acquire a target. This information is often made available to the market at the same time as the bid is submitted. Sometimes, however, corporations announce their intention to acquire before submitting the bid. Consequently, we define our event as a publicly announced intention of performing an acquisition. Data from SDC-platinum also include rumoured bids. We exclude rumoured bids from our event sample because great uncertainty exists about the initial emergence of such a rumour.

The event study method divides the time surrounding the event into four distinct periods. These include (1) an estimation window to measure normal stock performance, (2) a hold-out window to exclude confounding events and information leakages, (3) an event window to observe the event's effect, and (4) a post-event window. In the next section, we elaborate on the four windows. Additionally, we present them now in the context of three underlying assumptions that must be satisfied for event studies to remain unbiased. These are: (A) markets must be efficient, (B) the event must be unanticipated and (C) there cannot be any confounding effects.

Efficient markets: The market efficiency theory (EMH) is an underlying assumption in most financial literature (McWilliams & Siegel, 1997). Because the market efficiency theory states that the stock price of the acquisition target (and its rivals) incorporates all relevant information

available to the market participants, the market values quickly incorporate any new and relevant information. Should this condition not be satisfied, the abnormal returns in our event study will not fully reflect the investors' view on the event's effect on current and future cash flows. In other words, it would leave us with inconclusive results on how acquisition announcements affect rival returns.

Because investors need time to form an opinion on new information and do not reach conclusions simultaneously, we measure the event's impact over some time (McWilliams & Siegel, 1997). However, constructing an event study with an extended event window could be considered a violation of the market efficiency assumption. Therefore, we use relatively short event windows. However, we perform our tests on multiple event windows to secure the robustness of our results.

Unanticipated events: The event must be unexpected for the returns in the event window to reflect the attributable effect of the acquisition announcement correctly. If market participants are aware of the announcement due to leakages, the attributable effect will partly or in its whole be reflected in the stock price before the event window. As target firms usually experience dramatic stock price runups before the acquisition, the condition of unanticipated events can be challenging to satisfy in M&A research (Tang & Xu, 2016).

We argue that the methodological weakness is unlikely to impact our results. The reason is that we investigate abnormal returns in rival firms instead of target firms. Should information leakages occur, we believe market participants would respond by acquiring target stocks rather than rival stocks. In other words, we find it unlikely that investors will speculate that rivals may enjoy positive abnormal returns. Additionally, Khan & Myrholt (2018) find that CAR in Norwegian targets in the runup period [-50, -1] is non-statistically significant at 2.8%. Their findings imply minor leakage effects, which in turn would likely not affect rivals of targets materially. Hence, we do not take any specific precautions to adjust for the risk of anticipated events apart from manually controlling the announcement dates.

No Confounding Effects: The third condition is that the event's effect must be separated from the impact of other events during the event period. This condition is arguably the most critical one in the event study methodology (McWilliams & Siegel, 1997). When manually examining outliers, we identify several confounding effects that may bias our abnormal return calculation. Some

examples are other merger-related activities, restructuring activities, presentation of quarterly results, declaration of dividends, announcements of contract or products, or change in key personnel.

We take multiple precautions to adjust for confounding events in our event and estimation windows. Firstly, as mentioned in section 5, we use adjusted share prices of targets and rivals. Consequently, we adjust for corporate events such as dividend payments. Secondly, we manually examine positive and negative outliers and delete observations where we suspect a confounding impact. Finally, for robustness purposes, we rerun our regressions, excluding periods of extraordinary market volatility (i.e., 2008 and 2014).

6.1.2 Structuring an Event Study

One may use multiple procedures to construct an appropriate event study. We use the one presented in McKinley (1997). First, we identify the event of interest. Because we aim to investigate the industry-wide implications of an acquisition attempt, we define the event of interest as the acquisition announcement date. In practice, researchers often expand the event period to multiple days, including at least the day of the announcement and the following day (MacKinlay, 1997). As per Clougherty and Duso (2009), we define [-1,1] as our primary event window. This window should capture the announcement effects even if the acquirer announces its bid after the market closes. Additionally, consistent with the extant literature, we add [-2,2] and [-5,5] for robustness purposes.

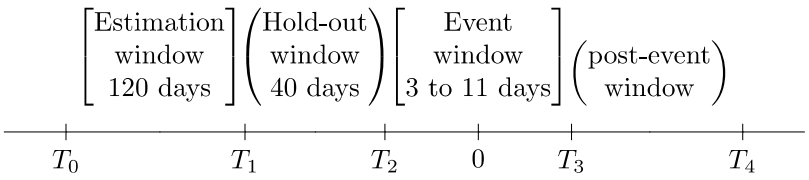
The second task is to determine the selection criteria for a given firm and summarize sample characteristics. We cover our selection criteria and descriptive statistics in section 5.1. Next, one must construct a fabricated counterfactual to measure the event's impact. The counterfactual intends to estimate stock performance if the event did not occur. By subtracting the counterfactual from the observed return, one obtains the abnormal return of the stock. For firm i, the abnormal returns in the event period t can be described as:

$$AR_{it} = R_{it} - E(R_{it}|X_t) \qquad (6.1)$$

R_{it} is the observed performance and $E(R_{it}|X_t)$ represents the fabricated counterfactual. One may construct the counterfactual in several ways. We cover this in detail in the next subsection. Independent of the method one uses, precedent stock prices are vital in calculating the

counterfactual. The stock prices should be retrieved from an unbiased estimation window from confounding events. We follow the procedure of McKinley (2000), suggesting that daily data from 120 days before the event is a sufficiently long period to provide a precise estimate. Despite our confidence that leakage effects will not significantly impact the return of rivals, we define a hold-out window. We use the window to secure that potential industry disturbances or confounding effects do not affect the estimation of normal stock performance. We define our hold-out window as 40 days before the acquisition to adjust for potential biases sufficiently. The specified period follows evidence from Betton et al. (2008), finding cumulative abnormal returns in targets as early as 40 days before the acquisition announcement (Gaughan, 2015). Figure 7.2 summarizes the structure of our event study:

Figure 6.1 Event Study Structure



6.1.3 Estimating Normal Performance

Modelling stock performance under the condition that no event occurred follows no definite methodology. One can briefly divide alternative models into statistical and economic models. The former alternative is solely based on historical statistical performance, while the latter includes economic arguments to determine expected performance (MacKinlay, 1997). In the following, we present two alternative statistical models based on popularity in the extant literature and our available data.

6.1.3.1 The Market Model

The market model is among the most frequently used (and widely accepted) methodologies to predict normal performance. The model posits that the only source of systematic risk is market risk. This assumption is consistent with the capital asset model (CAPM) asserting that the return on the security will continue to develop according to its historical performance relative to the market. However, a notable difference from the CAPM is that the intercept is a constant rather than a risk-free rate.

$$R_{it} = \alpha_{it} + \beta_i R_{mt} + \epsilon_{it} \qquad (6.2)$$

Equation 7.1 describes the expected return R for security i at date t. The alpha (α) and beta (β) are parameters obtained through regression of the returns of the security on the return of the market. We use the OSEAX (Oslo Børs all share index) as our market portfolio. We do this because our sample is listed on Oslo Børs at the announcement date and during the estimation period. In summary, the OLS regression estimates normal stock performance based on precedent relationships between the stock and the market in the estimation window.

6.1.3.2 The Market-Adjusted Model

The market-adjusted model is another statistical model used to estimate normal performance. One can view the model as a restricted version of the market model where α_i is constrained to be zero and β_i is constrained to be one (MacKinlay, 1997). A benefit of the model is that it does not require an estimation period to estimate normal performance. Furthermore, because it estimates normal performance based on the market index, it removes the possibility of standard variation bias arising from confounding events during the estimation window. However, an apparent weakness of the model is that it does not adjust for the distinct systematic risk profile of the individual entity.

6.1.3.3 Choice of Normal Performance Model

The results of our analysis could be affected by the normal performance model choice. Although the literature does not clearly answer which model provides the best estimates, Mackinley (1997) recommends using the market model if data from the estimation window is available. Our review of similar literature to ours also favours the market model. We choose the market model to estimate normal performance because we have data for most of our sample. We omit rivals that do not have available stock data during the estimation period or the event window. Although we do not use the market-adjusted model in our analysis, we include it as a part of our robustness check in section 8.

6.1.4 Aggregating Abnormal Returns

We aggregate abnormal returns across the event window for each separate entity (e.g., [-1,1]). Following this procedure, we obtain one cumulative abnormal return (CAR) for each rival. However, they are not independent because the rival returns are measured in the same period and industry. Thus, when discussing the significance of abnormal returns, one should also report results with grouped rivals (Walkling & Song, 2000). Furthermore, sufficient evidence confirms

that the composition of rival portfolios yields enough power to observe the industry-wealth effects of merger activity (Betton et al., 2008). Following this reasoning, we investigate both the abnormal returns of each individual rival and rival portfolios.

$$CAR_i(t_2, t_3) = \sum_{t=t_2}^{t_3} \mathrm{AR_{i,t}} \qquad (6.3)$$

Individual aggregation of rival abnormal returns is performed as described in equation 6.3. First, we define the length of the event window used in the cross-sectional analysis. We use a three-day event window ([-1,1]), similar to literature similar to ours. Next, we add the event window returns to form the aggregated return during the event period. Finally, conditional on the event not taking place, the predicted returns are subtracted from the aggregated returns to compose the cumulative abnormal return (CAR) for each security. Thus, we have one CAR per rival (N = 987). For our portfolios, we follow the same procedure. However, because we use the abnormal returns of each portfolio, we are left with one CAR per portfolio of rivals (N = 163).

$$CAAR_p(t_2, t_3) = \frac{1}{N} \sum_{n=1}^{\infty} CAR_p(t_2, t_3) \qquad (6.4)$$

Equation 6.4 shows how announcement returns are aggregated across portfolios to form one cumulative average abnormal return (CAAR). First, by Adding all CAR's together and dividing it by the number of portfolio observations, we obtain the CAAR of our sample. Next, we use the CAAR to determine the statistical significance of announcement returns in section 7.

6.2 Cross-Sectional analysis

After exploring the existence of abnormal announcement returns in rival firms, we use cross-sectional regression analysis to discover if deal and firm-specific characteristics have causal effects on rival CAR. The ordinary least square regression (OLS) allows us to isolate a single variable's impact on the CAR by controlling for other variables that may affect announcement returns. The regression model can formally be derived as follows:

$$CAR_j = \beta_0 + \beta_1 x_{1j} + \cdots + \beta_M x_{Mj} + n_j \qquad (6.5)$$

Equation 6.5 describes the relationship between M characteristics and cumulative abnormal returns. Furthermore, CARj represents the j^{th} cumulative abnormal return of portfolio j. Moreover, x_{mj}, m = 1,…, M, denotes M deal-specific characteristics for the j^{th} portfolio. Similarly, when testing for company-specific differences, we use the same formula except that x_{mj}, m = 1,…, M, now stands for M company-specific characteristics, and CAR_j now represents the cumulative abnormal return of the j^{th} rival. Also, $ß_m$, m = 0,…, M are the regression coefficients. The zero mean disturbance term n_j is uncorrelated with the x's. Heteroskedasticity robust standard errors should be used unless we have good reason to believe the errors are homoscedastic (MacKinley, 1997). Therefore, we use heteroskedasticity robust standard errors in all regression models. As OLS regression is a common methodological tool used in most empirical research, we do not explain it in further detail.

7 Analysis

A prerequisite for the investigation of rival gains is their existence. Therefore, we begin the analysis section by utilizing the event study methodology, exploring the existence of abnormal returns in rivals of Norwegian acquisition targets between 1995-2020. Because the extant literature consistently finds strong evidence of positive rival gains in US equity markets, we expect to observe the same in Norway.

We divide our analysis into two parts. First, we run regressions with portfolio CAR as the response variable and deal-specific variables as explanatory variables on rival returns. Here, we aim to investigate our first hypothesis, which predicts a more positive reaction from equity markets in nonhorizontal acquisitions than horizontal ones. Because our response variable is the returns of a rival portfolio, we cannot include firm-specific explanatory variables.

In the second analysis part, we run cross-sectional regression models with individual CAR as the response variable and both firm-specific and deal-specific explanatory variables. Specifically, we test our second and third hypotheses concerning (2) the competitive position of the rival and (3) their ownership structure. Furthermore, we focus on the firm-specific variables that may explain rival returns but include deal-specific variables as control variables. Finally, we end the analysis sections with a brief summary of our main findings.

7.1 Abnormal Returns Across Portfolios

Our first hypothesis relates to the industry-wide implications of horizontal acquisitions. First, we categorize our sample based on the nature of the acquisition (horizontal vs. non-horizontal) and test for statistical significance in cumulative average abnormal returns (CAAR) of rival portfolios. Next, we report the results across three event windows. Recall that our first hypothesis is:

H1_0: Rivals of targets involved in horizontal M&A activity, on average, ***experience similar*** *returns as target rivals in nonhorizontal transactions.*

H1_1: Rivals of targets involved in horizontal M&A activity, on average, ***experience*** *lower abnormal returns than rivals in nonhorizontal transactions.*

Table 7.1 shows the cumulative average abnormal return of all rival portfolios in our sample. It also reports CAAR across the categories "horizontal" and "non-horizontal". Again, non-horizontal acquisitions are not necessarily vertical, as the non-horizontal subsample includes bids by individuals and financial buyers.

Table 7.1 T-test for Statistical Significance of CAAR

Window	Sample	CAAR	t.stat	N
[-1, 1]	Full Sample	0.0049***	2.6964	163
[-2, 2]	Full Sample	0.0059***	2.9377	163
[-5, 5]	Full Sample	0.0094**	2.1996	163
[-1, 1]	Non-Horizontal	0.0062***	3.0218	111
[-2, 2]	Non-Horizontal	0.0066***	2.6752	111
[-5, 5]	Non-Horizontal	0.0123**	2.1373	111
[-1, 1]	Horizontal	0.0023	0.61707	52
[-2, 2]	Horizontal	0.0045	1.2758	52
[-5, 5]	Horizontal	0.0031	0.59921	52

Note: Two-tailed t-test. *p<0.1; **p<0.05; ***p<0.01

When testing our total sample, we find statistically significant positive abnormal returns across all three event windows. In our main event window of interest (i.e. [-1,1]), announcement returns

are significant at a 1% level. Our results follow the usual relationship found in similar studies[2]. Our results are consistent with both versions of the signalling hypothesis, the market power hypothesis, and the hubris hypothesis. They also contradict the competitive advantage hypothesis.

When separating into subsamples, we find evidence that non-horizontal transactions correlate with positive rival returns. In our main event window, on average, rivals of non-horizontal acquisition targets experience a positive gain of 0.62%. The relationship is significant at a 1% level. We observe the same connection in event windows [-2,2] and [-5,5] at 1% and 5% statistical significance levels, respectively. We find no evidence that horizontal M&A activity has positive spillover effects across any event window. Our evidence contradicts the market power hypothesis, which claims that horizontal acquisitions should experience positive returns and non-horizontal should not. To further examine the potential impact the nature of the bid has on rival returns, we perform a two-sampled independent t-test for the difference in means between the two subsamples.

Table 7.2 T-test for Statistically Significant Difference in Means

Window	Horizontal	Non-Horizontal	Difference	t.stat
[-1, 1]	0.0023	0.0062	0.0039	0.90566
[-2, 2]	0.0045	0.0066	0.0021	0.47464
[-5, 5]	0.0031	0.0123	0.0092	1.1813

Note: Two-tailed t-test. *p<0.1; **p<0.05; ***p<0.01
We utilize a Welch's Two Sample t-test

Table 7.2 presents the results from a two-sampled independent t-test for the difference in means between the two subsamples. We do not find statistical evidence for a difference in means across non-horizontal and horizontal transactions. Thus, we cannot successfully claim that the nature of the bid is a determinant of rival gains. That is, we cannot reject our first null hypothesis.

Because the univariate analysis lacks power, we perform regression analyses to answer our first hypothesis. We report four regression models where our primary explanatory variable of interest is a dummy indicating whether the deal is horizontal or nonhorizontal. Moreover, we use seven

[2] (Eckbo 1993, Walkling & Song, 2000, de Bodt & Roll 2011, Clougherty and Duso 2009, Davis et al. 2021, Akhigbe et al. 2000, Gaur et al. 2013)

other deal-specific variables to control for omitted variable bias. Furthermore, we cluster all deals across industries and decades. We do this because we expect the CAR to vary with industry-specific characteristics (e.g. profitability and concentration). For example, we reckon that the varying degree of competitive intensity across sectors, depending on, e.g., product maturity, will impact rival CAR. Non-identical competitive environments will, if not adjusted for, attribute industry effects to other variables imposing an omitted variable bias on our results. We also adjust for potential time differences by clustering the deals across decades.

Table 7.3 Regression Models – Deal-Specific Variables

	Dependent variable			
	Rival Portfolio CAR			
	(1)	(2)	(3)	(4)
Horizontal	-0.0079*	-0.0080**	-0.0218**	-0.0230**
	(-1.993)	(-2.065)	(-2.080)	(-2.173)
Industry concentration			-0.0004	-0.0005
			(-0.826)	(-0.816)
Horizontal*industry concentration			0.0012*	0.0012*
			(1.701)	(1.698)
Relative deal size	0.0079	0.0061	0.0072	0.0070
	(1.186)	(0.8764)	(0.942)	(0.901)
Target abnormal returns	0.0000	0.0019	0.0020	0.0018
	(-0.001)	(0.208)	(0.223)	(0.208)
Initial industry target		0.0073**	0.0098**	0.0097**
		(2.302)	(2.640)	(2.650)
Foreign acquirer			0.0054**	0.0043**
			(2.244)	(2.063)
Horisontal*foreign acquirer				0.0030
				(0.699)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Clustered SE	Industry	Industry	Industry	Industry
Observations	163	163	163	163
R2	0.47603	0.48894	0.51588	0.51655
Within R2	0.03737	0.06111	0.11059	0.11183

Note: (t-stat); *p<0.1; **p<0.05; ***p<0.01
We apply Robust standard errors, and report associated t-statistics.

In model 1, we include two deal-specific control variables: (1) the logarithm of the relative deal value and (2) a proxy for the bid premium. We find a negative coefficient before the horizontal

deal dummy, although only significant at a 10% level. In our second model, we include a dummy variable capturing whether the rival is an initial industry target (IIT) to proxy for the surprise effect of the acquisition. Interestingly, the statistical significance of the horizontal-dummy variable increases to 5%. Additionally, the IIT dummy proves significant at a 5% level, implying that surprising acquisitions yield positive abnormal returns consistent with both versions of the signalling theory.

In our third model, we introduce three new control variables. First, we add the number of listed firms sharing the same TRBC code as a proxy for industry concentration, controlling for the intensity of industry competition at the time of the deal announcement. Additionally, we include an interaction term between horizontal acquisitions and industry concentration. We hypothesize that a horizontal merger will have more significant negative industry effects for concentrated industries. The interaction term is significant at a 10% level. Finally, we add a dummy capturing the acquirer being a foreign entity. The coefficient for the dummy on foreign acquirers is positively significant at a 5% level.

The fifth model further investigates the relationship between CAR and foreign acquirers. Here, we add an interaction term between the foreign acquirer dummy variable and the horizontal transaction dummy variable. The interaction term is not significant. In other words, we find no evidence suggesting that the positive effect of a foreign buyer is related to the nature of the bid.

7.1.1 Key Explanatory Variables

Horizontal vs. nonhorizontal

Our analysis implies that the bid's nature significantly affects the rival portfolios' CAR. When adjusting for deal-specific factors, the horizontal dummy is significant across all four regression models. In other words, holding everything else equal, our sample suggests that, on average, rivals of target firms involved in horizontal M&A transactions experience lower abnormal returns than rivals in nonhorizontal transactions. Consequently, we can successfully reject our first null hypothesis. Our results are consistent with the competitive advantage hypothesis. Moreover, they fail to support the market power hypothesis, as successful collusion should drive positive abnormal returns in horizontal rivals.

Despite the observed difference in rival returns in horizontal and nonhorizontal transactions, we cannot conclude on underlying drivers causing them. Consistent with our hypothesis

development, our preliminary interpretation is that investors perceive negative competitive effects as more significant in horizontal mergers. Consequently, horizontal rivals experience greater share sell-offs as investors are increasingly anxious that the merger will negatively impact future cash flow. In other words, we believe the competitive advantage hypothesis may cancel out the positive effects of the signalling hypothesis. We investigate this relationship in further detail in section 7.2.

7.1.2 Other control variables of Interest

Horizontal * Industry Concentration

The industry concentration variable is not statistically significant alone. However, interestingly, the interaction term between horizontal and industry concentration is significant at a 10% level. A possible explanation is that investors are less concerned about cash flow effects arising from a stronger competitor in sectors with more competitors. The reason is market players are less interdependent in fragmented industries. Though we find the relationship interesting, the variable is only statistically significant at a 10% level. We are, therefore, cautious in claiming that the relationship described above is absolute. However, when using the market-adjusted model to measure normal performance, the significance of the interaction term becomes significant at a 5% level. Finally, changing the normal performance model also makes the industry concentration variable positive and significant at a 1% level. This contradicts the idea that more rivals are associated with lower takeover probability, thus lower rival returns.

Target abnormal returns

To our surprise, our proxy for the bid premium is not statistically significant. We argued that because the bid premium reflects the acquirer's perceived synergy potential, larger premiums provide an apparent signalling effect. One potential explanation for its insignificance is that our proxy does not appropriately capture the bid premium. As previously pointed out, we systematically underestimate the bid premium. Alternatively, the rivals in our sample do not possess the same firm-specific traits that made the initial target attractive. Consequently, investors may not allocate a higher acquisition probability to them. However, because the intended use of the variable is to control for omitted variable bias, we do not discuss its insignificance any further.

Initial Industry Target (IIT)

The dummy variable for the initial industry target is statistically significant at a 5% level in models two to four. Our results are consistent with previous findings that signalling effects generate positive returns in rival firms. However, we cannot conclude if the average gain of 0.73% is associated with industry growth signals or an increased probability of becoming a subsequent target. Investigation of this relationship is beyond the scope of our thesis. However, a general interpretation is that investors are positively surprised about the acquirer's interest in the industry, making them increasingly optimistic that rivals will generate higher cash flows or become future acquisition targets.

Foreign Acquirer

Our third and fourth regression models show that cross-border M&A activity has significant explanatory power on rival CAR at a 5% confidence level. The positive sign of the coefficient indicates that the rival gains more when the acquirer is a foreign entity. This contradicts the market power hypothesis, which suggests that rivals should gain less from foreign acquirers because the industry participant count remains unchanged. Next, we previously argued that interest from large multinational entities or asset managers could yield stronger signalling effects than from domestic players. Investors perceiving more international players as potential bidders than initially assumed may explain the positive returns. Alternatively, their interest in the industry could signal increased industry growth expectations. Again, we cannot discriminate between the types of signaling effects, but note that the results are consistent with both versions of the signaling hypothesis.

However, the relationship does not persist when excluding periods of financial turbulence. This could suggest that the effect is specific to periods characterized by uncertainty and volatility. For example, investors may find it reassuring that a foreign acquirer engages in industries experiencing difficulties (e.g., oil services in 2014/2015). Because our main reason for including the variable is to control for omitted variable bias, we do not discuss it in further detail.

Foreign Acquirer * Horizontal.

We previously argued that because foreign acquirers have likely already experienced domestic success, their entrance into the Norwegian market should negatively impact rival returns. This effect should be particularly strong in horizontal transactions, as the foreign acquirer may initiate aggressive growth strategies. However, surprisingly, we find no evidence that this relationship

exists as the interaction term is insignificant. One potential reason could be that the earnings of many of the firms listed on the OSEAX are linked to commodity prices (e.g., oil, gas, salmon) or freight rights, making them less interdependent. Additional discussion of the variable's insignificance is beyond this thesis's scope.

7.1.3 Summary of Portfolio Findings

On average, Norwegian rival firms earn positive abnormal returns following acquisition announcements. Furthermore, on average, rivals in horizontal transactions obtain lower announcement returns than nonhorizontal ones. Thus, we successfully reject our first null hypothesis. Our preliminary interpretation is that the lower announcement returns are linked to increased fears of cash flow erosion in horizontal acquisitions. Consequently, negative cash flow effects may cancel out positive signalling effects from increased acquisition probability or industry growth expectations.

Moreover, we find evidence that surprising acquisitions yield greater rival returns. Our results are consistent with the extant literature, suggesting that the reason is that these transactions generate more significant signalling effects. Finally, on average, rival firms earn greater abnormal returns when the acquirer is foreign. A possible interpretation is that the signalling effect is more prominent when the acquirer is a foreign entity. Contradicting our expectations, the interaction term between horizontal and foreign acquirer is insignificant. In other words, investors seemingly do not fear that the risk of cash flow erosion from a foreign acquirer is greater when the merging firms operate in the same industry.

7.2 Cross-Sectional Analysis of Rival Returns

Our second and third hypotheses relate to firm-specific characteristics that may impact target rivals' announcement returns. We cluster variables across industries and decades before testing the statistical significance of individual rivals' CAR in the event period [-1,1]. We test both hypotheses related to firm-specific variables in the same regression framework presented in Table 7.4. Recall that we hypothesise the following:

H2_0: In horizontal acquisitions, rivals enjoying larger market shares or superior profitability experience ***similar*** *announcement returns as rivals with weaker competitive positions.*

*H2_1: In horizontal acquisitions, rivals enjoying larger market shares or superior profitability experience **higher** announcement returns than rivals in weaker competitive positions.*

---

*H3_0: Rivals with concentrated ownership structures experience **similar** announcement returns as rivals with fragmented ownership structures.*

*H3_1: Rivals with concentrated ownership structures experience **higher** announcement returns than rivals with fragmented ownership structures.*

Table 7.4 presents seven regression models investigating the relationship between individual rival CAR and firm-specific variables. Although not included in the regression output, all control variables from the deal-specific analysis are included in the regression models. The complete regression output can be found in Appendix A2.1. Moreover, we have included a dummy variable capturing the nature of the bid to observe if the negative coefficient of the horizontal dummy persists when changing the response variable from portfolio CAR to individual rival CAR.

Table 7.4 Regression Models - Firm-Specific Variables

	Dependent variable						
	Rival Firm CAR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Horizontal	-0.0396**	-0.0395**	-0.0394***	-0.0395**	-0.0390**	-0.0373**	-0.0390**
	(-2.676)	(-2.676)	(-3.205)	(-2.663)	(-2.639)	(-2.492)	(-2.626)
EBITDA Margin	0.0027***	0.0028***	0.0028***	0.0027***	0.0026***	0.0026***	0.0027***
	(3.091)	(3.102)	(3.151)	(3.078)	(3.012)	(2.931)	(3.049)
EBITDA Margin*Horizontal	-0.0006	-0.0005	-0.0005	-0.0006	-0.0004	-0.0004	-0.0003
	(-0.2251)	(-0.2109)	(-0.2013)	(-0.2209)	(-0.1555)	(-0.1605)	(-0.1173)
Market share	-0.0063	-0.0064	-0.0064	-0.0063	-0.0057	-0.0055	-0.0060
	(-0.6486)	(-0.6625)	(-0.6585)	(-0.6502)	(-0.5977)	(-0.5807)	(-0.6325)
Market share*Horizontal	0.0357***	0.0361***	0.0361***	0.0357***	0.0343***	0.0343***	0.0375***
	(3.124)	(3.127)	(3.113)	(3.121)	(2.980)	(2.986)	(3.004)
SQRT(% of shares held by largest shareholder)		-0.0035	-0.0034				
		(-0.8965)	(-0.6077)				
SQRT(% of shares held by largest shareholder)*Horizontal			-0.0004				
			(-0.0240)				
SQRT(HHI ownership)				-0.0002			
				(-0.0523)			
SQRT(HHI ownership)*Horizontal				-0.0004			
				(-0.0295)			
Blockholder (10%)					0.0042*	0.0051	
					(1.784)	(1.608)	
Blockholder (10%)*Horizontal						-0.0022	
						(-0.3309)	
Blockholder (33.4%)							-0.0009
							(-0.5408)
Blockholder (33.4%)*Horizontal							-0.0064
							(-1.215)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE by:	Industry	Industry	Industry	Industry	Industry	Industry	Industry
Observations	987	987	987	987	987	987	987
R2	0.08778	0.08805	0.08805	0.08778	0.08911	0.08920	0.09040
Within R2	0.03187	0.03216	0.03216	0.03892	0.03328	0.03338	0.03465

Note: (t-stat); *p<0.1; **p<0.05; ***p<0.01

We apply Robust standard errors, and report associated t-statistics.

7.2.1 Key Explanatory Variables

Horizontal vs. nonhorizontal

The horizontal dummy remains significant at a 5% level in the cross-sectional analysis, implying that, on average, rivals in horizontal acquisitions obtain lower announcement returns. The persisting relationship enforces our confidence in rejecting our first null hypothesis.

Market share * Horizontal

The interaction term between market share and the horizontal dummy remains significant at a 1% level across all seven models. In other words, investors seemingly appreciate rivals with a solid competitive position following industry merger announcements. Interestingly, however, the standalone market share variable is insignificant. In other words, we find no evidence that rival market share impacts the investor's decision to acquire or sell rival shares when including horizontal and nonhorizontal acquisitions. These results follow our expectations. First, we argued that a high market share is associated with a lower probability of becoming a future target, meaning that neither horizontal nor nonhorizontal rivals should gain from increased acquisition probability. Next, we argued that because horizontal acquisitions are more likely to impact rivals' future ability to generate cash flow negatively, a high market share should positively impact rival returns in horizontal acquisitions. These results support our interpretation of why horizontal acquisitions yield lower announcement returns than nonhorizontal acquisitions.

EBITDA margin * Horizontal

We use the EBITDA margin as a second proxy for assessing the rival's competitive position. Because better operational performance should coincide with competitive resilience, we expected the coefficient of the interaction term between EBITDA margin and horizontal acquisitions to be statistically significant and positive. However, the variable is insignificant across all models, implying that higher EBITDA margins do not mute fears of cash flow erosion among rivals in horizontal acquisitions.

Interestingly, however, the standalone EBITDA margin variable is statistically significant and positive across all models at a 1% level. In other words, investors prefer rivals with solid operational performance following merger announcements. The results are the opposite of what we expected, as we previously argued that a high EBITDA margin is typically associated with a lower takeover likelihood. Nonetheless, as the extant literature sometimes finds that EBITDA margin is positively associated with takeover probability, this could be the case. Alternatively, the market may expect that firms with high EBITDA margins are better positioned to benefit from industry growth.

Herfindahl Hirschman index (HHI)

We previously referred to extant literature suggesting that increased ownership concentration is associated with a higher probability of engaging in future M&A activity. The likelihood of rivals

becoming future targets could increase in both non-horizontal and horizontal deals. Hence, if the ownership structure captures deal probability, it should impact all rivals in the total sample. However, the HHI index is not statistically significant in our models, implying that investors don't allocate higher acquisition probability to rivals with high ownership concentration. A possible interpretation is that investors do not consider ownership structures relevant unless major shareholders that are reluctant to sell their shares exist.

Blockholder holding 10%

We previously argued that, if significant, a blockholder holding 10% or more of outstanding shares should negatively impact takeover probability. Our argument comes from the fact that a blockholder owning 10% of the shares may block a squeeze-out, which increases transaction risk for the acquirer. The dummy variable is significant at a 10% level with a positive coefficient. However, the variable's significance does not persist in our robustness checks (i.e. change of normal performance model and exclusion of periods of financial turbulence). Thus, we refrain from discussing it in further detail.

Interestingly, the interaction between the "blockholder 10%" and "horizontal" is insignificant. Although we argued that the absence of a blockholder with 10% could indicate poor governance and lack of financial resources, which could impact rival returns negatively, we find no support for this proposition.

Blockholder holding 33%

A blockholder holding 33% is more likely to be a government entity, a parent company, a family business, or a wealthy individual. Because the extant literature finds that these ownership groups are generally more reluctant to sell their shares, we expected the variable to be statistically significant with a negative coefficient. However, surprisingly, we find no evidence of our conjecture, despite the theoretical connection between stockholders of considerable size and lower takeover probability.

We also argued that the existence of a blockholder could be positive in horizontal acquisitions. The argument follows the same logic for a blockholder holding a 10% shareholding. Moreover, firms with stockholders owning 33% may have even better governance and financial capacity than rivals with a blockholder holding 10%, as larger owners have more significant incentives to monitor management. Initially, one might argue that the positive impact of better governance

and financial capacity cancels the negative effect of lower takeover probability. However, the interaction term between "blockholder 33%" and "horizontal" is also insignificant. Thus, we find no evidence that the existence of a large owner mitigates fears that the rival will experience cash flow erosion from increased competition.

7.2.2 Other control variables of Interest

Current ratio

Some evidence suggests that poor liquidity is associated with higher takeover probability, as the company cannot capitalize on attractive investment opportunities. Moreover, poor liquidity may be related to a higher takeover probability as the rival may engage in M&A to survive the changes in the competitive environment. Nonetheless, similar to all other firm-specific control variables, the current ratio is insignificant in explaining rival returns. Negative cash flow effects from increased competition may cancel a positive takeover likelihood effect. This follows the idea that rivals with poor liquidity are more vulnerable to increased competition. However, given the variable's insignificance, we do not discuss it further.

7.2.3 Summary of Individual Findings

Our total sample does not show that market share has explanatory power on rival returns. However, the market share seemingly positively impacts rival returns in horizontal transactions. The results follow our hypothesis that rivals in horizontal transactions gain less because of increased competition, as a higher market share coincides with greater competitive resilience. Moreover, the EBITDA margin is significant across the total sample. The results contradict our impression that rivals characterized by poor operational performance are likelier to be acquired. Furthermore, our theory that the positive returns may be explained by investors perceiving operationally efficient rivals as less likely to experience cash flow erosion from the merger is generally rejected. The reason is that the interaction between the horizontal dummy and EBITDA margin is insignificant. Consequently, we cannot successfully reject our second null hypothesis.

Next, none of our four proxies for ownership concentration are statistically significant. Therefore, ownership structure seemingly does not impact takeover probability nor contribute to increased confidence in the firm's ability to compete following the merger. Overall, the

insignificance of all proxies means we cannot reject our third null hypothesis. In other words, we find no evidence that higher ownership concentration is associated with higher announcement returns.

Finally, the horizontal vs. nonhorizontal dummy remains significant when using each rival's individual cumulative abnormal return instead of rival portfolios' cumulative abnormal return. Thus, we remain confident that we can reject our first null hypothesis.

8 Robustness

In this section, perform a robustness check of our analyses. Because our analyses are based on our calculated abnormal returns in rivals, we consider a robustness check of their existence critical in claiming our results' validity. Consequently, we start by replacing the market model with the market-adjusted model to measure normal performance. Secondly, we rerun all models presented in section 7, excluding periods of financial turbulence. Next, we discuss our handling of potential issues related to multicollinearity, heteroscedasticity, and autocorrelation. Finally, we discuss potential problems of the misspecification of the models and control for it through a RESET test.

8.1 Change of Normal Performance Model

To begin our robustness check, we estimate rival announcement returns using the market-adjusted model instead of the market model. As a result, we obtain new announcement returns for each rival in the event window [-1,1]. Next, we run the regression models presented in section 7 on the CARs estimated by the new model. Changing the normal performance model does not alter our results significantly apart from what we outline in section 7. Moreover, it does not influence our hypothesis rejection. To conclude, we gain confidence that our results are robust. The results from the alternative models can be found in Appendix A3.1 and A3.2.

8.2 Exclusion of Periods of Financial Turbulence

Section 5.3 points out that our sample shows high merger activity in 2008 and 2014. As a reminder, we argue that including transaction activity during periods of financial turmoil may impact the validity of our results. As the acquisition announcements during these periods constitute ~18% of our total sample, we consider running robustness checks on our results necessary. Accordingly, we perform identical OLS regressions as those presented in section 7, excluding merger activity in the periods 01.09.2008 - 01.09.2009 and 20.06.2014 - 20.06.2016. By excluding these periods, we aim to separate transaction activity during the financial crisis in 2008 and the oil-price plunge in 2014 from normal market conditions. Excluding these periods does not alter our results significantly apart from what we outline in section 7. Nor does it change our hypothesis rejection. The results from the alternative models can be found in Appendix A3.3. and A3.4.

8.3 Adjustments for Multicollinearity, Heteroscedasticity, and Autocorrelation

8.3.1 Multicollinearity

Multicollinearity is a statistical phenomenon that occurs when two or more independent variables in a regression model are highly correlated. It leads to imprecise and unreliable estimates of the relationship between each independent and dependent variable. Therefore, it must be adjusted for (Stock & Watson, 2020). We perform variance inflation factor (VIF) tests on all independent variables used in our regression specifications to evaluate if our models suffer from multicollinearity. A generally accepted rule is that a VIF value above ten is problematic. (James et al., 2013). Our VIF tests show that all independent variables have variance inflation factors below this threshold. Thus, we do not take any specific measures to adjust for multicollinearity. We report the associated VIF value of each explanatory variable in Appendix A3.5 and A3.6.

8.3.2 Heteroskedasticity and Correlation of the Error Term

Heteroskedasticity describes a situation where the estimator's variance is dependent on the value it takes. In other words, the variance of the difference between the predicted value of the estimator and the actual value is not constant. As a result, the t-statistic does not follow a t-distribution, and thus, one risks rejecting the null hypothesis too often or not rejecting it often enough. As communicated in section 6.2, one should have strong reason to believe that the estimators are homoscedastic to not adjust for heteroscedasticity. Because we have no reason to think that the variances in our independent variables are constant, we apply heteroscedasticity robust standard errors in all of our models.

The correlation of the error term refers to the degree of correlation between the errors of the regression model. If the errors correlate with each other, it may indicate an omitted variable bias, which would lead to biased estimates. We sample our rival return observations by connecting targets and rivals sharing the same TRBC code. If the sample selection process is biased, it may cause a correlation between the error term and explanatory variable(s). To control for correlation of the error term, we apply clustered standard errors that are heteroskedasticity- and correlation-robust in all our models (Stock & Watson, 2020).

8.4 Misspecification and Omitted Variable Bias

Insufficient use of control variables may result in omitted variable bias. Omitted variable bias is caused by not including a determinant of the response variable (y), which correlates with an included explanatory variable (x). Thus, the effect of the omitted variable on y will be attributed to the included variable x. In other words, a model suffering from misspecification will suggest that false relationships exist. We perform a regression equation specification error test (RESET) of all regression models to test our models for misspecification leading to omitted variable bias. Our testing shows that no models suffer from misspecification. The test results can be found in Appendix A3.7 and A3.8.

Omitted variables that vary significantly across industries will likely yield biased coefficients. If not controlled for, our explanatory variables risk capturing systematic differences across sectors and attributing them to specific variables. Therefore, we have included an industry dummy variable in all our regression models to control for differences in industry characteristics. Finally, systematic differences could exist between decades. Because our sample covers a 25-year time interval, we include a dummy variable for each decade (i.e. 1995-2000, 2000-2010, and 2010-2020)

9. Conclusion

In this thesis, we investigate how the stock prices of rivals of Norwegian acquisition targets react to merger announcements. The phenomenon of positive rival gains is well established in literature; however, their origin remains subject to debate. Previous studies have primarily focused on North American equity markets, so we provide novelty by investigating a market with several different characteristics. Moreover, we focus on differences in rival gains between horizontal and nonhorizontal acquisitions to better understand if investors fear that rivals will experience cash flow erosion because of the merger. This is done by developing and testing a new implication of the competitive advantage hypothesis. Finally, ownership structure has, to our knowledge, not been included in analyses attempting to explain cross-sectional variation in rival returns. As ownership structure, in theory, may very well impact rival returns, we find that its previous omission is likely because of a lack of ownership data. We add to this loophole in the extant literature by including four proxies on ownership structure when investigating sources of rival gains.

A prerequisite for the investigation of rival gains is their existence. Therefore, we begin the analysis section by utilizing the event study methodology to explore the existence of abnormal returns in rivals of Norwegian acquisition targets between 1995-2020. We find that Norwegian rivals, on average, experience a positive gain of 0.49% following acquisition announcements. The relationship is statistically significant at a 1% level and persists across all event windows (i.e. [-1,1], [-2,2],[-5,5]). Our results are consistent with similar research performed in other geographical regions. To investigate sources of rival gains, we develop three hypotheses related to (1) the nature of the bid, (2) the competitive position of the rival, and (3) the rival's ownership structure.

First, we hypothesize that rivals in transactions where the bidder and target are competitors will gain less than rivals where the merger insiders are unrelated or operate in different parts of the value chain. Our conjecture stems from the assumption that the synergies generated by a horizontal merger are more likely to hurt rivals' future ability to generate cash flow. Also, they are generally more apparent to investors due to the operational overlap of the merging firms. We find that horizontal acquisitions, on average, yield lower announcement returns in rivals. This holds across both regression analyses, where we use rival portfolio returns and individual rival returns as the dependent variable. Thus, we successfully reject our first null hypothesis.

Secondly, we hypothesize that rivals with a strong market position will yield higher announcement returns as they are more resistant to changes in the competitive environment. We use the rivals' market share and EBITDA margin as proxies for their competitive position. Our findings suggest that market share positively impacts rival returns in horizontal acquisitions but not in the total sample. This is likely because a high market share mitigates the risk of cash flow erosion but decreases the probability of becoming a subsequent target. The EBITDA margin does not significantly influence rival returns in horizontal acquisitions but positively affects the total sample. This implies that a higher EBITDA margin is associated with higher acquisition probability, contradicting our expectations. Moreover, it fails to support the idea that higher EBITDA margins are associated with a lower risk of cash flow erosion in rival firms. Thus, we fail to reject our second null hypothesis.

Finally, we hypothesize that rivals with more concentrated ownership structures will experience higher announcement returns. This is mainly because firms with higher ownership concentration are easier to acquire, lowering transaction risk for the acquirer. We use four proxies for

ownership concentration: (1) % shares held by the largest shareholder, (2) the HHI-index for ownership concentration, (3) a dummy variable for a blockholder owning 10% and (4) a dummy variable for a blockholder owning 33%. Although rivals should generally benefit from higher ownership concentration, the existence of blockholders may impact future acquisition probability negatively. This is because a blockholder owning 10% may block a squeeze out (i.e. increased transaction risk), and a blockholder owning 33% of outstanding shares likely fit into ownership categories less likely to tender their shares (e.g., governments, parent companies, wealthy individuals). Moreover, a large blockholder may be an internal governance mechanism, meaning the need for a disciplinary merger is lower. However, none of our four proxies are significant, implying that ownership structure is irrelevant in investors' decisions to buy or sell rival shares following acquisition announcements. Interestingly, this suggests that ownership structure does not impact rival takeover likelihood.

We also argued that blockholders might positively impact horizontal acquisitions as they may mitigate fears of cash flow erosion. This is because a blockholder could be associated with increased competitive resilience as they may offer increased financial capacity and have greater incentives to force a response from management. However, we find no evidence that blockholders positively impact rival returns in horizontal acquisitions.

Finally, we include multiple control variables in our regression analyses, adding to our understanding of rival gains beyond our core findings. First, surprising acquisitions yield higher announcement returns, consistent with the acquisition probability and industry growth hypotheses. In other words, we find evidence that information effects are a likely source to rival gains. Moreover, we find that rivals gain more when the acquirer is foreign. This could be because a foreign acquirer produces more significant signalling effects from more potential acquirers or greater industry growth expectations. The relationship does, however, not persist when excluding periods characterized by financial turbulence, which may imply that foreign acquirers only positively impact rival returns when visibility is poor, and markets are volatile. Finally, we find no evidence that variables associated with higher takeover probability (i.e. poor liquidity, low valuation) help explain rival returns apart from size. This contradicts the acquisition probability hypothesis. Thus, we find it likely that industry growth expectations primarily drive rival gains in Norwegian equity markets.

Overall, in line with previous research, we conclude that equity markets, on average, consider merger activity as positive for rivals of acquisition targets. Moreover, we reject the market power hypothesis as we find evidence of nonhorizontal rival gains. Also, we find evidence for the signalling hypothesis but cannot confidently discriminate between the acquisition probability hypothesis and the industry growth hypothesis. However, our results favour the industry growth hypothesis over the acquisition probability hypothesis, as variables associated with higher takeover likelihood are insignificant. Finally, we find partial evidence for the competitive advantage hypothesis, as market share positively impacts rival returns in horizontal acquisitions but not in the total sample. However, in post-merger competitive environments, the notion of "survival of the fittest" falls short of capturing the equity market's perception of future winners and losers.

Appendix

A1: Hypotheses Literature Overview

Table A1.1 Hypotheses Literature Overview

Theory	Hypothesized abnormal returns to industry rivals	Studies
(1) Collusion/market power hypothesis	Higher abnormal returns should occur in more concentrated industries as oligopolistic effects are intensified when the number of industry competitors is reduced (Eckbo, 1983)	**Supporting:** Akhavein et al. (1997); Barton and Sherman (1984); Bhattacharyya and Nain (2011); Borenstein (1990); Kim and Singal (1993); Prager and Hannan (1998); Singal (1996) **Rejecting:** Akhigbe et al. (2000); Becher et al. (2012); Eckbo (1985); Eckbo (1992); Eckbo and Wier (1985); Gaur et al. (2013); Song and Walkling (2000); Stillman (1983)
(2) Competitive advantage/synergy hypothesis	Assuming rivals are not capable of adopting cost-efficient innovations (synergies) themselves, merger announcements negatively impact rival returns due to comparative disadvantages (Chatterjee, 1986)	**Supporting:** Chatterjee (1986) **Rejecting:** Akhigbe et al. (2000)
(3) Signaling hypothesis: acquisition probability	Proposed mergers positively impact rival returns if they reveal innovations that would allow rivals to similarly replicate efficiencies, but only upon being acquired (Song & Walkling, 2000)	**Supporting:** Akhigbe et al. (2000; 2007); Becher et al. (2012); Cai et al. (2011); Otchere and Ip (2006); Song and Walkling (2000) **Rejecting:** Clougherty and Duso (2009); Gaur et al. (2013)
(4) Signaling hypothesis: industry growth	Proposed mergers positively impact rival returns if they reveal innovations that would allow rivals to similarly replicate efficiencies, without requiring an acquisition (Bradley et al., 1988; Eckbo, 1983)	**Supporting:** Gaur et al. (2013) **Rejecting:** Akhigbe et al. (2000)
(5) Hubris hypothesis	Overconfident bidders engage in value-destroying mergers, generating competitive opportunities for rivals. Merger announcements are therefore associated with positive rival-firm returns (Roll, 1986)	**Supporting:** Billett and Qian (2008); Roll (1986) **Rejecting:** Gaur et al. (2013)

Appendix 2 Full OLS Regression specifications

Table A2.1 Full OLS Regression specifications and results of models presented in Table 7.4

	Dependent variable						
	Rival Firm CAR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Horizontal	-0.0396**	-0.0395**	-0.0394***	-0.0395**	-0.0390**	-0.0373**	-0.0390**
	(-2.676)	(-2.676)	(-3.205)	(-2.663)	(-2.639)	(-2.492)	(-2.626)
EBITDA Margin	0.0027***	0.0028***	0.0028***	0.0027***	0.0026***	0.0026***	0.0027***
	(3.091)	(3.102)	(3.151)	(3.078)	(3.012)	(2.931)	(3.049)
EBITDA Margin*Horizontal	-0.0006	-0.0005	-0.0005	-0.0006	-0.0004	-0.0004	-0.0003
	(-0.2251)	(-0.2109)	(-0.2013)	(-0.2209)	(-0.1555)	(-0.1605)	(-0.1173)
Market share	-0.0063	-0.0064	-0.0064	-0.0063	-0.0057	-0.0055	-0.0060
	(-0.6486)	(-0.6625)	(-0.6585)	(-0.6502)	(-0.5977)	(-0.5807)	(-0.6325)
Market share*Horizontal	0.0357***	0.0361***	0.0361***	0.0357***	0.0343***	0.0343***	0.0375***
	(3.124)	(3.127)	(3.113)	(3.121)	(2.980)	(2.986)	(3.004)
SQRT(% of shares held by largest shareholder)		-0.0035	-0.0034				
		(-0.8965)	(-0.6077)				
SQRT(% of shares held by largest shareholder)*Horizontal			-0.0004				
			(-0.0240)				
SQRT(HHI ownership)				-0.0002			
				(-0.0523)			
SQRT(HHI ownership)*Horizontal				-0.0004			
				(-0.0295)			
Blockholder (10%)					0.0042*	0.0051	
					(1.784)	(1.608)	
Blockholder (10%)*Horizontal						-0.0022	
						(-0.3309)	
Blockholder (33.4%)							-0.0009
							(-0.5408)
Blockholder (33.4%)*Horizontal							-0.0064
							(-1.215)
SQRT(D/E)	0.0034***	0.0035***	0.0035***	0.0034***	0.0033***	0.0032***	0.0035***
	(4.204)	(4.254)	(4.413)	(4.135)	(3.958)	(4.027)	(4.457)
Current ratio	-0.0002	-0.0003	-0.0003	-0.0003	-0.0003	-0.0003	-0.0003
	(-0.7642)	(-0.8696)	(-0.9090)	(-0.8209)	(-0.7731)	(-0.7595)	(-0.9210)
Tobin's Q	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011
	(0.9411)	(0.9567)	(0.9806)	(0.9781)	(0.9243)	(0.8968)	(0.8880)
Industry concentration	-0.0020	-0.0020	-0.0020	-0.0020	-0.0018	-0.0018	-0.0021
	(-0.9546)	(-0.9177)	(-0.9481)	(-0.9752)	(-0.8745)	(-0.8675)	(-1.000)
Horizontal*industry concentration	0.0090**	0.0090**	0.0090**	0.0090**	0.0089**	0.0090**	0.0095**
	(2.350)	(2.338)	(2.230)	(2.238)	(2.320)	(2.307)	(2.327)
Initial industry target	0.0096***	0.0096***	0.0096***	0.0096***	0.0095***	0.0095***	0.0098***
	(3.083)	(3.070)	(2.950)	(2.945)	(3.136)	(3.145)	(3.034)
Foreign acquirer	0.0063**	0.0063**	0.0063***	0.0063***	0.0064**	0.0064**	0.0061**
	(3.494)	(3.524)	(3.617)	(3.605)	(3.534)	(3.486)	(3.426)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE by:	Industry	Industry	Industry	Industry	Industry	Industry	Industry
Observations	987	987	987	987	987	987	987
R2	0.08778	0.08805	0.08805	0.08778	0.08911	0.08920	0.09040
Within R2	0.03187	0.03216	0.03216	0.03892	0.03328	0.03338	0.03465

Note: (t-stat); *p<0.1; **p<0.05; ***p<0.01
We apply Robust standard errors, and report associated t-statistics.

Appendix 3 Model Robustness – Regression Variables and Omitted Variable Biases

Table A3.1 Regression models – Deal Specific Variables With CAR Obtained Using Market Adjusted Model

	Dependent variable			
	Rival Portfolio CAR			
	(1)	(2)	(3)	(4)
Horizontal	-0.0101**	-0.0102**	-0.0273***	-0.0293***
	(-2.435)	(-2.456)	(-2.993)	(-3.009)
Industry concentration			-0.0010***	-0.0010***
			(-2.800)	(-2.858)
Horizontal*industry concentration			0.0016**	0.0016**
			(2.504)	(2.497)
Relative deal size	0.0100	0.0095	0.0062	0.0067
	(0.9782)	(1.031)	(0.7202)	(0.8041)
Target abnormal returns	0.0011	0.0022	0.0026	0.0024
	(0.1140)	(0.2037)	(0.2390)	(0.2126)
Initial industry target		0.0081	0.0127**	0.0126**
		(1.566)	(2.317)	(2.308)
Foreign acquirer			0.0122***	0.0106**
			(3.306)	(2.226)
Horisontal*foreign acquirer				0.0045
				(0.5477)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Clustered SE	Industry	Industry	Industry	Industry
Observations	163	163	163	163
R2	0.30394	0.31802	0.38522	0.38652
Within R2	0.03817	0.05762	0.15049	0.15228

Table A3.2 Regression Models - Firm-Specific Variables With CAR Obtained Using Market-Adjusted Model

	Dependent variable						
	Rival Firm CAR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Horizontal	-0.0412**	-0.0411**	-0.0273*	-0.0329*	-0.0409**	-0.0335*	-0.0393**
	(-2.172)	(-2.166)	(-1.837)	(-1.998)	(-2.166)	(-1.752)	(-2.133)
EBITDA Margin	0.0039***	0.0039***	0.0037**	0.0038**	0.0039***	0.0037**	0.0037***
	(2.826)	(2.737)	(2.625)	(2.693)	(2.760)	(2.690)	(2.715)
EBITDA Margin*Horizontal	2.14e-5	4.79e-5	0.0006	0.0007	0.0001	9.83e-5	0.0008
	(0.0074)	(0.0167)	(0.1937)	(0.2309)	(0.0438)	(0.0336)	(0.2859)
Market share	0.0008	0.0008	0.0015	0.0015	0.0012	0.0022	0.0008
	(0.0973)	(0.0877)	(0.1727)	(0.1719)	(0.1413)	(0.2566)	(0.0886)
Market share*Horizontal	0.0288**	0.0290**	0.0295**	0.0286**	0.0278**	0.0279**	0.0316**
	(2.223)	(2.202)	(2.187)	(2.188)	(2.110)	(2.145)	(2.152)
SQRT(% of shares held by largest shareholder)		-0.0018	0.0078				
		(-0.2866)	(0.9396)				
SQRT(% of shares held by largest shareholder)*Horizontal			-0.0292				
			(-1.517)				
SQRT(HHI ownership)				0.0065			
				(0.9939)			
SQRT(HHI ownership)*Horizontal				-0.0266*			
				(-1.746)			
Blockholder (10%)					0.0027	0.0066	
					(0.7563)	(1.184)	
Blockholder (10%)*Horizontal						-0.0095	
						(-1.148)	
Blockholder (33.4%)							0.0034
							(1.339)
Blockholder (33.4%)*Horizontal							-0.0123*
							(-1.895)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE by:	Industry	Industry	Industry	Industry	Industry	Industry	Industry
Observations	987	987	987	987	987	987	987
R2	0.08680	0.08686	0.09045	0.09039	0.08724	0.08862	0.08910
Within R2	0.03004	0.03010	0.03391	0.03385	0.03050	0.03197	0.03419

Note: (t-stat); *p<0.1; **p<0.05; ***p<0.01

We apply Robust standard errors, and report associated t-statistics.

Table A3.3 Regression Models – Deal-Specific Variables Excluding 2008 Financial Crisis and 2014 Oil Crash

	Dependent variable			
	Rival Portfolio CAR			
	(1)	(2)	(3)	(4)
Horizontal	-0.0070*	-0.0065	-0.0221**	-0.0222**
	(-1.739)	(-1.689)	(-2.159)	(-2.198)
Industry concentration			-0.0004	-0.0004
			(-0.6170)	(-0.6096)
Horizontal*industry concentration			0.0013*	0.0013*
			(1.830)	(1.811)
Relative deal size	-0.0006	-0.0009	0.0005	0.0005
	(-0.0703)	(-0.1135)	(0.0550)	(0.0520)
Target abnormal returns	0.0083	0.0096	0.0119	0.0119
	(0.9828)	(1.078)	(1.354)	(1.303)
Initial industry target		0.0085***	0.0107***	0.0107***
		(2.943)	(3.028)	(2.997)
Foreign acquirer			0.0037	0.0036
			(1.269)	(1.103)
Horisontal*foreign acquirer				0.0003
				(0.0573)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Clustered SE	Industry	Industry	Industry	Industry
Observations	140	140	140	140
R2	0.46249	0.48167	0.50868	0.50868
Within R2	0.03180	0.06635	0.11500	0.11501

Note: (t-stat); *p<0.1; **p<0.05; ***p<0.01

We apply Robust standard errors, and report associated t-statistics.

Table A3.4 Regression Models - Firm-Specific Variables Excluding 2008 Financial Crisis and 2014 Oil Crash

	Dependent variable						
	Rival Firm CAR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Horizontal	-0.0446**	-0.0444**	-0.0435***	-0.0432**	-0.0441**	-0.0428**	-0.0437**
	(-2.554)	(-2.536)	(-2.963)	(-2.701)	(-2.517)	(-2.448)	(-2.500)
EBITDA Margin	0.0025**	0.0026***	0.0025***	0.0025***	0.0024**	0.0024**	0.0025***
	(2.687)	(2.726)	(2.821)	(2.749)	(2.649)	(2.600)	(2.721)
EBITDA Margin*Horizontal	-0.0004	-0.0003	-0.0003	-0.0002	-0.0002	-0.0002	0.0001
	(-0.1364)	(-0.1073)	(-0.0925)	(-0.0889)	(-0.0635)	(-0.0679)	(0.0504)
Market share	-0.0053	-0.0054	-0.0054	-0.0053	-0.0046	-0.0044	-0.0050
	(-0.6145)	(-0.6297)	(-0.6269)	(-0.6121)	(-0.5307)	(-0.5123)	(-0.5817)
Market share*Horizontal	0.0362***	0.0366***	0.0367***	0.0362***	0.0342***	0.0342***	0.0379***
	(3.234)	(3.249)	(3.196)	(3.217)	(3.003)	(3.009)	(3.038)
SQRT(% of shares held by largest shareholder)		-0.0042	-0.0036				
		(-0.9441)	(-0.6584)				
SQRT(% of shares held by largest shareholder)*Horizontal			-0.0018				
			(-0.1293)				
SQRT(HHI ownership)				0.0003			
				(0.0708)			
SQRT(HHI ownership)*Horizontal				-0.0041			
				(-0.3593)			
Blockholder (10%)					0.0052*	0.0059	
					(1.947)	(1.683)	
Blockholder (10%)*Horizontal						-0.0016	
						(-0.2463)	
Negative control							-0.0015
							(-0.9166)
Negative control*Horizontal							-0.0065
							(-1.310)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE by:	Industry	Industry	Industry	Industry	Industry	Industry	Industry
Observations	906	906	906	906	906	906	906
R2	0.08680	0.08686	0.09045	0.09039	0.08724	0.08862	0.08910
Within R2	0.03004	0.03010	0.03391	0.03385	0.03050	0.03197	0.03419

Note: (t-stat); *p<0.1; **p<0.05; ***p<0.01

We apply Robust standard errors, and report associated t-statistics.

Table A3.5 Variance Inflation Factors for Regression Models – Deal-Specific Variables

	(1)	(2)	(3)	(4)
Horizontal	1.002636	1.004594	3.369549	3.980158
Industry concentration			2.001322	2.009188
Horizontal*industry concentration			4.838380	4.849843
Relative deal size	1.017128	1.030486	1.089948	1.090615
Target abnormal returns	1.019598	1.028406	1.034934	1.036358
Initial industry target		1.021800	1.074698	1.078311
Foreign acquirer			1.049137	1.560732
Horisontal*foreign acquirer				2.419327

Table A3.6 Variance Inflation Factors for Regression Models - Firm-Specific Variables

Ramsey RESET Test p-values							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Horizontal	1.451166	1.459480	9.344136	4.874740	1.464992	7.094513	2.068374
EBITDA Margin	1.634132	1.639035	1.646722	1.645761	1.635969	1.639010	1.641317
EBITDA Margin*Horizontal	1.529630	1.531152	1.536811	1.538147	1.536841	1.537414	1.535410
Market share	1.840219	1.840221	1.841494	1.842044	1.842172	1.848257	1.850739
Market share*Horizontal	1.860011	1.860125	1.860873	1.866629	1.862033	1.862265	1.864608
SQRT(% of shares held by largest shareholder)		1.030112	1.605417				
SQRT(% of shares held by largest shareholder)*Horizontal			8.873800				
SQRT(HHI ownership)				1.586530			
SQRT(HHI ownership)*Horizontal				4.560905			
Blockholder (10%)					1.030249	1.843281	
Blockholder (10%)*Horizontal						6.890754	
Negative control							1.541679
Negative control*Horizontal							2.074425

Table A3.7 Ramsey RESET Test P-values of Regression Models With Deal-Specific Variables

	Ramsey RESET Test p-values			
Model	(1)	(2)	(3)	(4)
P-value	0.2405	0.186	0.2436	0.2544

Table A3.8 Ramsey RESET Test P-values of Regression Models With Firm-Specific Variables

	Ramsey RESET Test p-values						
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
P-value	0.5533	0.5798	0.5546	0.5240	0.9461	0.2787	0.7955

Bibliography

Aabø-Evensen, O. K., Hopkins, S., & Corte, L. (2022). Mergers & Acquisitions 2022. *International Comparative Legal Guides*, 19.

Akhavein, J., Berger, A., & Humphrey, D. (1997). The effects of megamergers on efficiency and prices: evidence from a bank profit function. *Review of industrial organization*, 95-139.

Akhigbe, A., Borde, S., & Whyte, A. (2000). The Source of Gains to Targets and Their Industry Rivals: Evidence Based on Terminated Merger Proposals. *Financial Management, 29*, 101-118.

Ambrose, B., & Megginson , W. (1992). The Role of Asset Structure, Ownership Structure, and Takeover Defenses in Determining Acquisition Likelihood. *The Journal of Financial and Quantitative Analysis*, 14.

Astrup Borch, F. (2023). *Langseth Advokatfirma DA*. Récupéré sur Tvangsinnløsning av minioritetsaksjonærer: https://www.google.com/search?q=borch+tvangsinnl%C3%B8sning&rlz=1C1CHBF_enNO1023NO1023&oq=borch+tv&gs_lcrp=EgZjaHJvbWUqBggBECMYJzIGCAAQRRg5MgYIARAjGCcyCwgCEC4YChgTGIAEMg0IAxAAGBMYFhgeGPEE0gEIOTc2OGowajSoAgCwAgA&sourceid=chrome&ie=UTF-8&bshm=bshwcqp/1

Banerjee , A., & Eckard , W. (1998). Is Mega-Mergers Anticompetitive? *The Rand Journal of Economics, 29*, 803-827.

Bauguess, S., Moeller, S., & Schlingemann, F. (2009). Ownership structure and target returns. *Journal of Corporate Finance*, 17.

Baum , J. A., & Shipilov, V. A. (2007). Ecological Approaches to Organizations. *Sage Handbook for Organization Studies*, 55-110.

Bayes Business School & Intralinks. (2016). *Attractive M&A Targets: Part 1 - What do buyers look for?* London: Bayes Business School.

Betton, S., Eckbo, E., & Thorburn, K. (2008). Corporate Takeovers. *Handbook of Corporate Finance: Empirical Corporate Finance*, 39.

Betton, S., Eckbo, B. E., & Thorburn, K. S. (2008). Corporate Takeovers. *Handbook of Empirical Corporate Finance, 91*(2), 158-178.

Bradley, M., Desai, A., & Kim, H. E. (1983). The rationale behind interfirm tender offers. *Journal of Financial Economics 11, 11*, 183-206.

Brar, G., Daniel , G., & Liodakis, M. (2009). Predicting European Takeover Targets. *European Financial Management, 15*, 430-450.

Bru Lien, J., & Vugdalic, S. (2017). The Effect of Ownership Concentration on Deal Probability in Corporate Takeovers. *An empirical study of ownership concentration, with new evidence consistent with the Free-Rider Proposition*, p. 71.

Centre for Applied Research at NHH. (2022). *SNF Report 04/22*. Norwegian School of Economics (NHH), Centre for Applied Research. NHH.

Chatterjee, S. (1986). Types of Synergy and Economic Value. *Strategic Management Journal, 7*, 119-139.

Clougherty, J. A., & Duso, T. (2009). The Impact of Horizontal Mergers on Rivals Gains to Being Left Outside a Merger. *Journal of management studies*, 31.

Davis, F., Davis, S., Sha, X., & Walker, T. (2021). The impact of takeover anticipation on rival firms. *Journal of Business Finance & Accounting*, 25.

Dimopoulos, T., & Sacchetto, S. (2016). Merger Activity in Industry Equilibrium. *Journal of Financial Economics*, 66.

Døskeland, T., & Mjøs, A. (2008). *Utvikling av eierstrukturen på Oslo Børs*. Bergen: Norges Handelshøyskole .

Eckbo, E. B. (1985). Mergers and the Market Concentration Doctrine: Evidence From the Capital Market. *The Journal of Business, 58*, 325-349.

Eckbo, E. (2009). Corporate Takeovers and Economic Efficiency. *The Annual Review of Financial Economics*, 23.

Eckbo, E. B. (1983). Horizontal mergers, collusion and stockholder wealth. *Journal of Financial Economics, 11*, 241-273.

Edmans, A., & Holderness, C. (2017). Blockholders: A Survey of theory and evidence. *The Handbook of the Economics of Corporate Governance, 1*, 541-635.

Erel, I., Liao, R. C., & Michael, S. W. (2023). Determinants of Cross-Border Mergers and Acquisitions. *The Journal of Finance*, 1045-1082.

European Commission and Eurostat. (2017). *NACE Rev. 2: statistical classification of economic activities in the European Community*. Publications Office.

Fridolfsson, S.-O., & Stennek, J. (2005). Hold-up of anti-competitive mergers. *International Journal of Industrial Organization*, 753-775.

Gaughan, P. (2015). *Mergers, Acquisitions, & Corporate Restructurings*. New Jersey: John Wiley & Sons, Inc.

Gaur, A. S., Malhotra, S., & Zhu, P. (2009). Acquisition announcements and stock market valuations of acquiring firms' rivals: A test of the growth probability hypothesis in China. *Strategic Management Journal*, 38.

Grossman, S., & Hart, O. (1980). Takeover Bids, The Free-Rider Problem, and the Theory of the Corporation. *The Bell Journal of Economics*, 22.

Gurvinder , B., Giamouridis , D., & Liodakis, M. (2009). Predicting European Takeover Targets. *European Financial Management*, 20.

Haleblian, J., Mcnamara, G., Kolev, K., & Dykes, B. J. (2012). Exploring Firm Characteristics that Differentiate Leaders from Followers in Industry Merger Waves: A Competitive Dynamics Perspective. *Strategic Management Journal*, 15.

Harvard Business School. (2022). *Compustat*. Récupéré sur Library HBS: https://www.library.hbs.edu/find/databases/compustat

Himmelberg, C., Hubbard, G., & Palia, D. (1999). Understanding the Determinants of Managerial Ownership and Link Between Ownership and Performance. *Journal of Financial Economics*, 353-384.

Himmelberg, C., Hubbard, G., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics*, 31.

Holderness, C., & Sheenan, D. (1988). The role of majority shareholders in publicly held corporations. *Journal of Financial Economics*, 29.

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). *An Introduction to Statistical Learning with Applications in R*. Springer.

Jiang , W., Li , T., & Mei , D. (2015). Influencing Control: Jaqboning in Risk Arbitrage. *Journal of Finance, Forthcoming*, 2635-2675.

Khan, M., Serafeim, G., & Yoon, A. (2017). Corporate Sustainability: First Evidence on Materiality. *The Accounting Review*, 55|.

Khan, N., & Myrholt , T. (2018). *Predicting Norwegian Takeover Targets*. Bergen: Norwegian School of Economics.

King, D., Dalton, D., & Covin, J. G. (2004). Meta-analyses of post-acquisition performance: Indications of unidentified moderators. *Strategic Management Journal, 25*, 187-200.

MacKinlay, C. (1997). Event Studies in Economics and Finance. *Journal of Economic Literature*, 26.

McWilliams, A., & Siegel, D. (1997). Event Studies: Assumptions and Research Design Issues. *Academy of Management Journal*, 32.

Mjøs, A., & Flatebø Selle, S. (2022). *Regnskapsdatabasen - Norwegian Corporate Accounts*. Centre for Applied Research at NHH.

Palepu, K. G. (1986). Predicting Takeover Targets - A Methodological and Empirical Analysis. *Journal of Accounting and Economics*, 32.

Parkash , M., Fu, L., & Singhal, R. (2016). Tobin's q ratio and firm performance. *International research journal of applied finance*.

Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (2002). Corporate Ownership Around the World. *The Journal of Finance, 54*, 471-517.

Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least-Squares Regression Analysis. *Journal of the Royal Statistical Society., 31*(2), 350–371.

Refinitiv. (2022). *The Refinitiv Business Classification - Methodology*.

Roll, R. (1986). The Hubris Hypothesis of Corporate Takeovers*. *The Journal of Business, 59*, 197-216.

Shleifer, A., & Vishny, R. (1986). Large Shareholders and Corporate Control. *Journal of Political Economy*, 461-488.

Statistisk sentralbyrå. (2008). *Standard Industrial Classification*. Statistisk sentralbyrå.

Stillman, R. (1983). Examining Antitrust Policy Towards Horizontal Mergers. *Journal of Financial Economics, 11*, 225-240.

Stock, J. H., & Watson, M. W. (2020). *Introduction to Econometrics* (Vol. 4). Pearson Education.

Tang, Z., & Xu, X. (2016). What Causes the Target Stock Price Run-Up Prior to M&A Announcements. *Journal Of Accounting and Finance*, 15.

Viera Nogueria , N., & Kabbach de Castro, L. (2020). Effects of ownership structure on the Mergers and acquisitions decisions in Brazilian Firms. *RAUSP Management Journal*, 227-245.

Walkling, R. A., & Song, M. H. (2000). Abnormal returns to rivals of acquisition targets: A test of the "acquisition probability hypothesis". *Journal of Financial Economics*, 28.

Yen, G., & Lee, C.-F. (2008). Efficient Market Hypothesis (EMH): Past, Present and Future. *Review of Pacific Basin Financial Markets and Policies*, 24.