Norwegian School of Economics
Bergen, Spring 2022

The Effect of Earnings Growth on Acquirer Returns: Evidence from the Norwegian Stock Market

A Study of the Relationship Between Acquirers' Earnings Growth and Market Reactions to M&A Announcements with Empirical Evidence from the Oslo Stock Exchange in the Period 1997 - 2019

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Master thesis, MSc in Economics and Business Administration, Major in Financial Economics

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Abstract

Earnings numbers are one of the single most important measures of firm performance and is positively associated with stock returns. While M&A announcements have mixed short-term impact on acquirer stock returns, Liu and Tu (2021) find a U-shaped pattern between US acquirers' earnings growth and announcement returns, with a subsequent return reversal for acquirers with recent earnings declines. They argue this return pattern is driven by a tendency for investors to gamble on M&A deals initiated by poorly performing acquirers to generate high synergies.

Based on a sample of 126 Norwegian public acquirers listed on the Oslo Stock Exchange between 1997 and 2019, we perform a replicating study of *Earnings growth and acquisition returns: Do investors gamble in the takeover market?*, by Liu and Tu (2021). We assess the notion that investor overreactions, through disproportionately reacting to acquirers with earnings declines, can explain abnormal returns related to M&A announcements for a sample of 499 deals. We find that M&A announcements lead to small but positive short-term abnormal returns. These short-term positive returns do not persist, as we observe a clear return reversal pattern for acquirers with low and moderate growth. We are not able to attribute this return reversal to poor earnings performance, and we find no evidence of a meaningful relationship between earnings growth and abnormal returns. Moreover, our results are inconclusive when it comes to assessing markets overreaction to deals made by acquirers with significant earnings declines at announcement. We do, however, find evidence of several empirically established effects including a size effect, valuation effects and an effect stemming from method of payment.

Preface

This master thesis was written as the last part of our Master of Science in Economics and Business Administration at the Norwegian School of Economics (NHH) and marks our end at NHH. The process of writing an empirical thesis has been challenging, demanding, and given us great insight into the obstacles that comes with empirical research and analysis.

We would like to extend our sincere gratitude to our supervisor, Tore Leite, for his substantial feedback, great empirical insights, and guidance throughout the master thesis work. Furthermore, we would like to thank SNF research and Børsprosjektet for their invaluable work with Norwegian databases and allowing us access to Norwegian accounting and stock data. Without their work, our study of the Norwegian M&A market would not be feasible.

Bergen, May 2022

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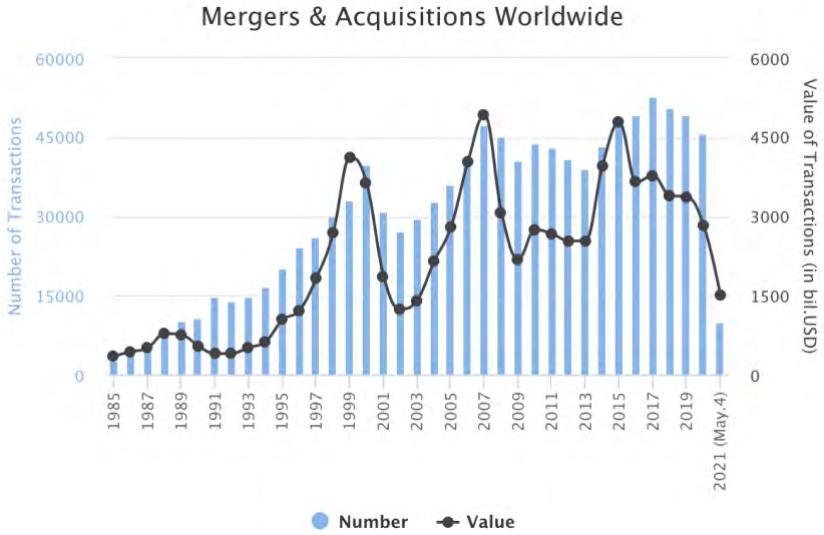
1. Introduction

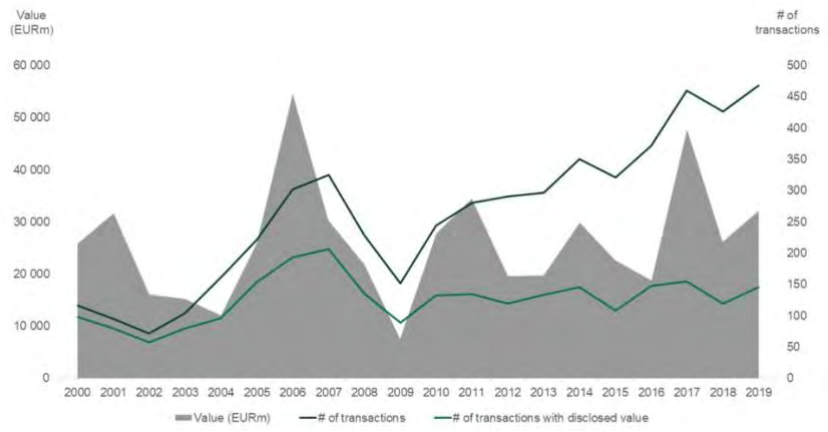
In traditional finance, a primary goal of the corporation is to maximise its financial value for its owners. Corporates therefore often seek to implement strategies that, in broad terms, can be seen as scaling the corporation up or down. This is to best position the corporation for financial value-creation. Since the first wave of mergers and acquisitions (M&A) in the early 1900s, M&As have been a common method of scaling (Martynova & Renneboog, 2008). Figure 1 below illustrates the popularity of M&As with about 800k announced deals globally since the year 2000:

Figure 1: Global M&A deal volume and value since 1985 in $ billion (Imma, 2022)



Although the concentration of M&A activity historically has been in the US and UK capital markets, other markets have also exhibited strong growth in deal volume during the past decades (Martynova & Renneboog, 2008). As shown in figure 2 below, Norwegian M&A activity tripled between 2000 and 2019 in terms of deal volume. M&A deal volume in 2020 with Norwegian targets was 316, with deal values totalling up to about 250 billion NOK (BAHR, 2021).

Figure 2: M&A activity from 2000 - 2019 for deal with Norwegian acquirers and/or targets (Wiersholm, 2020)



The prevalence and growth of M&A transactions have generated a vast amount of research on the performance of M&As, mostly restricted to the US and UK markets (Martynova & Renneboog, 2011). Perhaps the most puzzling phenomenon that frequently appears in this line of research, is the underperformance of acquirers relative to targets both at and after the deal announcement. Whereas target returns are generally found to be large and significantly positive, returns to acquiring firms tend to be close to zero (Cartwright & Schoenberg, 2006; Petmezas, 2009). On top of that, the poor performance of acquirers appears to persist in the years after the announcement, even if the initial market reactions are positive. These findings indicate systematic underperformance for the acquiring part in M&As. Additionally, the observed return reversals imply that there is an initial market overreaction, indicative of irrational investor behaviour (Rosen, 2006). Several attempts have been made to theorise and explain returns to acquiring firms upon and after announcement. Despite this, there is little consensus on the causes of poor acquirer performance, highlighted by the many proposed hypotheses and conflicting evidence on the matter (Eckbo, 2009). An important issue that contributes to this divergence in evidence is that deal announcements can reveal information about both acquirers and targets that is not directly related to deal value (Hietala et al., 2002). Therefore, acquirer returns potentially reflect the market's assessment of acquirer-specific characteristics in addition to deal-specific ones. Such characteristics should thus be included to fully understand the market's reaction and ensuing acquirer returns.

Against this background, this thesis attempts to further elaborate on returns to acquiring firms surrounding a deal announcement. Our starting point is a recent paper by Liu and Tu (2021) - *Earnings growth and acquisition returns: Do investors gamble in the takeover*

market? – which investigates the relationship between abnormal M&A announcement returns and past firm performance in the US market. Their premise is that markets react irrationally to deal announcements based on a propensity to gamble on a turnaround in performance for poorly performing acquirers. Earnings and earnings growth estimates are important predictors of stock returns, and investors might be tempted to gamble that low-growth acquirers will perform better because of the deal. As a result of the market overreaction, a U-shaped relationship between earnings growth and acquirer announcement returns occurs (Liu & Tu, 2021). These findings deserve further attention, as they contradict theories of efficient markets, and several other theoretical predictions of acquirer returns upon announcement. In less liquid and concentrated markets such as the Norwegian one, we furthermore expect even stronger short-term deviations from efficiency. This is especially because liquidity is thought to positively correlate with market efficiency (Chung & Hrazdil, 2010).

We thus empirically explore announcement returns to Norwegian public acquirers by conducting a replicating study of Liu and Tu's (2021) study. The research question of our thesis follows naturally:

> ***Is there evidence of market overreaction to M&A announcements from listed Norwegian acquirers with low earnings growth?***

However, we do not assume the "gambling hypothesis" to explain the overreaction phenomenon. A well-known issue within M&A research is the focus on creating new models and finding new explanations rather than building on existing ones (King et al., 2004). Hence, we find it more appropriate to interpret our results in the view of more established theoretical predictions, while remaining true to Liu and Tu's (2021) empirical approach. Specifically, we base our main hypotheses on the theoretical prediction that investors only gradually manage to fully assess a deal due to extrapolation or over-optimism regarding past firm performance (Rau & Vermaelen, 1998; Rosen, 2006). This predicts that acquirers whose past performance is good will exhibit higher returns around announcement than worse performing acquirers. Earnings growth here serves as a proxy for firm performance.

To examine the announcement returns to Norwegian acquiring firms, we retrieve a sample of deals announced by Norwegian public acquirers from the Securities Data Company (SDC) Platinum financial database by Refinitiv. We end up with a sample of 499 deals after limiting the sample period to 1997-2019. We then capture the market reaction to the deal

announcements by estimating abnormal stock returns to acquirers using different event windows. The returns are regressed against earnings growth as the main predictor, after controlling for relevant firm-specific and deal-specific variables. In line with previous findings, we find small but positive returns in the days surrounding announcement. The average cumulative abnormal return (CAR) in a five-day window surrounding an announcement is 1.74%, which turns negative when expanding the event windows. We also observe a trend that the highest-growth acquirer stocks exhibit significantly higher returns than lowest-growth acquirers. However, this trend is not uniform across all earnings deciles, and we are not able to establish any significant statistical relationship between earnings growth extremes and announcement CARs. We attribute some of this to issues related to having a small sample size with a large variation in returns. Payment method, deal size, and acquirer size are further shown to significantly correlate with short-term CARs. We follow up on these latter findings and argue that they mostly agree with previous literature. Our overall evidence supports our main hypotheses to some degree, but not on a level where we can reject alternative explanations like that of Liu and Tu (2021) with much certainty.

Our thesis contributes to the existing literature on acquirers' announcement returns on numerous matters. First, we expand Liu and Tu's (2021) findings by further examining earnings growth's role in explaining acquirer returns. Second, our thesis significantly extends the literature on Norwegian M&As and acquirer returns. Mainly, we document positive short-term announcement returns preceding negative return reversal in the long-term, indicative of initial overreaction to deal announcements on Oslo Stock Exchange. Finally, our findings comply with several already established effects on acquirer returns, further validating those effects as determinants of acquisition returns. Inter alia, we find positive effects of stock payments for private targets and a negative relationship between acquirer size and returns, consistent with previous research.

The rest of this thesis is structured as follows. Section 2 considers relevant theory on M&As and corresponding market reactions, as well as empirical findings regarding acquirer returns from M&A announcements. Section 3 explicitly sets out our hypotheses. Section 4 recounts the process of collecting data and sampling. In section 5 we explain the methodology used as a basis for our analysis. Section 6 provides our main results, including tests of robustness. We finally conclude in section 7 by summarizing our findings, discussing limitations, and highlighting implications of our thesis.

2. Literature Review

With the intention of giving readers a solid base for understanding our ensuing analyses, section 2 presents relevant theoretical and empirical literature on the M&A performance topic. The ability of acquiring firms' shares to exhibit abnormal returns from corporate events is the central premise of our thesis. Hence, we first introduce the literature which support such a premise. Throughout the review, we look at suggested explanations for market reactions to M&A announcements that deviate from traditional financial theory. Next, we outline some of the main empirical findings on returns to acquirers surrounding announcement. Finally, we logically establish links between market reactions to M&A announcements and an acquirer's earnings.

2.1 Overview of M&A Performance and Acquirer Returns

M&A performance is a broad term whose substance can be interpreted equivalently as broad. The issue can perhaps be traced back to the definition of *firm performance* itself, which has come to grow much more complex than the shareholder value doctrine proposed by Friedman in the 1970s (Friedman, 2007). Firm performance is not necessarily limited to the financial, share price-based dimension. Instead, it can be seen as a multidimensional concept that, along with financials, comprises dimensions such as the social and environmental ones (Richard et al., 2009). As a result, looking at overall welfare generated to stakeholders becomes just as valid as looking at shareholder value. Relating M&A to firm performance thus becomes an exercise yielding great divergence in the literature which attempts to explain M&A performance (Bauer & Matzler, 2014; Larsson & Finkelstein, 1999). This divergence consists of both measurement method and result divergence following the many possible approaches to the research.

Zollo and Meier (2008) find that most research on M&A performance and success has been conducted based on short-term event studies or long-term accounting measures. As they point out, these are objective, quantitative approaches that relate M&A performance to firm performance using stock prices and accounting measures such as return on invested capital. Share prices, as well as accounting measures through their assumed effect on share prices, do indeed make up the standard measures of firm performance in financial economics research (Bhagat & Bolton, 2008; Deschow, 1994). However, Zollo and Meier show that short-term

movements in share prices are not actually measuring M&A performance per se, but rather reflect the market's expectations for a specific M&A transaction. Their view is in line with that of King et al (2004) who point out that researchers miss out on effects of M&As on other performance dimensions, particularly nonfinancial ones. One potential implication of these views is that shareholder returns closely surrounding an M&A announcement can be understood in light of short-term stock market expectations. A natural starting point for such an understanding is exploring the hypothesis of efficient markets.

2.1.1 Market Efficiency and Implications on Returns

In simple terms, the efficient market hypothesis (EMH) of Fama (1970) states that asset prices reflect all relevant information. Prices will accordingly adjust to a corporate event, ceteris paribus, by the change in firm value the corporate event produces. For an acquirer, this means an M&A announcement should lead to a share price change by the expected transaction value/synergy. Perhaps more importantly, EMH implies that the ex-post share price will not drift upward or downward, ceteris paribus (Das & Kapil, 2012; Laabs & Schiereck, 2008). Generating persistent abnormal returns is consequently not feasible if the EMH holds for the acquirer's stock. Malkiel (2003) argues in favour of the EMH by dissecting prior research that suggests longer-term market inefficiencies are possible. While admitting some deviation from efficiency is possible, both Malkiel (2003) and Fama (1998) contend that these deviations only exist within certain models and that share price predictability does not persist. Malkiel (2003) specifically reasons that any form of inefficiency or market anomaly will be exploited by the market to the extent that the inefficiency ceases to exist. Building on this reasoning, an overreaction tendency in share prices around merger announcements cannot persist; investors start exploiting the inefficiency through earlier and earlier profit-taking, soon eliminating the overreaction-effect altogether.

Grossman and Stiglitz (1980) point out a potential EMH fallacy based on information costliness. Since information is costly to obtain, asset managers and investors with financial interests require compensation in the form of returns. If the EMH holds, any information obtained is already reflected in the prices and excess returns cannot be achieved. Investors will therefore not be incentivised to buy shares, leading to markets drying out. There has also been done much research, especially within the behavioural finance area, suggesting that

inefficiency is the norm rather than the exception (Lim & Brooks, 2011). Circling back to the findings of Zollo and Meier (2008), the short-term movements in acquirer share prices around announcement possibly reflect the markets' collective bet on the acquisition outcome rather than efficient incorporation of relevant information. The bet need not even be considerate about the deal's value creation; it can just as well be driven by investors' attraction to lottery-like stocks and gambling on low-probability outcomes (Bali et al., 2011). Hence, it is plausible that acquirers' shares can exhibit persistent abnormal announcement returns.

The Grossman-Stiglitz paradox is not necessarily attributable to the M&A setting though. If EMH holds in its semi-strong form, meaning markets reflect all publicly available information, shareholders of acquiring firms will only earn at maximum "normal" returns (Barney, 1988). From a shareholder value point-of-view then, this implies one could leave shareholders better off by not doing such a transaction at all, depending on its costliness. However, we have previously seen that it is naïve to only view M&A performance in terms of share performance. It follows that M&A activity could be driven by factors not related to share prices.

2.2 Acquirer Returns – Empirical Evidence

2.2.1 Briefly on Theories of Acquirer Returns

What should we expect to find when looking at empirical research on acquirer returns? The general view in existing literature is that acquiring firms' shareholders earn either zero or small negative abnormal returns around deal announcement (Eckbo, 2009). Theories of acquirer returns are as a result often centred on this premise. At the same time, theoretical explanations differ in what assumptions are made on market efficiency. The "Hubris Hypothesis" put forward by Roll (1986) for instance, is a proposed hypothesis on takeover returns stating that poor acquirer performance stems from overconfidence resulting in overpayment. This hypothesis is consistent with market efficiency and rather "places the blame" on irrational managers of acquiring firms. Several other theoretical propositions build on a premise where managers act irrationally or in their self-interests at the expense of shareholders (Burkart & Panunzi, 2006).

On the opposite end, Shleifer and Vishny (2003) propose a model where markets are inefficient while managers act rationally with regards to mispricing. This setting allows for market-timing by financing acquisitions with stocks when stocks are overvalued. It also implies that acquisitions are beneficial to shareholders of the acquiring firm even if no synergies are demonstrated, because of advantageous mispricing (Savor & Lu, 2009). Acquirers' shares can correspondingly exhibit positive returns near announcement, only to revert in the longer-term when fundamental features play a more important role for valuation (Rhodes-Kropf & Viswanathan, 2004; Rosen, 2006).

2.2.2 Main Empirical Findings on Acquirer Returns

Empirical research on acquirer returns, although somewhat divergent, tends to indicate that acquiring shareholders lose or at a maximum earn very small abnormal returns from acquisitions. In their review of research on the market for corporate control, Jensen and Ruback (1983) find evidence that support such a notion. They infer that small but statistically significant positive returns are mainly observed in tender offers that succeed. Mergers at the other hand are mostly found to yield zero return to acquiring shareholders. Perhaps more importantly, some acquirers' stocks were found to exhibit persistent negative abnormal returns ex post which is inconsistent with the EMH and the Hubris Hypothesis (Louis, 2004). Agrawal and Jaffe (2000) address this post-performance anomaly in a similar review of the empirical research on takeover returns. Generally, they find that the underlying research evidence supports the view that acquirers perform poorly after mergers. The examined research provide evidence more in line with the misvaluation theories, like that of Shleifer and Vishny (2003).

Fama (1998, p.304) similarly examines research on long-run acquirer performance. Unlike the above findings, he argues that deviations from the EMH through overreactions and underreactions to news, occur with roughly the same frequency. Therefore, the anomalies reflect chance rather than systematic errors. A more recent review of empirical findings regarding acquirer returns is conducted by Eckbo (2009). The research reviewed consists of large-sample studies estimating short-term CARs around announcement for US acquirers. It should first be mentioned that researchers typically try to explain variations in abnormal returns through two main groups of characteristics:

- *Acquirer/target characteristics*:
- *Deal characteristics*

Acquirer/target characteristics include firm-specific attributes like size, capital structure and public status, whereas *deal characteristics* include attributes like payment method, transaction value and hostility (Moeller et al., 2004). Consistent with the previous empirical reviews mentioned above, Eckbo (2009) shows that the overall tendency in the findings is zero or small negative returns from mergers, and small positive returns from tender offers. One central finding is that "… there are nearly as many mixed cash-stock offers as all-stock offers, even in the recent period of high market valuations…" (Eckbo, 2009, p. 173). The market-timing theory predicts that high valuations increase the frequency of all-stock offers, since acquirers seek to exploit mispricing of their shares. Without any systematic pattern in all-stock vs mixed stock-cash offers, a market-timing explanation for long-term declining acquirer returns seems less plausible. Dong et al. (2006) on the other hand, find support for this misvaluation hypothesis. Their results indicate that all-stock offers are associated with higher acquirer valuations, and that abnormal returns on announcement are about 1.5% lower for high price-to-book (P/B) acquirers than low P/B acquirers. It is important to note that this effect is applicable to public targets, but not necessarily private targets due to monitoring and information effects (Chang, 1998). Specifically, Chang (1998) finds support for a monitoring hypothesis where the monitoring of an acquirer becomes more effective as external block holders (from the target) are created from the acquisition. Moreover, he finds some support for an information hypothesis where the private target shareholders' willingness to accept the offer is a positive signal about an acquirer. Several studies support Chang's (1998) findings that all-stock offers are associated with positive returns following announcements with private targets (Fuller et al., 2002; Moeller et al., 2004). Note that these results only involve returns on the actual announcement date.

The disagreement on misvaluation hypotheses is illustrative of the state of empirical research on acquirer abnormal returns following M&As. Despite disagreement regarding theoretical explanations, there are still clear indications that acquirer abnormal returns *on average* are small or indistinguishable from zero. Interestingly, this return patterns seems transferable to markets outside the US market, upon which most of the research is conducted. Martynova and Renneboog (2011) looked at 2,419 takeovers from 28 European countries, concluding that acquirer announcement-date abnormal returns were significant at only 0.53%. Furthermore, these abnormal returns turned significantly negative, although still small at

-2.83%, when increasing the event window to [-60, +60]. Moreover, they found support for several of the typical findings in empirical research on the US market, including negative market reactions to all-stock offers. Goergen and Renneboog (2004) likewise find small, positive, and significant announcement-date abnormal returns to acquirers of 0.7% in a sample consisting of 228 all-European deals described as *large* (>$100m). Just as for Martynova and Renneboog (2011), increasing the event window to [-60, +60] makes the abnormal returns turn negative, although statistically insignificant in this case.

Altogether, there is compelling empirical evidence from both US and European markets that short-term abnormal returns to acquiring firms in M&As are close to zero, and that the sign (+/-) of the returns depend upon both acquirer-target and deal characteristics.

2.3 Earnings Growth and Market Reactions to M&As

We will briefly examine literature on earnings growth and market reactions to M&A announcements. This is to establish the potential significance of earnings growth in relation to acquirer returns, as well as to elaborate further on explanations for market reactions observed around announcements.

2.3.1 Earnings Growth and Acquirer Returns

As Liu and Tu (2021, p.7) point out, "there are no clear theoretical predictions about the relation between earnings growth and bidder returns". Nevertheless, earnings are undoubtedly a frequently used predictor of stock prices, perhaps best reflected in the widespread use of price-earnings ratios (P/E). P/E ratios, sometimes referred to as the E/P, have been found to explain significant amounts of variation in stock returns (Campbell & Shiller, 1988). Earnings growth enter the P/E equation through the basic dividend discount model, as shown in the following equations for current earnings per share: (Damodaran, n.d., p.16):

$$P_0 = \frac{Dividend\ per\ share_1}{r - g_n}$$

$$\frac{P_0}{EPS_0} = \frac{Payout\ ratio * (1 + g_n)}{r - g_n}$$

What this suggests is that ceteris paribus, high (low) growth firms have high (low) P/E ratios. Also, note that the pricing model implies that large current earnings is not the main driver for increased stock prices. It is rather the expected future change (growth) in these earnings that matter. Still, past earnings changes can matter for future stock prices and returns. Markets typically believe that past earnings changes persist in future periods, justifying an ex-ante high valuation in P/E terms. However, research on earnings growth persistence find little evidence of systematically persistent future growth, especially among firms with volatile earnings (Chan et al., 2003; Dichev & Tang, 2009).

The latter insight provides an interesting link between earnings growth and M&A returns through the extrapolation hypothesis proposed by Rau and Vermaelen (1998). In simple terms, the hypothesis states that market participants use past financial performance of acquirers as a starting point for assessing an announced deal. Markets will as a result extrapolate past performance into the announcement period and "only gradually reassesses the quality of the bidder…" after announcement (Rau & Vermaelen, 1998, p.226). It implicitly follows that those deals announced by acquirers with good past performance (glamour acquirers) are overestimated while poor performers (value acquirers) are underestimated in their ability to create value. Performance is proxied by book-to market value of equity, where glamour acquirers have low book-to-market (B/M) values and vice versa. Sudarsanam and Mahate (2003) argue that the P/E ratio is a better proxy to distinguish glamour and value acquirers as it is more widespread in valuing stocks. Nevertheless, both papers find relatively similar results which is also consistent with the overall findings cited in section 2.2. Specifically, both provide evidence that glamour acquirers underperform value acquirers in the long-term, while also finding support for the suggestion that markets gradually reassess deals after the announcement-date.

2.3.2 Anomalous Market Reactions to M&As

Dutta and Jog (2009) study 1300 Canadian M&As between 1993-2002, and similarly to prior research find that the market seemingly reassesses deals gradually after announcement. Notably, abnormal returns in event windows up to two days post announcement are found to be significantly positive before turning insignificant when the event window increases to +15 days. Overall, these findings are interesting from a behavioural standpoint as they might be indicative of irrational price movements surrounding M&A announcements, particularly in certain subsamples. In the asset pricing literature for instance, there is some evidence for the presence of overoptimism regarding earnings growth forecasts for glamour stocks with high P/E ratios (Skinner & Sloan, 2002). Overoptimism hypotheses, presumably related to market sentiment and momentum, are also tested in the M&A literature. Rosen (2006) studies 6,259 M&As from public acquirers in the period 1982-2001. His findings are consistent with an overoptimism hypothesis, where market reactions to deal announcements stems from momentum rather than specific factors related to a deal's value creation. In periods where momentum in merger markets is strong, proxied by high abnormal market returns over the last year, Rosen finds an effect that by now should be familiar: initial positive abnormal returns near announcement-date reverse in the long run. Similarly, Antoniou et al. (2007) find that frequent UK acquirers announcing deals in the period 1987-2004 endure negative abnormal returns in the long run, suggestive of initial market overreaction. All these return-reversion findings are opposed to Hirshleifer's (2001) statement that ex post returns from corporate events exhibit the same sign (+/-) as the event-date reaction.

Giving an elaborate review on all possible explanations for the systematic and unsystematic patterns that have been discovered here is beyond the scope of this thesis. This literature review nonetheless comprises a solid foundation for understanding both theoretical predictions and empirical findings on returns to acquiring firms.

3. Hypotheses

Whilst we are looking to expand on Liu and Tu's (2021) findings, our theoretical and empirical foundation differ to the extent that we choose to perform both revisions and additions to their hypothesis base. These changes are necessary if we are to achieve our thesis' goals as defined earlier: replication and expansion on previous findings. Additionally, the presented findings in M&A literature suggest that the pattern in acquirer returns following announcement are relatively similar across US and European markets. Therefore, it seems valid to assume similar patterns can be found in the Norwegian M&A market, especially since we are also looking at cross-border deals.

3.1 Earnings Growth's Effects

Most pre-existing literature agrees that abnormal returns observed shortly after deal announcement tend to be small and often insignificant for acquirers. Moreover, longer-term abnormal returns are often found to be persisting and significantly negative. We expect the average Norwegian acquirer to exhibit a similar return pattern. Our interest, however, lies mainly in the return patterns of lower and upper bound earnings growers. Within this setting, the cited research suggests that high-growth acquirers perform better around announcement due to extrapolation of past growth or over-optimism regarding future performance. Combined with insights from Liu and Tu (2021), we define our initial hypotheses as follows:

H1a: *Acquirers with high (low) earnings growth demonstrate higher (lower) abnormal returns initially around deal announcements*

The research also suggests that initial market reactions to deal announcements are reverted as the market gradually reassesses the deal and acquirer. This indicates a pattern where high-growth (low-growth) acquirers are overestimated (underestimated) in the short-term, whereas long-term performance is stronger for low-growth acquirers. Yet, the previously presented evidence strongly insinuate that acquirers earn negative abnormal returns in the long run, indicative of initial overreaction. We therefore expect that the stock prices will drift downward, leading to negative abnormal returns when expanding the event windows. The

overreaction is expected to concentrate among high-growth acquirers due to extrapolation or overoptimism based on past good performance:

H1b: *Markets overreact to deals announced by acquirers with high earnings growth, leading to a subsequent downward drift in share price as markets reassess the deal*

Note how these hypotheses can be seen as alternative hypotheses to a null EMH hypothesis, where investors only care about value-creation from the specific deal and act rationally regarding this information.

3.2 Supplemental Hypotheses: Acquirer and Deal Characteristics

The literature also indicates several effects on acquirer returns which should be expanded on. We accordingly propose supplemental hypotheses on acquirer performance relating to earnings and earnings growth. First, we have referred to theories suggesting that overvalued acquirers prefer all-stock offers to profit from mispricing. It has also been established that high P/E firms are typically overvalued due to overly optimistic predictions of future, persistent growth:

H2: *Acquirers with high (low) earnings growth are more (less) likely to pay through all-stock offers, which should negatively affect abnormal returns*

Sudarsanam and Mahate (2003) implicitly present the P/E and M/B ratios as proxies for the same phenomenon, in their extension of Rau and Vermaelen's (1998) extrapolation hypothesis. Given that those ratios proxy for the same thing, we can also define a consistent hypothesis with M/B based on the P/E hypotheses. Specifically, if high P/E implies high B/M (glamour) and vice versa, then we expect:

H3: *Acquirers with low (high) B/M ratios initially exhibit higher (lower) abnormal returns following deal announcement, with subsequent negative returns in the longer term*

4. Data

In this section, we recount the process of collecting relevant data. Also, we describe the formation of the final samples for analysis. Finally, descriptive statistics from the sample is presented to give an overview of relevant sample characteristics.

4.1 Data Sources and Collection

4.1.1 M&A Data

M&A data are obtained from SDC by Refinitiv. SDC contains deal-specific information on around 1.3 million M&As dating back to the 1970s, including deal participants and announcement dates (Refinitiv, 2022). Our M&A data include all deals between January 1st, 1997, and December 31st, 2019, that all fulfil a certain set of constraints. In addition to announcement dates and acquiring companies, we also get relevant measures such as acquirer industry, payment methods, deal values and percent of shares held before the announcement. Restricting the analysis to only Norwegian acquirers, we initially get a sample of 8197 deals. After applying the following constraints, we end up with a final sample of 499 M&A deals:

- The deal must be announced between January 1st, 1997, and December 31st, 2019
- The acquirer primary nation is *Norway* (NO)
- The acquirer must be defined as *Public* (P) have been listed on the *Oslo Stock Exchange* (OS) or *Oslo Axess* (O3) at least one year prior to the M&A announcement
- The deal must be defined as a *Merger* (M), an *Acquisitions of Assets* (AA) or *Acquisition of Majority Interest* (AM)
- The target companies are both *US-targets* and *non-US targets*
- Deal value accumulates to at least $1 million
- The acquirer's ownership pre-acquisition is below 50%
- The acquirer's ownership post-acquisition is above 50%
- At least two years of accounting data preceding the deal announcement year must be available in the SNF accounting database
- Sufficient stock data from Børsprosjektet must be available for estimation purposes

Although SDC provides data back to 1970, the start date is set to January 1st, 1997. This is mainly to satisfy the need for using market indexes in an investigation period for analyses of abnormal returns. Abnormal return analyses require estimation of "normal returns", where one typically uses a single index model and estimates expected returns based on stock performance relative to a market index. Most Oslo Stock Exchange indexes were introduced on December 29th, 1995, and consequently, the need for consistent index data one year preceding the deal announcement justifies the chosen start date. Secondly, the end date is chosen to be December 31st, 2019, because the NHH accounting database only provides accounting data until fiscal year-end 2018, making more recent analysis unfeasible.

Following Liu and Tu (2021), we set the minimum deal value to $1 million, equating to roughly 9 million NOK. All currency data are converted to NOK using currency data from Norges Bank (2022). Whereas the value is seemingly arbitrary in NOK, the Refinitiv database is listed in USD, and consequently, a USD constraint is the most appropriate. Additionally, we seek larger acquisitions, as they are of greater economic significance and subsequently worth more attention (Gregory, 1997).

4.1.2 Stock Price Data

Historical stock data are mainly retrieved from Børsprosjektet at NHH, via the web-based tool Amadeus 3.0 (Børsprosjektet NHH, 2020). Børsprosjektet contains, inter alia, daily stock price data on all companies listed on the Oslo Stock Exchange and Oslo Axess back to 1980. However, there are shortcomings in the dataset when it comes to recent price data. There is only data preceding November 27th, 2020, coinciding with the migration of Oslo Stock Exchange to Euronext's own trading system (Pareto Securities, 2020). Our long-term analysis requires daily stock prices for the companies whose long-term event period exceeds this system change date. For stocks where the data from Børsprosjektet are insufficient, we retrieve stock price data directly from Euronext's websites (Euronext, 2022).

To obtain daily price observations, we get the variable *Generic* from Børsprosjektet to use as the main stock price variable. *Generic* gives us the last available closing price each day in the defined period, whereas the *Last* price variable only provides closing prices on trading days or days with liquidity in the stock. Also, we get the variable *ReturnAdjGeneric*, which shows the adjusted daily simple returns of a stock. The adjustments are made to eliminate effects on prices of stock dividends and splits (Rojahn & Støle, 2019).

Furthermore, we use the Oslo Børs All-share Index (OSEAX) as a benchmark index to calculate expected market returns. Børsprosjektet provides daily return data on the OSEAX from December 1995 and onwards. Our initial data contain many stocks listed on the Oslo Stock Exchange and Oslo Axess between 1997-2019, and not only those in the main index OSEBX. Consequently, an all-share index is a sensible proxy for the market we are looking at. This is highlighted by the fact that OSEBX's top 10 companies made up around 62% of the index at the end of 2021, making the index biased toward large-capitalization companies (Euronext, 2021).

4.1.3 Accounting Data

Data on acquirers' earnings, equity values and other relevant accounting items are provided by SNF's and NHH's own database (Berner et al., 2017). The database contains individual and consolidated financial statement data for practically all Norwegian companies and groups for the period 1992-2018.

We use *aarsrs* as the earnings measure. *aarsrs* measures net income of a company attributable to shareholders. Moreover, we get the variable *ek* which measures the book value of equity. In combination with data on market capitalizations, this allows us to calculate B/M ratios for every acquiring firm in our sample.

The accounting variables are not normalised, meaning they might contain extraordinary items that do not reflect the core value creation of the business. Adjusting for non-recurring income/costs and other special items for all companies is beyond the scope of this thesis. Also, book value of equity is seldom a precise measure of actual equity value, especially for companies whose balance sheets mainly consist of intangible assets. An important reason for this imprecision is the accounting regulation and frameworks which don't allow fair-value recognition of assets with "uncertain" true values. Possible implications of using non-normalised financial statements are addressed in section 7.2.

4.1.4 **Long-term Subsample**

In the extension of our short-term analysis of acquirer abnormal returns, we also analyse the earnings growth relationship over periods of 1-3 years using both long-term CAR and buy-and-hold abnormal returns (BHAR) techniques. Forming the BHAR sample, we follow Liu and Tu's (2021) approach. Hence, each M&A acquirer is matched against a comparable firm with the closest fiscal year-end B/M ratio preceding the deal year, out of all firms with a market capitalization between 70% and 130% of the specific acquirers' market capitalization. Potential matching firms are chosen out of all available firms on the Oslo Stock Exchange and Oslo Axess in the year preceding the deal year, given the firms have at least three years of stock data after the deal announcement date. Note that Liu and Tu (2021) can retrieve up-to-date B/M and market capitalization data directly from Compustat and use B/M ratios from the most recent month prior to acquisition announcement. Due to the limited access to accounting data, we must use the most recent year-end data for Norwegian firms. Furthermore, a weakness of a small market is the lack of comparable firms. We find that there are several firms in the 95th percentile of market capitalization within the Norwegian stock market which have very few to no potential matches. These firms with no potential matches are consequently omitted from the long-term BHAR sample. Finally, we do not have access to dividend data beyond November 2020, and so deals whose event windows move into this period are omitted. This leaves us with a long-term subsample of 337 observations.

For the long-term CAR analysis, market capitalization poses no problem as all returns are matched to the OSEAX index. As with the BHAR sample, we omit observations without three years of continuous stock data succeeding the deal. This leaves us with 395 observations.

4.2 Selection of Independent Variables

The independent variables used in our analyses are selected based on the approach by Liu and Tu (2021), and literature as discussed in section 2 where we introduce qualitative factors that potentially affect M&A performance.

4.2.1 **Earnings Growth**

Earnings Growth is calculated as the change in fiscal year-end earnings attributable to shareholders after taxes in the two years immediately prior to the deal announcement year. Earnings changes are then deflated by the firm's book value of equity to avoid concerns about market-based deflators or share price deflators (Cheong & Thomas, 2010).

To test the robustness of our findings, we also include alternative performance measures to earnings growth. This includes growth in fiscal year-end earnings deflated by total assets, growth in operating income and using 6-month and 12-month trailing stock returns as a measure of recent firm performance.

4.2.2 **Book-to-Market**

The Book-to-Market ratio is calculated by dividing an acquirer's book value of equity by its market capitalization. The book values of equity are retrieved from the NHH accounting database, variable *ek,* whereas the market capitalization is determined from the combination of fiscal year-end common stock price and number of shares issued as per Børsprosjektet.

As highlighted by Rau and Vermaelen's (1998) extrapolation hypothesis, we expect B/M ratios to be positively associated with post-announcement returns as it proxies for the glamour vs. value categorization. It is reasonable that low B/M acquirers exhibit return reversals as they are, in general, relatively more overvalued compared to high B/M acquirers. Similarly, Dong et al. (2006) show that acquirers with higher valuations, proxied by P/B, display lower announcement returns than acquirers with lower valuations. We thus include B/M to isolate these effects on announcement returns.

4.2.3 **Method of payment**

Previous literature shows that payment method significantly relate to announcement returns. Myers and Majluf (1984) explain that all-stock deals should yield lower returns than cash

payments, as stock payments signal to the market that stock prices may be above their fundamental value. This reasoning is what the previously cited market-timing explanations for declining acquirer returns is built on. We also expect stock payment to affect returns to deals with private targets, as per Chang (1998). Hence, we control for the effect of payment methods by including two separate dummy variables equal to 1 for final considerations offered being *Cash only* or *Stock only.*

4.2.4 **Hostile Takeovers**

Hostile takeovers were initially considered a mechanism both for raising shareholder value and for enhancing the corporate system (Deakin & Slinger, 1997). More recently, hostile takeovers have been associated with redistribution of wealth, which potentially threatens the long-run productivity and competitiveness of the firm (Deakin & Slinger, 1997). Hostile takeovers have thus become increasingly uncommon post year 2000 but is a determinant for success in M&A takeovers, and hence should be included in the analysis. We include a dummy variable equal to 1 if attitude is classified as *Hostile*.

4.2.5 **Relative Size**

The relative size between acquirer and target is often tested as a determinant of M&A success. Previous literature shows that acquirers with larger relative size to targets perform worse post-acquisition than acquirers of smaller firms (Healy et al., 1992; Ramaswamy & Waegelein, 2003). This is because acquirers of large relative deals have more difficulty in incorporating the acquired firm into its operations and hence struggle more with realizing synergies. Relative Size is therefore included as a proxy to control for integration costs and synergy potential in the deal. Acquiring relatively large companies should be related to higher integration costs and high synergy potential, while also requiring higher premiums (Moeller et al., 2004). All this should affect post-announcement abnormal returns. Relative Size is calculated as the transaction value over the acquirer's market capitalization.

4.2.6 **Bidder Size**

Moeller et al. (2004) document that there is a definitive size effect in acquisition returns. The size effect implies that small acquirers create profitable acquisitions, while large acquirers make acquisitions that lead to losses for their shareholders. This is in line with Eckbo's (2009) review where several of the presented findings support that acquirer size, measured

by equity, is negatively related to announcement returns to acquirers. We therefore include bidder size to control for the size of the acquiring firm, and to observe if there are significant differences in abnormal returns among small and large firms. Bidder size is proxied by the total book value of assets, *sumeien*.

4.2.7 **Leverage**

The prior discussions reveal that the size of underlying assets involved in M&A deals may affect returns to shareholders. This also holds true for the relative size of underlying assets. Maloney et al. (1993) show that acquisition performance is positively related to leverage. They find a positive relationship between leveraged acquisitions and the market's assessment of the managerial choice to acquire. This is then attributed to agency costs, in that capital structure adapts to account for these costs. This is not to say leverage is value-creating in itself, but leverage makes managers more accountable and hence increases efficiency in managerial decision making. We therefore include leverage in our analysis to account for agency costs of leverage, which could lead more leveraged firms to better acquisitions, and subsequently higher abnormal returns. Leverage is proxied by the total sum of debt, *gjeld*.

4.2.8 **Private Target**

Acquisition of private firms or subsidiaries is an important part of the takeover market (Fuller et al., 2002). Fuller et al. (2002) find a strong difference in reaction to public vs. private acquisitions. Private acquisitions tend to yield significantly positive returns, while public acquisitions tend to yield significantly negative returns. The difference in market reactions presumably comes from a discrepancy in price, where the acquirer tends to receive better pricing when buying non-public firms. This comes from a liquidity effect, where private firms cannot be sold as easily as publicly traded firms, and therefore this lack of liquidity makes private acquisitions less valuable than more liquid investments (Fuller et al., 2002). We therefore use a dummy variable taking on the value 1 if the target firm in the acquisition is not classified as *Public* according to SDC.

4.2.9 **Toehold**

Many prior studies have shown that obtaining a toehold has a significant effect on M&A performance: obtaining a toehold before a full acquisition offer is profitable for acquirers. By

trading in the stock, before the acquisition becomes public knowledge, a potential acquirer may initiate the acquisition without paying a premium for the shares acquired in the open market (Bris, 2002; Georganas & Nagel, 2011). Toeholds acquired before the acquisition are found to improve detection of potential deal synergies, to discourage competitors from acquiring and to increase the probability of a successful acquisition (Bessler et al., 2015; Povel & Sertsios, 2014). However, Wilmink (2017) shows that toehold bidding tends to yield negative returns. This is because toeholds tend to be associated with an unfriendly approach to the target, leading to negative perceptions by shareholders. Additionally, toehold bidding reduces the probability of including termination fees in the process, which also can be negatively perceived by shareholders (Strickland et al., 2010). We therefore include a dummy variable equal to 1 if *% held prior to transaction* is nonzero and less than 5%.

4.2.10 **Cross-Border**

Whether a deal is cross-border or not is commonly used when trying to explain variations in announcement returns to acquirers (see for example Goergen & Renneboog, 2004). Cross-border deals tend to be more value-creating than domestic acquisitions. This is sometimes attributed to the fact that using M&As as an investment strategy may allow acquirers to expand their current operations while overcoming several entry barriers faced when using other methods of foreign direct investments (Wilmink, 2017). As such, cross-border deals potentially create value through market expansion while limiting risks of barriers to entry destroying value. We therefore include a dummy variable equal to 1 if a deal is flagged as *Yes* by the variable Cross-Border in the SDC database.

4.2.11 **Control variables**

To strengthen the analysis, we also impose several other control variables to control for unexplained variation in the results. Primarily, we seek to impose control over fixed effects within the dataset. Hence, we control for year-specific effects through dummy variables for each year, and control for time-invariant industry-specific effects through dummy variables for each SIC level industry. Lastly, we need to impose control over the interaction between year and industry-level effects for robustness purposes. Accordingly, we include dummy variables for the interaction between industry and year, controlling for the interaction in time-invariant characteristics and year-specific effects.

4.3 Descriptive Statistics

Table 1: Characteristics of bidding firms and M&A deals

This table shows the descriptive statistics for our sample of Norwegian acquiring firms that participated in M&A deals between January 1st, 1997, and December 31st, 2019. This entails 499 deals. The table displays financial and accounting characteristics of acquirers prior to announcement. It also shows several deal-specific characteristics, and the abnormal returns for different event windows. For each variable, we report mean, median, standard deviation, 5th percentile and 95th percentile. For binary variables, "Mean" reflect the total fraction of the sample equal to 1, and consequently is presented in percentages. Median, p5 and p95 is not reported for these variables. Bidder size is measured in million NOK. All independent variables are defined in section 4.2.

	Mean	Median	St. Dev	p5	p95
CAR(-2, 2)	1.76%	0.072%	9.62%	-7.83%	15.35%
CAR(3, 23)	-1.21%	-1.08%	14.32%	-19.65%	18.06%
CAR(3, 44)	-1.60%	-1.81%	19.53%	-29.24%	24.19%
Earnings growth	0.176	0.0369	1.774	-0.399	0.666
Book-to-market	0.635	0.444	1.0669	0.113	1.0451
Bidder size (book)	36356.23	1605.92	6345.88	104.453	194835
Log(bidder size)	14.601	14.289	2.290	11.556	19.09
Relative size	0.267	0.0596	0.700	0.00351	1.0788
Leverage (book)	0.548	0.561	0.207	0.199	0.902
Private target (%)	87.8		32.8		
Stock payment (%)	9.22		29.0		
Cash payment (%)	33.1		47.1		
Same industry (%)	31.1		46.3		
Tender offer (%)	4.81		21.4		
Toehold (%)	5.41		22.6		
Hostile (%)	0.204		4.48		
Withdrawn (%)	4.21		20.1		
Cross-Border (%)	55.3		49.8		

We observe 499 total deals, which is equivalent to an average of 23 deals per year. A temporal sample distribution can be found in Appendix Table A1, panel B. Our data is dominated by international acquisitions, with cross-border deals representing 55.3% of all announced deals. Unsurprisingly, most companies are growing moderately year-on-year prior to announcement. Acquiring firms prefer cash payments over stock payments, as 33.1% of firms are paying with cash, whereas only 9.2% is paid with stock. The rest is hybrid consideration structures paid with both stock and cash. The mean of Relative Size is 0.267, meaning that acquiring firms pursue small deals relative to their own size. This might suggest that acquirers pursue less established firms with good growth opportunities. We also observe that a large majority of targets are private companies, with 87.8% of all acquisitions being characterised as such. Acquisitions also tend to be cross-industry, as same-industry acquisitions only make up 31% of total deals. As expected, we observe that hostile takeovers have subsided over time, constituting only 0.2% of our sample. Although not in table 1, the average deal value far exceeds our constraints of $1 million or ≈ 9 million NOK. The average transaction value is 1,396 million NOK, which accumulates to 696,765 million NOK over the sample period.

5. Methodology

5.1 Estimating Abnormal Returns

Our overall analyses depend on the event study methodology, which is the standard for evaluating the impacts of corporate events on firm performance (Brown & Warner, 1985; Kothari & Warner, 2007). In practice, event studies are primarily used for two reasons: 1) test whether the market efficiently incorporates information, and 2) examine the impact of some event on shareholder wealth (Binder, 1998). Persisting abnormal returns after an event are inconsistent with the EMH, as securities are believed to adjust quickly to reflect new information. Event study methods are therefore convenient to provide key insights on acquisition returns as well as market efficiency (Brown & Warner, 1980; Fama, 1991).

We estimate abnormal returns over both short-term and long-term event windows. For the narrowest event windows of $T = [-2, 2]$ to $T = [3, 44]$, where $t = 0$ is the announcement date, we use the CAR approach as described by Brown and Warner (1985). The BHAR approach with matched firms is applied for the longer horizons of 1-3 years post announcement in line with Liu and Tu's (2021) approach. We seek consistency with previous findings and taking on these approaches are indeed in line with most literature on acquirer returns (Betton et al., 2008). The main concern within these event study techniques is determining whether the event period returns are abnormal by differing from *expected* returns (Brown & Warner, 1980). A question then becomes what model one should use as a benchmark for expected returns. In a comprehensive comparison, Dyckman et al. (1984) find that the single index version of the Risk Adjusted Model (market model) is superior when analysing daily stock prices. Again, using the market model as a return benchmark is consistent with relevant literature (see for example Moeller et al., 2004, 2005). Returns are then expressed as in eq. (1) below:

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it} \qquad (1)$$

$$E(e_{it} = 0) \qquad \sigma^2(e_{it}) = \sigma_{e_i}^2$$

where:

$R_{it} \equiv$ the actual return on security *i* on day *t*

$R_{mt} \equiv$ the market return on day *t*

e_{it} ≡ prediction error term for security *i* for day *t*

α_i, β_i ≡ firm-specific constants

Abnormal returns are expressed as the residual e_{it} of this model, with zero expectation and constant variance. Abnormal returns are estimated by simply taking the difference between actual and expected returns:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \tag{2}$$

By simply summing up all individual observations of AR within an event window (τ_1, τ_2), we can express CAR for any given deal as (MacKinlay, 1997):

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \tag{3}$$

Similarly, the BHAR can be expressed as (Betton et al., 2008):

$$BHAR_{it} = \prod_{t=1}^{T}(1 + AR_{it}) - 1 \tag{4}$$

There is some concern regarding the use of market indexes as return benchmarks when estimating abnormal returns over longer periods. Several researchers argue that using market indexes will impose several biases in the statistical estimations when applied over many years, mainly because of changes in the indexes over time (Barber & Lyon, 1997; Kothari & Warner, 1997). Brav (2000) also argues that statistical inference is hampered in long-term event studies due to abnormal returns being neither normally distributed nor independent. Lyon et al. (1999) suggest using non-event firms as benchmarks instead of market indexes or using calendar-time portfolios to avoid these issues. Benchmark firms are then selected based on firm-specific characteristics such as firm size.

5.2 Selection of Benchmark Firms

We follow the suggestion of Lyon et al. (1999) and the approach of Liu and Tu (2021), where one uses firms as benchmarks for calculating buy-and-hold abnormal returns based on firm-specific characteristics. We match firms in the event sample with non-event firms based on two selection criteria: (1) firm size (market capitalization) and (2) B/M value. All firms

are then categorised as potential matches if their market capitalization is within 70% to 130% of that of the acquiring firm. Each acquiring firm thus have a sample of potential matches. Each firm is then compared to the acquirer based on their B/M value if they have at least three years of complete stock data over the event window. The firm with the most similar B/M value to the acquirer is chosen as a benchmark for normal returns.

5.3 Model Specification

5.3.1 **Short-Term Models**

As mentioned, the OSEAX is used as the benchmark index for short-term estimation of abnormal returns using eq. (1). Eq. (1) is estimated over 252 trading days or approximately one trading year. The estimation window is given as: $T = [-259, -7]$, relative to that of the announcement of the M&A deal. Based on the estimated expected returns from the estimation window, abnormal returns are estimated using equation (2).

The relationship between earnings growth and acquisition returns are then formalised by employing a multiple regression analysis. We utilise an OLS regression of the form:

$$CAR(a,b) = \alpha + \beta_1 |EG|^- + \beta_2 |EG|^+ + Controls + \varepsilon \quad (5)$$

The dependent variable is the cumulative abnormal returns over the event period $[a, b]$. Based on our hypothesis of a non-linear relation between earnings growth and acquirer returns, we adopt a piecewise linear regression to allow for variation in the coefficients of earnings growth across firms with positive and negative earnings growth. We thus use the absolute values of negative earnings growth, $|EG|^-$, and positive earnings growth $|EG|^+$ as our main independent variables to capture potential asymmetric market reactions to acquisitions.

We also test the robustness of our results by employing a quadratic regression analysis as an alternative model specification. Quadratic regression terms allow for parabolic trends in the data and can unveil convex or concave best fit. We therefore test the following relationship:

$$CAR(a,b) = \alpha + \beta_1 EG + \beta_2 EG^2 + Controls + \varepsilon \quad (6)$$

As an additional robustness check, we analyse the effect of earnings growth in different earnings deciles by performing separate coefficient estimates for high and low-growth groups. We therefore formalise one last regression model of the form:

$$CAR(a,b) = \alpha + \sum_{i=1}^{4} \beta_i Decile_i + \sum_{i=6}^{10} \beta_i Decile_i + Controls + \varepsilon \quad (7)$$

In this regression, the main independent variable is $Decile_i$, which is an indicator variable taking on the value 1 for earnings growth decile *i*. The omitted group from this analysis is decile 5, which is the most neutral earnings growth group.

5.3.2 **Long-Term Models**

As implied in section 2.1, expanding event windows is a way to capture more long-term effects of the M&A that better reflects fundamental performance. Drawing from earlier discussions, we adopt the approach as suggested by Lyon et al. (1999) and create firm benchmarks. We also adopt the technique with calendar-time portfolios as described by Lyon et al. (1999) and proceed to use the CAR method to analyse long-term abnormal returns. Though we acknowledge that neither approach is perfect, evidence on acquirers' long-term stock performance is fundamental in understanding the role of earnings growth. The collective evidence from each analysis should therefore contribute to and complement the short-term analyses.

In similar fashion to our short-term analysis, we formalise the expected relationship between earnings growth and abnormal returns by employing a multiple regression analysis. We utilise two separate OLS regression models of the form:

$$CAR(a,b) = \alpha + \beta_1 |EG|^- + \beta_2 |EG|^+ + Controls + \varepsilon \quad (8)$$

$$BHAR(a,b) = \alpha + \beta_1 |EG|^- + \beta_2 |EG|^+ + Controls + \varepsilon \quad (9)$$

The dependent variables are the cumulative abnormal returns and BHAR over the event period $[a,b]$. In this case, we follow Liu and Tu (2021) by starting the event period at $t = +3$ and estimate returns over one, two and three trading years. Each trading year is assumed to be 253 days for simplicity. As such, our three event windows become $T_{1\,year} = [3,256]$, $T_{2\,years} = [3,509]$ and $T_{3\,years} = [3,761]$.

6. Results

6.1 Market Reactions to M&A Announcements

6.1.1 **Acquirers' Announcement Cumulative Abnormal Returns and Earnings Growth**

As an initial step to examine the relationship between an acquirer's earnings growth and abnormal returns upon an M&A announcement, we divide our sample into 10 deciles of earnings growth. We report the cumulative abnormal returns over a 5-day period, two days prior to and two days ensuing announcement. Table 2 below summarises acquirers' recent earnings growth and their returns enclosing the deal announcement event window for each earnings decile.

Table 2: Summary statistics of earnings growth and abnormal returns for each growth decile

This table presents descriptive statistics for the sample of Norwegian acquiring firms that announced M&As between 1997 and 2019, based on their earnings growth decile. This entails 499 announced deals. Acquirers are ranked in deciles based on their relative year-on-year earnings growth in the year prior to announcement. Abnormal returns are measured on the event window $T = [-2, 2]$ where $t = 0$ is the announcement date. We report mean, median and standard deviation for the two variables abnormal return and earnings growth.

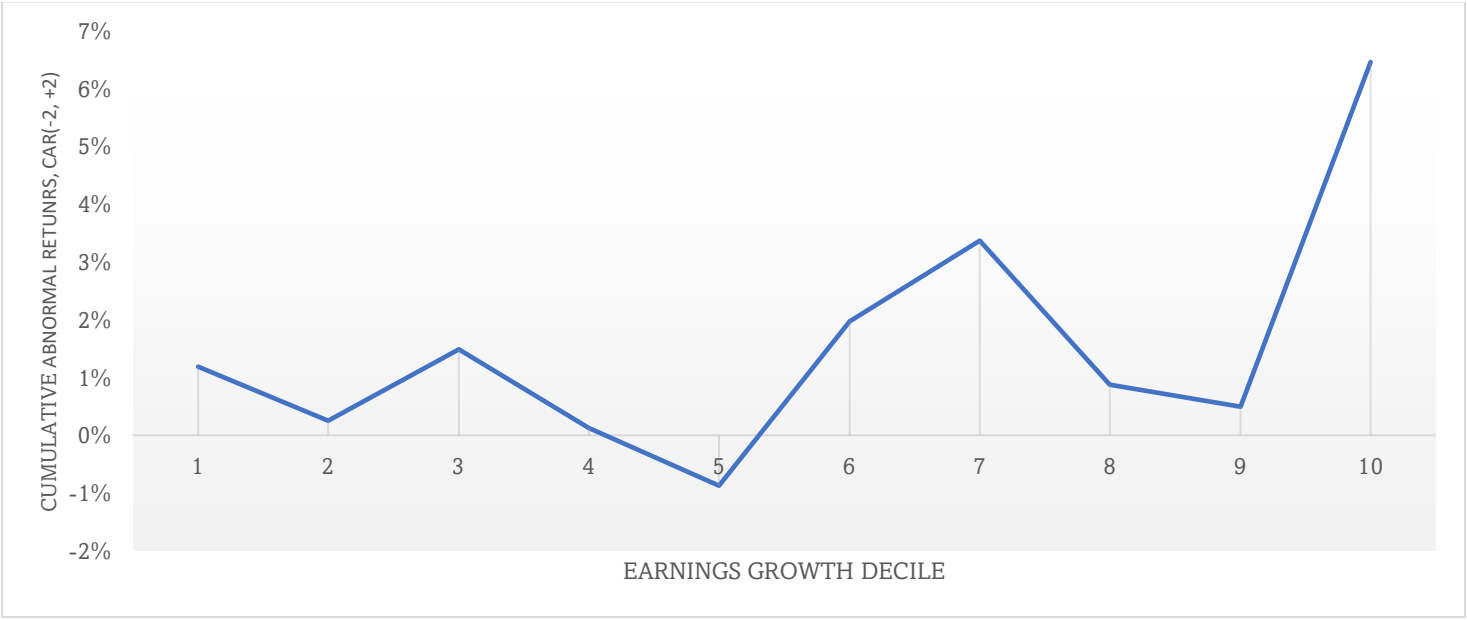
	Earnings Growth			Acquirer CAR(-2, 2)		
Earnings Growth Decile	Mean	Median	St. Dev	Mean	Median	St. Dev
1	-0.491	-0.391	0.446	1.184%	1.073%	8.212%
2	-0.0943	-0.0818	0.0333	0.619%	-0.222%	6.990%
3	-0.0309	-0.0287	0.0110	1.485%	0.678%	4.973%
4	0.00165	0.00251	0.00999	2.036%	-0.0178%	15.192%
5	0.0279	0.0265	0.00647	-0.872%	-0.0265%	10.196%
6	0.0573	0.0585	0.0112	1.973%	2.064%	7.024%
7	0.0933	0.0933	0.0113	3.370%	1.002%	9.133%
8	0.143	0.143	0.0164	0.0876%	0.673%	6.264%
9	0.224	0.216	0.0394	0.497%	0.518%	8.278%
10	1.88	0.666	5.367	6.459%	3.450%	13.760%

The mean of acquirers' growth ranges from -0.491 in decile 1, to 1.88 in decile 10, which shows that there is ample variation in the earnings growth for our sample firms. Table 2 also shows a strong difference in market reaction across different earnings deciles. The market reacts particularly strong to firms with very high growth (decile 10), and high moderate growth (decile 7). On the other hand, the market reacts more feebly to moderate growth (decile 5) and moderately low growth (decile 2). Lastly, it reveals that the market reacts more decisively on firms with the lowest earnings growth (decile 1), as it outperforms four of the other deciles, and earn an average CAR of 1.073% over the 5-day event window.

As a second step, we control for return variation within our sample by including variables for firm and deal-specific characteristics (see Appendix Table A6). We start by dividing earnings growth deciles into 3 earnings groups: we define low-growth acquirers if they are in the 1st to 3rd decile of growth, moderate-growth acquirers if they are in the 4th to 7th decile, and high-growth acquirers as 8th decile and above. We then perform a student's t-test of mean and the Wilcoxon signed rank test of median between the high and low-growth bidders. We observe significant differences between the groups. First, there are significant differences between low and high earnings growth (1% significance level). We also observe several firm-specific differences between acquirers with high and low growth. Unsurprisingly, high-growth acquirers tend to be smaller than low-growth acquirers. High-growth acquirers also tend to have a lower B/M value than low-growth acquirers. Both these results are consistent with the findings of Sudarsanam and Mahate (2003) in that P/E and B/M ratios are closely related and that both can be used to proxy glamour vs. value acquirers. B/M values tend to be smaller for high-growth companies, as they are priced higher, with expectations of high future growth. High-growth companies also tend to have more intangible assets, which often cannot be recognised in financial statements and contribute to lower B/M ratios (Barth et al., 2001). Furthermore, high-growth firms appear to have a higher leverage ratio than low-growth firms. They also pursue relatively larger deals than low-growth firms in terms of deal value.

We then proceed to plot acquirer CAR(-2, 2) against earnings deciles in figure 3. Liu and Tu (2021) report a U-shaped pattern in their data analysis, where announcement returns positively correlate with extreme low or extreme high prior earnings growth. We observe no such U-shaped pattern in our dataset, and it appears to be somewhat random which growth deciles achieve strong abnormal returns. There is seemingly some degree of correlation between deviation in earnings growth from the previous year and abnormal returns, but we cannot state that this is a uniform trend across the data. However, we do observe a trend in the median of each decile that acquirers perform worse in the low-growth deciles and better in the high-growth deciles. The outmost decile (10) seems to strongly outperform all other deciles. Overall, we observe a trend where higher earnings growth is associated with greater abnormal returns, but also where low-growth firms exhibit positive CARs.

Figure 3: Acquirers' mean acquisition abnormal announcement returns by earnings growth decile



Note: This graph shows the plot of mean cumulative abnormal returns around announcement, $T = [-2, 2]$, for each earnings growth decile. Acquirers are ranked in deciles based on their relative year-on-year earnings growth year-end prior to the announcement.

Figure 3 supports a notion that earnings growth and abnormal announcement returns appear to have a non-linear relationship. We therefore proceed as described in section "5.3.1 Short-Term Models" with a piecewise linear regression, eq. (5), to allow the coefficients of earnings growth to vary across firms with positive and negative earnings growth. The regression results presented in table 3 below, shows our attempt to capture the asymmetric market reactions to announcements made by acquirers with positive versus negative earnings growth.

Table 3: Cross-sectional regression results of acquirers' announcement abnormal returns

This table shows the regression results of acquirers' announcement abnormal returns based upon the following model: $CAR(a,b) = \alpha + \beta_1|EG|^- + \beta_2|EG|^+ + Controls + \varepsilon$, for event window T =[-2, 2], where $t = 0$ is announcement date. Regression (1) shows the regression of earnings growth on announcement returns. (2) shows the regression with absolute values of earnings growth. (3) includes independent variables from section 4.2. (4) further includes industry and year fixed effects. All independent variables are defined in section 4.2.

	(1)	(2)	(3)	(4)
Dependent variable		CAR(-2, +2)		
EG	0.00110			
	(0.45)			
$\|EG\|^-$		0.0224	0.00325	0.0112
		(1.05)	(0.15)	(0.46)
$\|EG\|^+$		0.00153	0.00131	0.000993
		(0.62)	(0.51)	(0.37)
Log(B/M)			0.000915	0.00736
			(0.19)	(1.26)
Stock Payment			0.0420**	0.0472**
			(2.73)	(2.83)
Cash Payment			0.00164	0.00103
			(0.17)	(0.10)
Private Target			0.00202	0.0169
			(0.13)	(1.01)
Relative Size			0.0306***	0.0244***
			(4.78)	(3.51)
Log(bidder size)			-0.00277	-0.00726*
			(-1.21)	(-2.25)
Leverage			0.0330	0.0258
			(1.41)	(0.92)
Same industry			-0.00678	-0.00900
			(-0.73)	(-0.87)
Tender offer			-0.0101	0.00827
			(-0.42)	(0.32)
Toehold			-0.00132	0.00196
			(-0.06)	(0.09)
Hostile			0.00582	-0.0134
			(0.06)	(-0.13)
Cross-border			0.0142	0.0171
			(1.63)	(1.77)
Constant	0.0174***	0.0158***	0.0211	0.0532
	(4.01)	(3.47)	(0.55)	(0.58)
Year FE	No	No	No	Yes
Industry FE	No	No	No	Yes
Observations	499	499	493	493
R-squared	0.000431	0.00290	0.0926	0.207

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

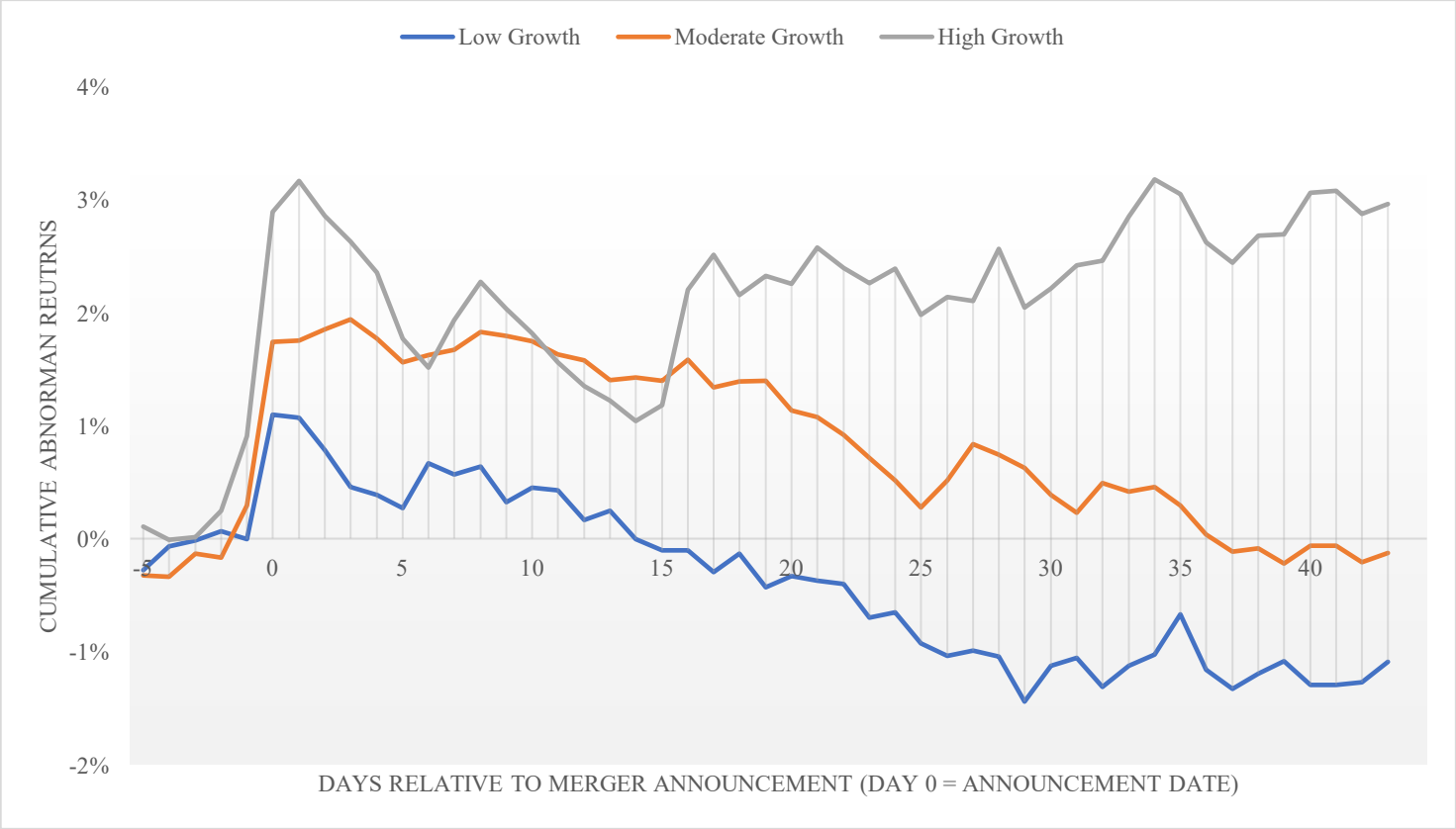
In regression (1), we test the relationship between the level of an acquirer's earnings growth and their abnormal announcement returns. We find that the coefficient of earnings growth (EG) is 0.00110, which is not statistically significant (t-value = 0.45). This is unsurprising, as we see from figure 3 that there is no apparent linear relationship in the data. In regression (2), we observe that $|EG|^+$ and $|EG|^-$ both have positive coefficients, although statistically insignificant (t-values of 0.62 and 1.05). As a result, we cannot infer that the coefficients on the EG variables differ from zero. This insignificant relationship between earnings growth and acquirer announcement returns also hold up when we control for deal and firm characteristics in regression (3) and year and industry fixed effects in regression (4). Overall, our results provide no evidence that changes in earnings are significantly related to acquirer announcement returns. On the other hand, controls for deal and firm characteristics reveal other factors which do contribute to determining announcement returns. We observe that the coefficients for stock payment (0.0420 and t-value = 2.73) and relative size (0.0306 and t-value =4.78) are positive and statistically significant. When we also control for industry and year fixed effects, the coefficient on bidder size is negative and statistically significant (-0.00726 and t-value = -2.25).

6.1.2 **Acquirers' Short-Term Post-Announcement Returns**

To test whether the initial positive returns to M&A announcements are due to a market overreaction, we further examine short-term abnormal returns. If such positive returns were to be consistent with a market overreaction to firms with different earnings, we would expect to observe a positive short-term reaction to the M&A announcement followed by a return reversal as investors adjust their beliefs in line with new information. Similarly, if we take this positive reaction to reflect investors' rational beliefs, we should not observe return reversals after the announcement. To analyse this potential effect, our post-announcement return analysis is performed over relatively short periods, one and two months (21 and 42 trading days). Such short event windows have an advantage in that a firm's underlying fundamentals are unlikely to change dramatically within such short periods, at least on aggregate. This means that if a price reversal exists after announcement, we can more accurately describe the effect and attribute it to mispricing at announcement. The disadvantage is that the results cannot be identified if the market is slow to adjust and correct itself. To make an initial analysis of potential mispricing at announcements, we plot the

cumulative abnormal return evolution from five days before an acquisition to 42 trading days after the announcement. We further separate acquirers into groups of high, moderate, and low growth acquirers based on their earnings deciles.

Figure 4: Acquirer CAR around M&A announcement for different earnings groups



Note: This graph shows cumulative abnormal return evolution from 5 days prior to announcement to 42 days after announcement for different earnings growth groups. Acquirers are ranked in deciles based on their relative year-on-year earnings growth year-end prior to the announcement. The three groups are defined: low growth is decile 1 – 3, moderate 4 – 7 and high 8 – 10.

Figure 4 clearly shows a clear reversal pattern for low-growth acquirers right after the announcement, whereas moderate-growth acquirers show a slower reversal pattern. In contrast, high-growth acquirers do not show an obvious pattern of reversal within our event window. We further examine this relation between abnormal returns and earnings through another cross-sectional regression, replacing the dependent variable with either CAR(3, 23) or CAR(3, 44). Table 4 presents the regression results:

Table 4: Cross-sectional regression results of short-term abnormal returns

The following table displays the cross-sectional regression results of short-term abnormal returns based upon the following model: $CAR(a,b) = \alpha + \beta_1|EG|^- + \beta_2|EG|^+ + Controls + \varepsilon$, for event windows $T = [3,23], [3,44]$, where $t = 0$ is announcement. Regression (1) and (2) shows cumulative abnormal return for each event window regressed against the absolute values of earnings growth. Regression (3) and (4) includes independent variables from section 4.2 and industry and year fixed effects. All independent variables are defined in section 4.2.

	(1)	(2)	(3)	(4)
Dependent variable	CAR(3, 23)	CAR(3, 44)	CAR(3, 23)	CAR(3, 44)
$\|EG\|^-$	0.0184	0.0204	0.00728	0.00477
	(0.58)	(0.47)	(0.20)	(0.09)
$\|EG\|^+$	-0.00264	0.00116	-0.00603	-0.000987
	(-0.72)	(0.23)	(-1.45)	(-0.17)
Log(B/M)			0.0159	0.0255
			(1.68)	(1.95)
Stock Payment			-0.0256	-0.0226
			(-1.01)	(-0.64)
Cash Payment			0.0229	0.0272
			(1.43)	(1.24)
Private Target			0.00891	-0.0393
			(0.35)	(-1.11)
Relative Size			-0.0113	-0.0278
			(-1.06)	(-1.90)
Log(bidder size)			-0.00827	-0.0124
			(-1.68)	(-1.82)
Leverage			0.0533	0.0414
			(1.24)	(0.70)
Same industry			-0.0229	-0.0350
			(-1.45)	(-1.61)
Tender offer			0.0334	-0.0314
			(0.85)	(-0.58)
Toehold			0.00244	0.0131
			(0.07)	(0.27)
Hostile			0.0286	0.00562
			(0.18)	(0.03)
Cross-border			-0.0219	-0.00999
			(-1.48)	(-0.49)
Constant	-0.0126	-0.0175	-0.0616	0.0433
	(-1.86)	(-1.89)	(-0.37)	(0.19)
Year FE	No	No	Yes	Yes
Industry FE	No	No	Yes	Yes
Observations	499	499	493	493
R-squared	0.00180	0.000539	0.0169	0.153

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Column (1) and (2) show that both $|EG|^+$ and $|EG|^-$ are unrelated to CAR(3, 23) and CAR(3, 44). No coefficient is significant over the 50% confidence level. This suggest that there is no systematic effect in return reversal for acquirers with positive and negative earnings growth. This result remains robust after controlling for deal and firm specific characteristics and fixed effects in column (3) and (4). This result is somewhat consistent with what we observe in figure 4 and the summary statistics from table 2. Figure 4 shows that the return reversal is occurrent for earnings deciles 1 through 7 (i.e., low, and moderate growth), though over different timeframes. Looking back at the summary statistics from table 2, we see that this return effect does not uniquely entail negative earnings growth, but both positive and negative earnings growth. Hence, for CAR(3, 44) we would not expect earnings growth, $|EG|^+$, to have a uniquely negative effect on abnormal returns. We would expect, however, $|EG|^-$ to be negative and statistically significant if earnings were related to return reversal.

We perform two additional tests of CAR(3, 23) and CAR(3, 44) which can be found Appendix Table A4, panel A and B. This is to see if the results change depending earnings growth groups. We observe that, for both CAR(3, 23) and CAR(3, 44), neither $|EG|^-$ or $|EG|^+$ have negative statistically significant coefficients for low or moderate-growth firms. Indeed, moderate-growth firms have a statistically significant positive coefficient for positive earnings growth. Hence, it does not appear as if the return reversal we observe is uniquely tied to earnings growth.

6.1.3 **Discussion of Short-Term Results**

i) Initial Market Reactions to Low vs. High-Growth Acquirers

Figure 4 indicates that the Norwegian market, on average, reacts positively to deal announcements from all growth deciles of acquirers. It also implies that the higher the earnings growth, the larger the initial abnormal returns. Lastly, there is a striking reversal-pattern in abnormal returns shortly after the announcement-date, especially for low and moderate-growth acquirers. At first glance then, the sample manifest return patterns that are consistent with previous findings on European acquirers generating low but positive announcement-date CARs (Goergen & Renneboog, 2004; Martynova & Renneboog, 2011).

Unlike Liu and Tu (2021), we find no statistically significant relationship between earnings growth, neither high nor low, and announcement abnormal returns with an event window of [-2, 2]. Considering the result holds up well against extensions of the regression model, our evidence suggests that no such relationship exists for public Norwegian acquirers. Given that we in figure 3 also do not see indications of a U-shaped relationship in our sample, the results are not surprising. Also, the results are inconsistent with some of the findings presented in section 2. Rau and Vermaelen's (1998) extrapolation hypothesis predict that past financial performance is the starting point for the market when assessing a deal. Because earnings growth has been shown to explain much variation in stock prices, it is not unlikely that such a metric is used by the markets to proxy past performance. Moreover, it is not unreasonable to think of a scenario where significant corporate events like M&As draw more attention to an acquirer, resulting in aggregation of irrational extrapolation. Just as predicted by the overoptimism hypothesis of Skinner and Sloan (2002), such a scenario would lead to higher returns for acquirers with high past earnings growth. There are several explanations as for why we do not observe such results which would be consistent with **H1a**. It could simply be due to a relatively small sample size of $N = 493$ vs. Liu and Tu's (2021) $N = 37{,}004$. Since short-term acquirer CARs are expected to be close to zero based on empirical findings and the sample variance is large, a relatively large sample size is required to get strongly significant results. A more economically sound explanation is that earnings growth is unrelated to a deal's value creation. The expected value of an M&A might be related to strategy-based synergies, agency factors or other sources of value which are not correlated to earnings growth in a meaningful way (Berkovitch & Narayanan, 1993). If the market is efficient in incorporating only deal-relevant information in its assessment of the announcement, the insignificant coefficients on $|EG|^{+}$ and $|EG|^{-}$ are to be expected. Statistically rejecting **H1a** though, is not in itself enough to infer the alternative that initial market reactions are rational and in line with efficiency. Nevertheless, efficiency and rationality are left as alternatives. The support for the latter hypothesis is further strengthened as the coefficients on most explanatory variables are insignificant and fail to explain CAR variations. This hints that markets might only consider factors contributing to post-deal value when assessing the deal rather than factors which, at least fundamentally, do not affect value creation. We leave further investigation of these alternatives to future researchers, as exploring potential synergies is beyond our scope. Still, we hold on to the

argument that our observed return patterns show clear signals of initial market overreaction to deal announcements.

ii) Method of Payment, Deal Size and Bidder Size

We see the need to comment further on some of the other variables from the [-2, 2] analysis. First, the coefficient on *Stock Payment* is significantly positive at 4.72%. This result is inconsistent with most theoretical predictions, as highlighted by Shleifer and Vishny (2003) through their market-timing/misvaluation hypothesis. All-stock offers should signal overvaluation to the markets with subsequent price declines, both because markets rationally interpret the signal and because the acquirer is fundamentally overvalued. However, table 1 shows that around 88% of targets in our sample are private companies. Eckbo (2009) emphasises that the market-timing hypothesis applies to public targets, whereas the negative effect of all-stock payment reverses for private targets. As previously mentioned, a positive effect of paying for private targets with equity potentially stems from monitoring and information related factors (Chang, 1998). Thus, markets react *positively* to all-stock offers for non-public targets, and our findings support the existence of a divergence between public and private target-effects from all-stock offers. Besides approving to the Norwegian market an already established effect, this result also gives us some assurance that the model produces credible estimates. Still, one should tread carefully when attributing hypotheses and effects to markets outside the ones where they are found. Although the sign (+) of *Stock Payment*'s coefficient is consistent with Chang's (1998) arguments, we thus test the relationship explicitly to infer if our results support his hypotheses. In Appendix Table A3 we test the relationship between abnormal returns and stock payment with private targets. The coefficient is positive at 0.0211, but statistically insignificant. However, the t-stat of 1.02 for the column (2) regression is quite high given only 45 observations. Hence, there are some indications in the data that there is a positive effect from paying with all equity when targets are private. As for **H2**, we are not able to significantly relate the effects of all-stock payment to differences in earnings growth between acquirers. These results are generally inconsistent with Shleifer and Vishny's (2003) argument that overpriced acquirers prefer all-stock payment. A simple explanation is that high earnings growth not necessarily translates to significant overvaluation, or that the sample size is simply too small. However, the evidence is unsurprising drawing from Eckbo's (2009) review. There, periods of high

valuations are not found to increase the use all-stock payments, undermining the predictions of overvaluation-based hypotheses.

Second, we observe a significant and positive coefficient on *Relative Size*, which measures the ratio of transaction value to market capitalization. Deals that are considered large with respect to the acquirers' value, are associated with positive market reactions. From empirical findings we anticipate a negative coefficient on *Relative Size*, since we expect greater deal size to create greater integration costs and more complexity in management (Alexandridis et al., 2013; Healy et al., 1992; Ramaswamy & Waegelein, 2003). Our results on short-term announcement returns do not support this complexity hypothesis. Also, the result is somewhat puzzling considering that the significant coefficient on *Log(Bidder Size)* (-) is consistent with previous literature finding a negative relationship between acquirer size and announcement returns (Moeller et al., 2004, 2005). Again, one explanation could be that the sample size is simply too small and hence is affected by a few large deals that deviate from empirical predictions. Another potential explanation is that markets only gradually reassess the announcement in line with several cited findings (Dutta & Jog, 2009; Rau & Vermaelen, 1998; Sudarsanam & Mahate, 2003). It is plausible that markets initially react positively to large deals, for example because large targets provide more collateral which leads to increased financing opportunities (Martynova & Renneboog, 2011). An event window of only [-2, +2] might then be too narrow to capture the subsequent downward reassessment due to complexity in realizing synergies. Indeed, in table 4 the coefficient on Relative Size turns negative both for [3, 23] and [3, 44], although statistically insignificant at 5%. This supports our notion that markets take some time to fully translate the relevant information into stock prices.

iii) Post-Announcement Return Reversal?

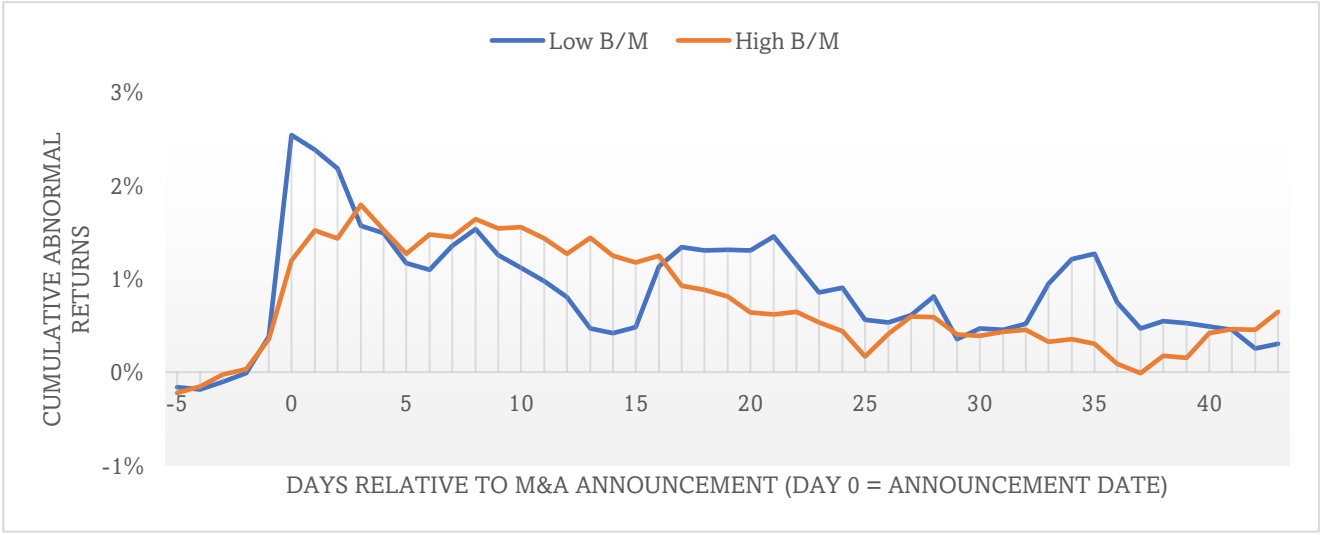
Even though figure 4 shows some signs of post-announcement return reversals for both low and moderate-growth acquirers, we find no statistically significant relationship between earnings growth and 1-month or 2-month post-announcement CARs (see table 4). Additionally, no other explanatory variable coefficient is statistically significant in either of the periods. We consequently do not find support for **H1b** which predicts a negative coefficient on $|EG|^{+}$ due to reassessment of expectations in the market. Although a negative sign is observed on the coefficients in column (3) and (4) of table 4, they are insignificant

and so we cannot infer they are different from zero. However, the insignificant results when increasing the event window is not entirely inconsistent with prior research. We have shown several studies with positive announcement-date returns that turn insignificant, for instance when increasing both to 15- and 60-days post announcement (Dutta & Jog, 2009; Georgen & Renneboog, 2004). Also, the results are consistent with a notion that markets initially overreact to a deal announcement before readjusting their expectations in the first few weeks/months after announcement. Hence, we provide some support for an overreaction hypothesis, though we cannot relate the phenomenon to earnings growth or any other deal characteristics. Altogether, our results show that the apparent positive reaction to acquisition announcements and the subsequent return reversal appear to be unrelated to earnings growth. We have no hard evidence to suggest that the return reversal we observe is related to varying earnings growth of acquiring firms.

iv) B/M Ratios and Abnormal Returns

H3 predicts that value acquirers (high B/M) exhibit lower returns than glamour acquirers (low B/M) around announcement. Figure 6 paint a picture seemingly consistent with this hypothesis, where low B/M acquirers seemingly experience greater announcement returns than acquirers in the high B/M deciles:

Figure 5: Acquirer CAR around announcement for different B/M groups



Note: This graph shows CAR evolution from 5 days prior to announcement to 43 days after announcement for different B/M groups. Acquirers are ranked in deciles based on their relative B/M ratio year-end prior to the announcement. The two groups defined: low B/M is decile 1-5, high B/M is decile 6-10.

In line with our predictions and previous findings, both groups in figure 6 show indications of initial overreaction. This overreaction is notably larger for glamour acquirers, as we by now would expect with extrapolation of past performance. However, the difference seems to centre on the announcement date itself, while the remaining return observations exhibit no systematic pattern of differences. Hence, we do not expect to find large statistical differences between them. Appendix Table A5 shows the t-test of mean and Wilcoxon's signed rank test of median for the returns of low vs. high B/M acquirers. We find no significant differences over any of the predetermined event windows, [-2, +2], [3, 23] and [3, 44]. **H3** is in essence an extension of **H1a**. Since we cannot statistically accept the latter, it is not surprising that we do not find conclusive statistical evidence on **H3.** As with the earnings growth results, we observe patterns consistent with our hypotheses that we cannot statistically prove with any reasonable level of confidence. This make our results inconclusive, further amplified by the fact that the observations in figure 6 is not consistent with an EMH hypothesis either where no drift is expected after announcement. We address the role of B/M further in the discussion of our long-term results, to get a more conclusive view on its overall impact.

Altogether, our short-term results indicate that there is a difference in market reactions to M&A announcements for acquirers with different earnings growth, with subsequent return reversals for low and moderate growth. Contrary to Liu and Tu (2021), we are not able to provide conclusive evidence on the role of earnings growth in acquisition announcements. We observe a parallel pattern for the B/M ratio's role in explaining acquisition returns. There is a tendency for overreaction to low B/M acquirers, followed by a reversal pattern in the CARs. Thus, we cannot provide conclusive evidence in line with Rau and Vermaelen's (1998) extrapolation hypothesis. We do, however, find significant evidence on the role of stock payments and bidder size, where each effect contributes to the initial positive response to M&A announcements. In the rest of section 6., we shift our focus to long-term results where we expect to see poor share performance for acquirers based on theory and previous empirical findings.

6.2 Post-Acquisition Long-Term Effects

Having demonstrated an indication of temporary mispricing at announcement for low and moderate-growth firms, with a consequent return reversal, we further examine the long-term effects of M&A announcements to examine how long such effects persist in the market. Liu and Tu (2021) mainly find that firms with negative growth over longer event windows exhibit lottery-like features that attract investors. Furthermore, they show that these firms tend to underperform up to three years after announcement, consistent with their initial overreaction. Consequently, to assess the stock traits of acquirers, we first evaluate the buy-and-hold distribution of firms, and then subsequently proceed to analyse the long-term relationship between acquirer returns and earnings growth for event windows up to three years after announcement.

6.2.1 **Acquirers' Long-Term Cumulative Abnormal Returns and Earnings Growth**

To further elaborate on the temporary mispricing that we observe around announcement for low and moderate-growth firms, we examine the distribution of buy-and-hold returns following announcement. This is to control whether acquirers with negative earnings growth exhibit other long-term stock features than acquirers with positive earnings growth. Appendix Table A7 presents the post-announcement buy-and-hold return distribution over the 12 months following announcement. Consistent with our results for low-growth acquirers, we observe that acquirers with negative earnings growth exhibit lower mean and median returns for the entire 12 months compared to positive earners. Both positive and negative-growth acquirers have comparable return volatility and skewness for the entire period. For example, in three months after acquisition, the standard deviation of returns is 23.85% for firms with positive earnings growth, compared to 23.21% for firms with negative earnings growth. The max return is 119.04% for acquirers with positive earnings growth, and 71.80% for acquirers with negative earnings growth. There is a trend indicating; acquirers with positive earnings growth have higher max returns and fatter tails in the return distribution. We observe a consistent pattern across the top 1%, 5% and 10% of returns; acquirers with positive earnings growth achieve higher abnormal returns. Similarly, acquirers with negative earnings growth experience more extreme downside returns. Liu and

Tu (2021) concludes that firms with negative earnings exhibit lottery-like features as these firms have higher volatility, higher skewness, and higher max returns across the event periods. In our sample, there is no evidence indicating that investors should be more attracted to acquirers with negative earnings growth, as they do not exhibit preferable long-term performance characteristics compared to positive-growth acquirers. Hence, we do not find evidence in the buy-and-hold distribution supporting rational investors being drawn to gamble on poorly performing firms.

We further investigate the relationship between earnings growth and post-acquisition returns, and for how long such a relation persists in the stock market. In figure 4 we observed a clear return reversal pattern, but we cannot statistically link it to earnings growth with confidence. We therefore examine longer horizon returns over one, two and three years following the M&A announcement. This involves both an analysis of the cumulative abnormal returns, and the buy-and-hold returns for the specified periods. The results are presented in Appendix Table A8. In panel A, we present the regression results for long-term post announcement CAR, while in panel B we present the results for BHAR.

In the CAR analysis, we observe that negative earnings growth is statistically significant and positive for each year. On top of that, the effect increases over each year. We find that the coefficients are 0.405 for year 1, 0.900 for year 2, and 1.383 for year 3. This indicates that negative earnings growth is significantly connected to long-term overperformance. This result is rather peculiar, as we observe mean abnormal returns -8.09%, -16.41% and -13.86% for acquirers with negative earnings growth, for year 1, year 2 and year 3 respectively. We would expect, consistent with Liu and Tu (2021) that if a relation between earnings growth and long-term abnormal returns existed, negative earnings growth would be connected to long-term underperformance. We report conflicting results across our tests, as in the BHAR analysis, we find no positive effect of negative earnings growth. There, the coefficient for negative earnings is negative for the two first years, and positive in the last, although not significant. The coefficients are -0.171, -0.00592 and 0.0102 (t-values of -0.98, -0.02 and 0.03 over year 1-3). We expect the results to be comparable across methodologies, and not directly opposed. Through a subsidiary robustness test, found in section 6.3.4, we find that the conflicting results are due to significant estimation differences between the BHAR and CAR methodologies. Hence, we are unable to confidently establish a link between long-term under-/overperformance and earnings growth.

6.2.2 **Acquirers' Size, Relative Size and Long-Term Underperformance**

There are also several other interesting results from the long-term analysis. First, we find evidence of a size effect where large acquirers tend to underperform up to three years after acquisition. The BHAR analysis returns coefficients of -0.06, -0.0836, and -0.0885 for bidder size in year 1, 2 and 3 respectively. This can be interpreted as a 1% increase in bidder size being associated with a 6% decrease in 1-year abnormal returns etc. This further supports Moeller et al. (2004) premise that large acquirers are poor acquirers. They argue that large firms experience significant shareholder wealth losses when announcing acquisitions, and this effect persists over time. Our results appear to support such a premise, that as firm size grows, the long-term abnormal returns are persistently negative and increasing in firm size.

Further supporting the idea of a size effect, we observe that firms who engage in deals with large relative size tend to underperform for up to three years after the deal. From the CAR analysis, we find coefficients for relative size of -0.127, -0.205 and -0.262, for year 1, 2 and 3 respectively. All coefficients are significant at least at 5% significance level. This indication of an effect is reciprocated in the BHAR analysis, where year 2 and 3 have negative coefficients, although none are significant. This is consistent with the findings of Alexandridis et al. (2013) where the negative association between acquirer size and gains to acquisition is driven primarily by target size. Although acquirers pay systematically lower premia and are less likely to overpay for larger targets, any potential benefits are likely outweighed by large acquisitions being more likely to fail in delivering expected synergies (Alexandridis et al., 2013). The complexity and intricacy inherent in large deals and the tendency to create losses, justify why investors persist in their negative outlook on large deals, even long after the deal is announced (Alexandridis et al., 2013; Moeller et al., 2004).

It is important to note that a variety of factors impact stock returns, especially as the time horizon is widened. There may be variables correlated with Relative Size that are omitted from the analysis, resulting in misleading coefficients. Still, we find support for the size effect documented by Moeller et al., (2004, 2005), offering a plausible explanation of observed return variation.

6.2.3 **Book-to-Market, Stock Payments and Long-Term Overvaluation**

The long-term results also provide some indication of a valuation effect, where overvalued acquirers tend to underperform post-acquisition. This is firstly highlighted by the fact that the CAR analysis returns positive and statistically significant coefficients for B/M ratio. Over the three years, we observe coefficients of 0.109, 0.153 and 0.0226, all significant at the 5% level. We can interpret these coefficients as a 1% increase in B/M ratio being associated with 10.9% increased abnormal returns in year 1 etc. all other variables equal. This is supported in the BHAR analysis, which reports a bit lower, but positive coefficients, although insignificant. The result that B/M value increases returns is unsurprising, and consistent with Rau and Vermaelen's (1998) suggestion that value acquirers outperform glamour acquirers. This is not only due to reversal of initial extrapolation, but also because glamour acquirers tend to act out in overconfidence in acquisition decisions (André et al, 2004). Even if the market is unaware of an overvaluation, acquiring managers are not. Hence, they capitalise on this information asymmetry in the short-term, before the relative overvaluation relationship is reversed as the market counterbalances the asymmetry of information (André et al., 2004; Rau & Vermaelen, 1998). This argument is exactly what observe in our data, where we saw low B/M firms provide high initial returns around announcement, followed by a significant return reversal, where high B/M firms performed better post-acquisition. This is then followed long-term, where high B/M firms are shown to outperform low B/M firms. Hence, the short-term analysis, combined with the cumulative evidence from the BHAR and CAR analysis provide significant indications on the tendency of glamour firms to underperform in the post-acquisition period, as according to our hypothesis **H3**.

Secondly, we find further evidence in support of the idea of underperformance related to overvaluation. The BHAR analysis shows that stock payment is connected to significant underperformance for all three years. We observe coefficients of -0.359, -0.326 and -0.561, for year 1, 2 and 3 respectively. The coefficients in year 1 and 3 are significant at the 1% level, whereas year 2 is significant at ≈ 6% (t-value of 1.88). We interpret these coefficients as; paying with stock is associated with 35.9% lower abnormal returns 1-year post-acquisition etc. Similarly, the CAR analysis provides lower, but negative coefficients in all three years. One potential explanation for these negative coefficients is, as earlier mentioned, that stock acquisitions signals that the market overvalues the firm's assets and that the firm

has exhausted its internal growth opportunities (McCardle & Viswanathan, 1994; Myers & Majluf, 1984). Stock payments should therefore be associated with negative long-term returns due to "overvalued acquirers [making] poor choice of targets in acquisitions and are unsuccessful in turning their substantial premerger relative overvaluation advantage into favourable terms in the consummated deal" (Fu et al., 2013, p.25). This in turn leads to a deterioration in operating returns and asset turnover. Hence, if stock payments are indicative of overvaluation of the acquirer, this justifies why stock payments are associated with long-term underperformance for the acquirer.

Finally, we should note that long-term return reversals potentially can be explained simply because M&A activity often coincide with hot markets. As Rosen (2006) points out, valuations are typically high around the periods where M&A activity is concentrated. Thus, by theories of mean reversion back to fundamentally sound values, subsequent stock price declines are to be expected.

6.2.4 **Inconsistencies in Long-Term Results**

Finally, before closing out this section, we see fit to comment further on some inconsistencies in the long-term results, not yet addressed. We observe some inconsistencies across methodologies and obscure results from the long-term analysis that may indicate low precision in our results. For example, in the CAR analysis, toehold is only statistically significant for 2-year CAR (t-value = -2.37). In the other years, toehold provide t-values far from any statistical significance (-0.50 in year 1 and -1.28 in year 3). We observe a similar effect, where in the CAR analysis, leverage is only statistically significant for year 3. These results do not replicate across methodologies either. Hence, these results become difficult to justify, as we would expect that if an effect existed, an effect would be consistent across event windows. This means an effect would be consistently visible across 1, 2, and 3 years, if the effect was justifiable in year 3, regardless of the effect being diminishing or growing over time as we move away from the M&A announcement. Some deal characteristic effects could potentially increase or become more prominent over time. An example is relative size when a firm struggles to incorporate the target into its operating structure and therefore performs significantly weaker in the years after the M&A announcement. However, other firm and deal-specific characteristic effects, such as leverage and toehold, are expected to have an immediate consistent effect and not a long-term effect which is not attributable for earlier periods. In the case of leverage, this is because leverage would provide reassurance of

quality acquisitions, as leverage produces more agency costs for management, and thus strengthens managements' efficiency in decision making. This effect would then be immediate, and potentially persist. However, it is unlikely that such an effect would require three years to materialise, and not materialise in any way earlier. This is because the fundamental underlying values of the acquiring firm is likely to change significantly from the pre-announcement state. Hence, as time moves away from acquisition, investors will value the firm based on other characteristics than those which we analyse, and we continuously lose accuracy in attributing long-term overperformance and underperformance of a firm to such characteristics. As this is not a thesis within the asset pricing literature, we do not attempt to find out what really explains these longer-term price movements. However, we still expect fundamentals to matter more and more as time goes by, in line with evidence from Rhodes-Kropf and Viswanathan (2004) and Rosen (2006), and our variables to matter less and less.

In summary, the long-term analysis provides no evidence for lottery-like features for firms with negative earnings growth. Contrary to Liu and Tu (2021), we therefore conclude that no investor should be more attracted to firms in earnings decline, as they do not exhibit preferable long-term performance characteristics compared to positive-growth acquirers. Disappointingly, there is a lack of satisfactory evidence on earnings growth from the BHAR and CAR analysis. Accordingly, from the conflicting evidence we are not able to confidently establish a significant link to long-term post-acquisition returns. We do, however, observe indications of a size effect, where large acquirers underperform in the years following an acquisition. Similarly, we observe a valuation effect, where overvalued acquirers tend to underperform following an acquisition. All our results appear to be rather model sensitive, and dependent on the benchmark for normal returns. Nonetheless, the collective evidence from our two approaches enhances our inference on post-acquisition returns and strengthens the evidence from our short-term analysis.

6.3 Robustness Checks

M&As are complex, and it is challenging to determine a market's appropriate and rational reaction to an acquisition announcement. A typical market reaction to announcement is increased trading volumes after the announcement (Smith et al., 1997). Additionally, analysts who cover a target firm tend to retain coverage of the merged firm, accentuating the interest surrounding the acquiring firm (Tehranian et al., 2014). In addition to deal and firm characteristics determining the outcomes of the deal returns, an announcement could lead to greater market efficiency through availability of additional public information. This consequently could lead investors to re-evaluate the fundamental values of the acquiring firm, and thus reflect not only the reaction to the M&A deal, but also other aspects of the acquirers' valuation. To control for other aspects of M&A reactions, we conduct several robustness controls to ensure the accuracy of our conclusions.

6.3.1 **Analysis with an Alternative Sample**

In an un-tabulated result, we find that high-growth acquirers tend to have a slightly higher percentage of deals withdrawn compared to moderate and low-growth acquirers. To ensure that withdrawn deals have no effect on our results, we replicate our baseline results using only completed deals. This removes 20 observations from the original sample. The results can be found in Appendix Table B2. Our initial results hold strong: both positive and negative earnings growth are insignificant for abnormal returns, both on announcement dates and short-term post announcement. On the other hand, it strengthens our evidence that upon announcement, relative size and stock payments are positive determinants of announcement returns, while relative size drive returns down over a longer horizon. We also strengthen the evidence on the overvaluation hypothesis, where increased B/M ratio is correlated with short-term overperformance.

6.3.2 Using Alternative Measures of Acquirer Performance Prior to M&As

To ensure that our results are not sensitive to our specific measurement and definition of earnings growth, we conduct several robustness tests using alternative definitions of earnings growth to capture firm performance prior to the M&A announcement. First, we use an alternative scalar to equity, we scale year-on-year change in earnings by the total book-value of assets. The results are reported in Appendix Table B3, panel A. Our results remain robust that stock payment and relative size determine announcement abnormal returns. In this test, bidder size has a negative coefficient and is statistically significant (t-value of 2.25). This implies that bidder size is negatively correlated with abnormal returns.

Our second test uses net operating result instead of net income as our determinant of firm performance. Results are presented in panel B. Like panel A, our results remain robust.

Our third test, instead of using earnings, we use the change in cash flows to measure the firms operating performance before announcement. Results are reported in panel C and remain robust.

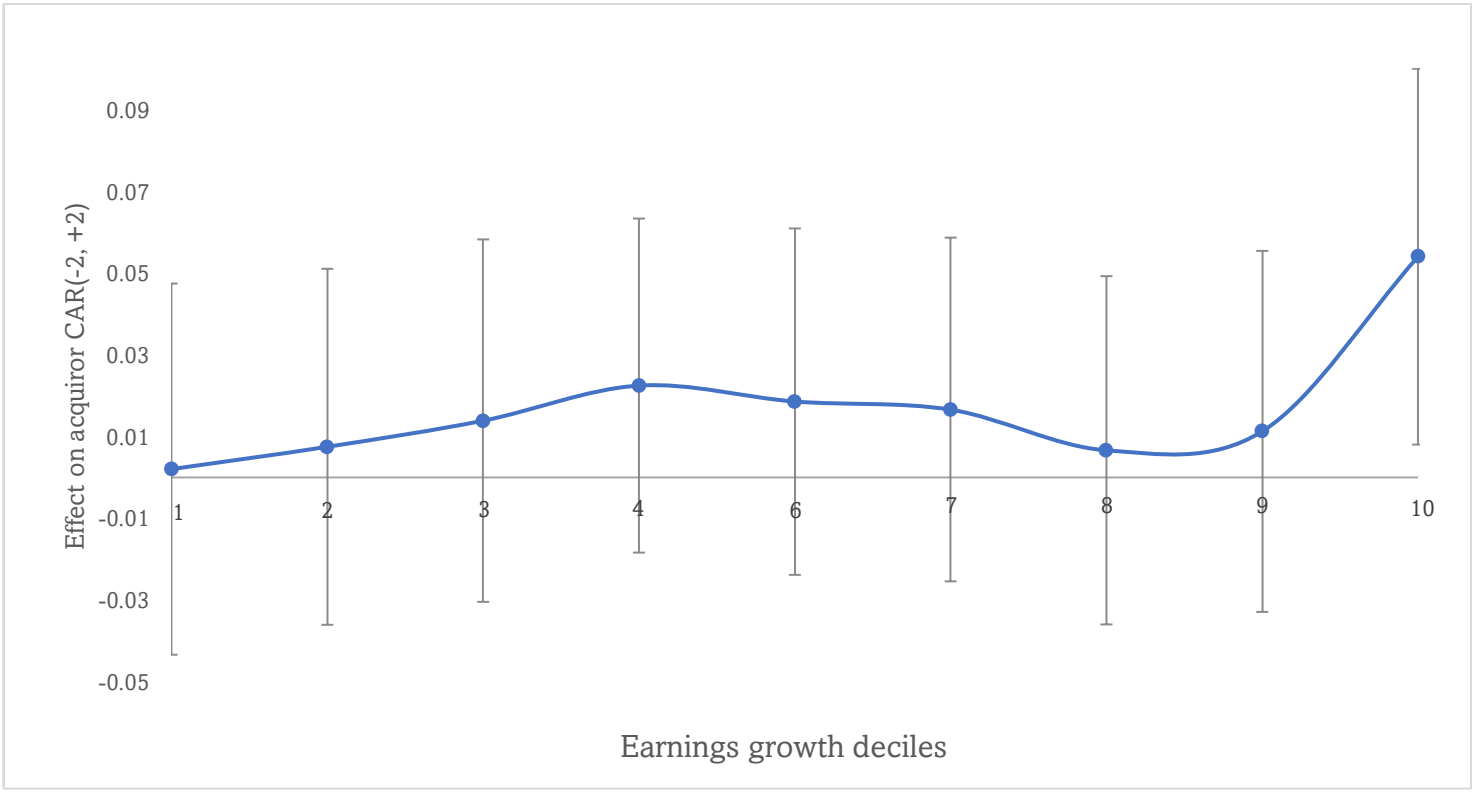
Our fourth and fifth test uses acquirer stock returns instead of accounting performance. We use the previous 6 and 12 months before the M&A announcement as different measures of firm performance. The results are presented in panels E and F. Again, our results remain robust.

6.3.3 Using an Alternative Model Specification

Liu and Tu (2021) argue that the relationship between acquirers' acquisition returns, and earnings growth is U-shaped. Our results provide no evidence of such a U-shaped relationship. However, to test the robustness of our results, we test our findings with an alternative model specification using a quadratic regression. Our model is specified in "5.5.1 Short-Term Models", equation (6). The results are presented in Appendix Table B4. We observe that earnings growth, EG, is statistically insignificant. Similarly, the coefficient of the quadratic term, EG^2, is -0.000398, which is negative and very low. This result is statistical at the 10% significance level (t-value = -1.69), providing further evidence that our results are robust and that there is no U-shaped pattern in our data.

As an additional test, we analyse the effect of each individual decile earning group by estimating the coefficients separately for each group. We perform the regression as specified in "5.3.1 Short-Term Models", equation (7). The omitted group is decile 5, which has the most neutral abnormal returns. The result is presented in figure 6 below. The results are robust after controlling for deal and firm characteristics, and industry and year. The relation between earnings growth and acquirers' acquisition returns are not U-shaped, which suggests that investors do not disproportionately overreact to M&A announcements for firms with significantly negative earnings growth in the Norwegian stock market.

Figure 6: The effect of earnings decile on acquirers' announcement returns



Note: This graph shows the plot of regression coefficients from the regression of each earnings growth decile on announcement abnormal returns, $T = [-2, 2]$. The regression model is detailed in section "5.3.1 Short-Term Models" equation (7). Acquirers are ranked in deciles based on their relative year-on-year earnings growth year-end prior to the announcement. The omitted variable is decile 5, with the most neutral abnormal returns. The results are interpreted as each earnings decile relative effect on abnormal returns. The error bars display the 95% confidence interval of each coefficient.

6.3.4 **Robustness Check of Long-Term Methodologies**

Following our conflicting results for earnings growth and abnormal returns across methodologies, we perform a subsidiary robustness test to understand the conflict. We therefore look at the return distributions across positive and negative earnings growth firms over the event windows up to three years. Looking at the results from Appendix Table B5, the apparent reason for the inconsistent results is seemingly that the CAR estimation provides significantly lower mean returns for acquirers with positive earnings growth than negative in all years. For example, over year 1, we observe a mean of -21.01% for acquirers with positive earnings growth, whereas -8.09% for acquirers with negative earnings growth. This effect is consistent across all three years. We also observe large discrepancies between the BHAR and CAR estimations, where CAR estimates acquirers with positive earnings growth to have – 21.01% abnormal returns, whereas BHAR estimates the same acquirers to have 0.6% abnormal returns over one year. This estimation difference is consistent for all three years, where CAR estimates acquirers with positive earnings growth to have significantly lower mean returns, larger return volatility, greater skewness and larger downside returns than the BHAR estimation. Similarly, the CAR estimations provide a significantly lower percentage positive returns for positive earnings growth firms, while providing comparable statistics across negative earnings growth firms. Looking back at the regression results from Appendix Table A8, an explanation for the positive coefficients on negative earnings growth might simply be that the CAR analysis overestimates "normal performance" for firms with positive earnings growth, leading to a relative overperformance of acquirers with negative earnings growth, and hence the positive coefficient. We therefore concede that the CAR analysis appears to suffer from "bad-model" problems as discussed by Fama (1998) and that the BHAR method might predict more accurately long-term performance of acquirers in this scenario. Another conclusion is that there is low precision across each model individually. This is indicative of the challenges related to long-term inference in event studies.

7. Conclusion

7.1 Summary

There has been much effort to explain the determinants of M&A success. Generally, M&A announcements have mixed short-term impact on acquirer's stock returns. In this thesis, we test the relation between earnings growth and abnormal returns, as Liu and Tu (2021) proposed to be U-shaped, by replicating their paper in the Norwegian stock market. For this purpose, a sample of 499 transactions with Norwegian public acquirers between 1997 and 2019 was used to estimate M&A announcement abnormal returns. By analyzing the characteristics of all deals, our approach was not able to establish evidence of a meaningful relationship between earnings growth and abnormal returns.

Similar to other European countries, Norwegian acquirers create small but positive announcement abnormal returns of 1.76%. The abnormal returns generated at announcement are quick to subside, as we find a clear return reversal pattern post-acquisition. This suggests that the market overreacts when a firm announces its acquisition, but rationally adjusts its expectations as new information becomes available. On the other hand, we did not find what Liu and Tu (2021) described as a U-shaped relationship between earnings growth and abnormal returns, where investors react disproportionately to firms with significant earnings decline. This result remained robust across several model specifications, and by testing each earnings decile's individual effect on abnormal returns. In fact, we were not able to prove a meaningful statistical relationship between earnings growth and abnormal returns at announcement, short-term or long-term for our sample firms.

We did, however, find evidence of several factors attributable to M&A announcement success. First, that stock payments are positively correlated with announcement abnormal returns, increasing abnormal returns by 4.72%, which is inconsistent with most theoretical predictions. However, the market-timing hypothesis generally applies to public targets, whereas 88% of our sample were private. Hence, a positive short-term effect of paying with stock potentially stems from monitoring and information related factors. We do observe a reversal long-term, where stock payments are linked to underperformance post-acquisition. Taken together with acquirers with low B/M ratios initially exhibit higher abnormal returns following deal announcements, with subsequent lower returns than high B/M firms over

longer time periods, we conclude that there is evidence of an overvaluation effect post-acquisition. Firms take short-term advantage of its overvaluation, while the market gradually counterbalances the asymmetry of information, leading to significant long-term value decline.

Secondly, we find indications of a significant size effect where large firms underperform post-acquisition. We document that 1% increase in bidder size leads to a 0.73% reduction in announcement abnormal returns. This result is consistent with previous literature, where small firms tend to create profitable acquisitions, whereas large firms make acquisitions that lead to losses for shareholders (Moeller et al., 2004). We further link this size effect to relative size as, the negative association between acquirer size and gains to acquisition is driven primarily by target size (Alexandridis et al., 2013). We show that relative size is significantly linked to long-term underperformance, further strengthening our conclusion of a size effect in acquisitions.

In conclusion, our thesis document that investors tend to react positively to M&A announcements, and thus generate positive abnormal returns. However, we find no evidence of behavioral bias influencing acquisition returns. Our findings are in line with the most established empirical findings on US, UK and Central-European takeover markets. With that being said, there are some tendencies in the data that hint of irrationality, especially in narrow event windows. This calls for further investigation into potential inefficiencies both in Norwegian and international takeover markets.

7.2 Caveats, Limitations and Suggestions for Further Research

Our study is prone to several caveats and limitations. First, the effect Liu and Tu (2021) display for US acquirers must be carefully evaluated before generalised. Stock markets are complex and tend to have very different characteristics based upon rules and regulation, difference in accounting principles and measures of success. We are also careful to compare across countries, as there are often differences in regulatory and social frameworks. Second, our small sample size makes statistical analysis challenging given the large variance in returns. Given the results portrayed in figure 4 for instance, we expect that a larger sample size would improve statistical inference. Third, this study may be subject to model biases. Event study techniques are sensitive to small changes in research design. Although we are following classical methodology, the OSEAX might not correctly adjust for risk for each firm. Similarly, for the BHAR method we are selecting benchmark comparable firms. These comparable companies are not likely to sufficiently adjust for firm specific risk. Hence, both our long-term return predictions may suffer from some bias. Lastly, we acknowledge potential weaknesses in our measure of earnings growth. Our estimates of earnings are based on non-normalised financial statements, meaning there is potential for inclusion of extraordinary items that investors would not include in their valuations. Furthermore, we base earnings growth calculations on year-end data. Thus, a deal can be announced up to 11 months after its estimated performance, and a firm's fundamental values could change substantially. The performance measure might then not accurately reflect the market view.

The relationship between earnings growth and M&A announcements are yet to be fully explored in financial literature. We therefore see potential for studies of larger sample size within the Nordic or European stock markets to determine the effect of earnings growth on abnormal returns. This will clarify whether the effect found by Liu and Tu (2021) can be generalised to some extent across financial markets. A well-known issue within M&A research is the focus on creating new models and finding new explanations rather than building on existing ones (King et al., 2004). We therefore encourage future researchers to follow up on the earnings relationship within a similar framework, further evaluating the applicability of our findings.

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Appendix

A Summary Statistics and Results

Appendix Table A1. Sample Selection and Distribution

Our sample consists of 499 deals announced between 1997 and 2019. Panel A describes the formation of our sample retrieved from Refinitiv's SDC Platinum database. Panel B displays the temporal distribution of the full sample.

Panel A: Sample selection

Sample filters	# of deals
Date announced: January 1, 1997, to December 31, 2019, and Norwegian acquirer	8197
Acquirer Public status: P	2375
Form of the deal: M, AM, AA	1268
Deal Value ($ mil): 1	720
Acquirer Primary Stock Exchange: O3, OS	684
Percentage of shares held at announcement: less than 50%	683
Return data on Børsprosjektet and at least two years of accounting data	499

Panel B: Temporal sample distribution

Year	Number of deals	Percent
1997	12	2.40%
1998	15	3.01%
1999	16	3.21%
2000	20	4.01%
2001	15	3.01%
2002	11	2.20%
2003	17	3.41%
2004	26	5.21%
2005	36	7.21%
2006	48	9.62%
2007	55	11.02%
2008	25	5.01%
2009	14	2.81%
2010	20	4.01%
2011	21	4.21%
2012	16	3.21%
2013	13	2.61%
2014	17	3.41%
2015	23	4.61%
2016	16	3.21%
2017	29	5.81%
2018	18	3.61%
2019	16	3.21%
Total	499	100%

Appendix Table A2. Correlation Matrix

The following table shows the correlation matrix. The sample consists of 499 deals announced between 1997 and 2019. Definitions of all variables are provided in section 4.2. ***, ** and * represents statistical significance at the 1%, 5% and 10% levels.

Var.	(1) Earnings Growth	(2) Book-to-Market	(3) Bidder Size	(4) Stock Payment	(5) Cash Payment	(6) Private Target	(7) Relative Size	(8) Leverage	(9) Same Industry	(10) Tender Offer	(11) Toehold	(12) Hostile	(13) Withdrawn	(14) Cross-Border
(1)	1													
(2)	-0.0408	1												
(3)	-0.0193	0.0394	1											
(4)	0.0285	0.0425	-0.0503	1										
(5)	0.0332	-0.0484	0.0628	-0.224*	1									
(6)	0.0202	0.0043	-0.0899*	-0.0926*	-0.0498	1								
(7)	-0.0173	0.203*	-0.0684	0.210*	-0.1055*	-0.0043	1							
(8)	-0.0309	0.0741*	0.222*	0.0295	-0.0103	-0.0662	-0.0001	1						
(9)	0.0364	0.0719	0.0708	-0.0343	0.0253	-0.0139	0.0893*	0.0624	1					
(10)	-0.0054	-0.0325	0.0959*	0.0255	0.0610	-0.517*	-0.0071	0.0394	-0.0294	1				
(11)	-0.0203	-0.0414	-0.0211	0.0463	0.0955*	-0.289*	-0.0050	0.0905*	-0.0265	0.277*	1			
(12)	0.0108	0.0035	-0.0078	-0.0143	0.0638	-0.120*	0.0119	-0.0362	0.0668	-0.0101	0.187*	1		
(13)	-0.0065	-0.0205	-0.0217	0.1057*	-0.0200	-0.379*	0.0442	-0.0237	0.0319	0.186*	0.0381	-0.0094	1	
(14)	-0.0459	-0.096*	0.0883*	-0.0898*	0.0492	0.0706	-0.0295	-0.0569	0.0894*	-0.0240	-0.0523	0.0403	-0.0324	1

Appendix Table A3. Cross-Sectional Analysis of Stock Payment and Private Targets

This table shows the OLS regression of acquirers' announcement returns if their final consideration structure offered is *Stock Only*. The table displays the relation between acquirers paying with stock payments and acquisition of private targets. Regression (1) shows the only private targets, while regression (2) includes all other independent variables, industry, and year fixed effects.

	(1)	(2)
Dependent variable	CAR(-2, 2)	CAR(-2, 2)
Private Target & Stock Payment	0.0752	0.211
	(1.90)	(1.02)
Constant	0.00925	0.460
	(0.26)	(0.38)
Independent variables	No	Yes
Industry FE	No	Yes
Year FE	No	Yes
Observations	46	45
R-squared	0.0757	0.802

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Appendix Table A4. Cross-Sectional Analysis of Short-Term Returns in Different Earnings Groups

This table presents the OLS regression analysis of acquirer short-term returns in different earnings groups. Panel A displays the CAR(3, 23) results, whereas panel B displays the CAR(3, 44). We define low-growth acquirers if they are in the 1st to 3rd decile of growth, moderate-growth acquirers if they are in the 4th to 7th decile, and high-growth acquirers as 8th decile and above.

Panel A: Cross-sectional regression of acquirer short-term returns, CAR(3, 23), in different earnings groups

	(1)	(2)	(3)
Earnings group	Low Growth	Moderate Growth	High Growth
Dependent variable		CAR(3, 23)	
$\|EG\|^-$	0.0546	2.588	0
	(1.04)	(0.72)	(.)
$\|EG\|^+$	0	0.750*	-0.0195*
	(.)	(2.26)	(-2.51)
Log(B/M)	0.0204	0.0146	-0.000135
	(1.60)	(0.73)	(-0.01)
Stock Payment	-0.0156	-0.0173	-0.0122
	(-0.36)	(-0.38)	(-0.20)
Cash Payment	0.0313	-0.0104	0.122*
	(1.51)	(-0.47)	(2.41)
Private Target	-0.00421	0.0307	0.0110
	(-0.12)	(0.76)	(0.16)
Relative Size	0.00129	0.00120	0.0281
	(0.04)	(0.06)	(0.73)
Log(bidder size)	-0.0157	0.00239	0.0133
	(-1.59)	(0.31)	(0.77)
Leverage	0.0688	-0.0689	0.211
	(0.88)	(-0.95)	(1.83)
Same industry	0.0277	-0.0598*	0.00126
	(1.23)	(-2.58)	(0.03)
Tender offer	0.00333	0.0322	0.124
	(0.46)	(0.60)	(1.01)
Toehold	-0.0122	0.0371	-0.0392
	(-0.24)	(0.64)	(-0.47)
Hostile	0	0	0.0934
	(.)	(.)	(0.40)
Cross-border	-0.00717	-0.0137	-0.0760*
	(-0.31)	(-0.61)	(-2.11)
Constant	0.190	-0.588*	-0.119
	(0.90)	(-2.21)	(-0.32)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	149	199	145
R-squared	0.545	0.136	0.342

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Panel B: Cross-sectional regression of acquirer short-term returns, CAR(3, 44), in different earnings groups

	(1)	(2)	(3)
Earnings group	Low Growth	Moderate Growth	High Growth
Dependent variable		CAR(3, 44)	
$\|EG\|^-$	0.00925	4.500	0
	(0.09)	(0.92)	(.)
$\|EG\|^+$	0	0.720	-0.0157
	(.)	(1.59)	(-1.42)
Log(B/M)	0.0194	0.000598	-0.00308
	(0.79)	(0.02)	(-0.08)
Stock Payment	-0.00407	-0.00619	-0.0755
	(-0.05)	(-0.10)	(-0.87)
Cash Payment	0.0332	-0.00152	0.0918
	(0.83)	(-0.05)	(1.39)
Private Target	-0.0579	-0.0702	0.0101
	(-0.88)	(-1.28)	(0.10)
Relative Size	0.0130	-0.0114	0.00475
	(0.23)	(-0.44)	(0.09)
Log(bidder size)	-0.00191	0.00205	0.0165
	(-0.10)	(0.20)	(0.68)
Leverage	-0.180	-0.122	0.242
	(-1.19)	(-1.24)	(1.48)
Same industry	0.0405	-0.0538	-0.0475
	(0.94)	(-1.70)	(-0.84)
Tender offer	-0.00335	0.0147	0.00926
	(-0.02)	(0.20)	(0.05)
Toehold	0.00434	0.0515	0.0373
	(0.04)	(0.65)	(0.31)
Hostile	0	0	0.150
	(.)	(.)	(0.45)
Cross-border	-0.0281	-0.0416	-0.00973
	(-0.64)	(-1.35)	(-0.19)
Constant	0.249	-0.555	0.00717
	(0.62)	(-1.53)	(0.01)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	149	199	145
R-squared	0.437	0.396	0.459

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Appendix Table A5: Abnormal Returns and Book-to-Market Ratio

The following table compares the abnormal returns among different B/M groups. We report three main statistics: mean, median and standard deviation. The last two columns represent statistical tests of difference in mean and median between the subsample of high and low B/M acquirers. We define low B/M acquirers if they are in the 5th decile or below. We define high B/M acquirers if they are in the 6th decile or above. ***, ** and * represents statistical significance at the 1%, 5% and 10% significance level respectively.

B/M group	Low B/M ratio			High B/M ratio			Test of difference	
	Mean (1)	Median (2)	Std. Dev (3)	Mean (4)	Median (5)	Std. Dev (6)	t-test (4) – (1)	Wilcoxon test (5) – (2)
Number of observations	*249*			*249*				
CAR(-2, 2)	0.0203	0.00770	0.104	0.0146	0.00698	0.0879	-0.00574	-0.00081
CAR(3, 22)	-0.0168	-0.0108	0.168	-0.0081	-0.0127	0.114	0.00874	0.00190
CAR(3, 43)	-0.0245	-0.0205	0.225	-0.0077	-0.0153	0.161	0.0168	0.0052

Appendix Table A6. Earnings growth and firm characteristics

The following table compares the main characteristics among the different earnings growth groups. We report 3 main statistics: mean, median and standard deviation. The last two columns represent statistical tests of difference in mean and median between the subsample of high and low-growth acquirers. We define low-growth acquirers if they are in the 3rd decile or below. We define high-growth acquirers if they are in the 8th decile or above. The rest is categorised as moderate-growth firms. ***, ** and * represents statistical significance at the 1%, 5% and 10% significance level respectively.

Earnings group	Low growth			Moderate growth			High growth			Test of difference	
	Mean (1)	Median (2)	Std. Dev (3)	Mean (4)	Median (5)	Std. Dev (6)	Mean (7)	Median (8)	Std. Dev (9)	t-test (7) – (1)	Wilcoxon test (8) – (2)
Number of observations	*150*			*199*			*150*				
CAR(-2, 2)	0.0108	0.00219	0.0671	0.176	0.00438	0.117	0.0258	0.00941	0.0979	0.0151	0.00722
CAR(3, 22)	-0.0113	-0.00734	0.0959	-0.0208	-0.0195	0.115	-0.00329	-0.00589	0.199	0.00937	0.00145
CAR(3, 43)	-0.0145	-0.00987	0.163	-0.0338	-0.0209	0.160	-0.00209	-0.0245	0.251	0.0165	0.0146
Earnings Growth	-0.207	-0.0741	0.316	0.0449	0.0394	0.0293	0.683	0.741	3.016	0.948***	0.8151***
Book-to-market	0.700	0.471	1.493	0.637	0.521	0.888	0.528	0.386	0.574	-0.192*	-0.085
Bidder Size	17029.49	1327.69	66586.27	74283.94	2824.172	210535	17397.78	998.216	96059.01	39695.48	-392.474**
Log(Bidder size)	14.417	14.099	2.280	15.362	14.851	2.465	14.062	13.814	1.899	-0.369*	-0.285**
Leverage	0.521	0.525	0.200	0.538	0.545	0.206	0.583	0.602	0.209	0.0732***	0.077***
Relative size	0.255	0.044	0.612	0.214	0.0548	0.463	0.335	0.0913	0.941	0.0423	0.0473**
Stock Payment	0.0838	0	0.278	0.0595	0	0.237	0.134	0	0.312	0.0403	0
Cash Payment	0.347	0	0.478	0.351	0	0.479	0.293	0	0.456	-0.0604	0
Toehold	0.0479	0	0.214	0.0476	0	0.214	0.0670	0	0.251	0.0201	0
Private Target	0.898	1	0.303	0.875	1	0.332	0.878	1	0.328	-0.0268	0
Cross-border	0.575	1	0.496	0.542	1	0.500	0.543	1	0.500	-0.0134	0*
Max return	0.142	0.111	0.121	0.115	0.094	0.0752	0.163	0.128	0.129	0.0166	0.017
Return volatility	0.0287	0.0254	0.0135	0.0248	0.0216	0.0105	0.0308	0.0268	0.0152	0.00126	0.0014

Appendix Table A7. Post-Acquisition announcement Buy-and-Hold Return Distribution for Acquirers with Different Earnings Growth

This table presents statistics of post-merger buy-and-hold returns for acquirers with positive and negative earnings growth. We report the following statistics: mean, median, standard deviation, skewness, percentage of holding period returns that are positive, max return, 99th, 95th, 90th, 75th , 25th , 10th , 5th and 1st percentile, and minimum return.

Holding period	1 Month		3 Months		6 Months		12 Months	
Earnings growth	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Mean	1.24%	-0.89%	3.40%	-0.97%	5.18%	-0.43%	8.50%	2.42%
Median	0.46%	-1.07%	1.35%	-1.10%	6.30%	3.49%	12.29%	14.26%
Std. Dev	15.85%	10.42%	23.85%	23.21%	35.55%	38.36%	54.37%	60.72%
Skewness	3.04	0.174	1.16	-0.041	0.42	-1.35	-0.127	-1.42
% Positive	51.53%	46.46%	52.84%	48.03%	59.83%	57.85%	59.39%	67.77%
Max	115.49%	36.82%	119.04%	71.80%	142.24%	90.37%	179.95%	102.56%
P99	43.57%	27.02%	86.23%	61.71%	119.51%	90.37%	165.50%	92.34%
P95	18.95%	16.54%	43.32%	39.16%	52.45%	43.34%	98.61%	77.27%
P90	14.76%	9.95%	29.46%	23.74%	43.56%	38.22%	69.54%	63.83%
P75	5.61%	5.05%	13.25%	10.42%	22.60%	22.32%	34.40%	43.58%
P25	-5.-25%	-6.11%	-8.54%	-12.53%	-13.30%	-16.52%	-19.63%	-17.38%
P10	-11.88%	-14.22%	-18.87%	-25.78%	-34.27%	-34.42%	-47.18%	-85.10%
P5	-14.76%	-18.64%	-29.90%	-38.58%	-51.44%	-55.65%	-88.52%	-131.82%
P1	-38.96%	-27.80%	-52.75%	-65.58%	-85.78%	-128.83%	-143.64%	-185.49%
Min	-58.79%	-27.98%	-76.03%	-83.69%	-126.17%	-185.70%	-209.26%	-238.98%

Appendix Table A8. Long-Term Post-Acquisition Returns

This section analyses the long-term effect on acquirer post-announcement returns. We include two regression analyses. In panel A, we use the cumulative abnormal return (CAR) adjusted by the market value-weighted index, OSEAX, measured over one, two and three years after the M&A announcement, as the dependent variable. In panel B, we use the buy-and-hold abnormal returns (BHAR), measured as the difference between acquirer buy-and-hold returns and that of a matched firm. Each acquiring firm is sorted with similar firms based on market capitalization, ranging from 70% to 130% of the market cap of the bidding firm. Then, each acquirer is given a match from the selection by the closest B/M value to the acquirer.

Panel A: Long-Term Analysis of Post-Acquisition Cumulative Abnormal Returns

	(1)	(2)	(3)
Dependent variable	CAR(1 Year)	CAR(2 Years)	CAR(3 Years)
$\|EG\|^-$	0.405*	0.900**	1.383**
	(2.22)	(2.99)	(3.22)
$\|EG\|^+$	0.0318	0.0433	0.0439
	(1.69)	(1.39)	(0.99)
Log(B/M)	0.109*	0.153*	0.0226*
	(2.41)	(2.05)	(2.13)
Stock Payment	-0.0803	-0.105	-0.220
	(-0.64)	(-0.51)	(-0.75)
Cash Payment	0.0939	0.215	0.322
	(1.13)	(1.57)	(1.65)
Private Target	-0.101	-0.267	-0.288
	(-0.80)	(-1.29)	(-0.98)
Relative Size	-0.127**	-0.205*	-0.262*
	(-2.59)	(-2.53)	(-2.27)
Log(bidder size)	0.0124	0.0857*	0.134*
	(0.51)	(2.16)	(2.37)
Leverage	-0.126	-0.640	-0.993*
	(-0.60)	(-1.85)	(-2.01)
Same industry	-0.0709	-0.0919	-0.0654
	(-0.87)	(-0.69)	(-0.34)
Tender offer	0.00625	0.223	0.483
	(0.03)	(0.71)	(1.07)
Toehold	-0.0847	-0.661*	-0.512
	(-0.50)	(-2.37)	(-1.28)
Hostile	-0.718	-0.730	-1.476
	(-1.03)	(-0.63)	(-0.90)
Cross-border	-0.0326	-0.0509	-0.0923
	(-0.43)	(-0.41)	(-0.52)
Constant	0.171	0.412	-0.217
	(0.21)	(0.31)	(-0.11)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	395	395	395
R-squared	0.333	0.344	0.342

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Panel B: Long-Term Analysis of Post-Acquisition Buy-and-Hold Abnormal Returns

	(1)	(2)	(3)
Dependent variable	BHAR(1 Year)	BHAR(2 Years)	BHAR(3 Years)
$\|EG\|^-$	-0.171	-0.00592	0.0102
	(-0.98)	(-0.02)	(0.03)
$\|EG\|^+$	0.0258	0.0286	0.00430
	(1.53)	(1.15)	(0.14)
Log(B/M)	0.0587	0.0443	-0.0127
	(1.39)	(0.71)	(-0.17)
Stock Payment	-0.359**	-0.326	-0.561**
	(-3.06)	(-1.88)	(-2.70)
Cash Payment	-0.0565	0.0250	0.0199
	(-0.72)	(0.21)	(0.14)
Private Target	0.0629	0.134	0.210
	(0.51)	(0.74)	(0.97)
Relative Size	0.0506	-0.0612	-0.0315
	(0.51)	(-0.66)	(-0.28)
Log(bidder size)	-0.0600**	-0.0836*	-0.0885*
	(-2.40)	(-2.26)	(-1.98)
Leverage	0.600**	0.174	-0.559
	(3.15)	(0.62)	(-1.63)
Same industry	-0.0616	0.0384	0.251
	(-0.80)	(0.34)	(1.81)
Tender offer	0.236	0.446	0.702*
	(1.22)	(1.56)	(2.01)
Toehold	-0.137	-0.423	-0.0817
	(-0.82)	(-1.70)	(-0.28)
Hostile	0.00762	0.910	0
	(0.01)	(0.98)	(.)
Cross-border	-0.0641	0.606	-0.0743
	(-0.09)	(0.59)	(-0.59)
Constant	1.843*	2.858*	2.079
	(2.41)	(2.53)	(1.53)
Controls	Yes	Yes	Yes
Industry*Year FE	Yes	Yes	Yes
Observations	355	355	338
R-squared	0.339	0.279	0.307

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

B Robustness Control

Appendix Table B1. Including **industry · year** fixed effects

This table replicates the baseline results of our analysis with the inclusion of an interaction term between industry and year. *Fixed Effects* entails both industry fixed effects and year fixed effects.

	(1)	(2)	(3)
Dependent variable	CAR(-2, 2)	CAR(3, 23)	CAR(3, 44)
$\|EG\|^-$	0.0579	0.0623	0.161
	(0.67)	(0.51)	(0.93)
$\|EG\|^+$	0.00185	-0.00705	0.0000162
	(0.44)	(-1.19)	(0.00)
Log(B/M)	0.00546	0.0122	0.0201
	(0.51)	(0.80)	(0.93)
Stock Payment	0.0303	-0.0127	-0.0172
	(1.19)	(-0.35)	(-0.34)
Cash Payment	0.0119	-0.00394	0.0151
	(0.79)	(-0.18)	(0.50)
Private Target	0.0261	0.00900	-0.0453
	(1.06)	(0.26)	(-0.93)
Relative Size	0.0311**	-0.00212	-0.0150
	(3.14)	(-0.15)	(-0.76)
Log(bidder size)	-0.00764	0.0000347	-0.00472
	(-1.42)	(0.00)	(-0.44)
Leverage	0.00133	0.0712	0.0331
	(0.03)	(0.98)	(0.32)
Same industry	-0.0317*	-0.0398	-0.0588
	(-2.06)	(-1.82)	(-1.92)
Tender offer	-0.00372	0.000773	-0.103
	(-0.09)	(0.01)	(-1.21)
Toehold	-0.0332	-0.0434	-0.0317
	(-0.92)	(-0.85)	(-0.44)
Hostile	0.0337	0.218	0.234
	(0.22)	(1.02)	(0.78)
Cross-border	0.0116	-0.0189	-0.0125
	(0.85)	(-0.97)	(-0.46)
Constant	-0.504	-0.342	0.677
	(-0.80)	(-0.38)	(0.54)
Fixed Effects	Yes	Yes	Yes
Industry*Year FE	Yes	Yes	Yes
Observations	493	493	493
R-squared	0.470	0.521	0.492

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Appendix Table B2. Robustness Test: Excluding Withdrawn Deals

This table replicates our baseline results, with the exclusion of deals that are categorised as *withdrawn* by SDC. This entails excluding 20 deals over the sample size.

	(1)	(2)	(3)
Dependent variable	CAR(-2, 2)	CAR(3, 23)	CAR(3, 44)
$\|EG\|^-$	0.0112	0.00798	0.000781
	(0.45)	(0.21)	(0.01)
$\|EG\|^+$	0.000585	-0.00617	-0.00139
	(0.21)	(-1.47)	(-0.24)
Log(B/M)	0.00651	0.0190	0.0283*
	(0.99)	(1.91)	(2.06)
Stock Payment	0.0474**	-0.0124	-0.00506
	(2.64)	(-0.46)	(-0.13)
Cash Payment	0.00203	0.0189	0.0265
	(0.19)	(1.14)	(1.16)
Private Target	0.0170	0.00309	-0.0617
	(0.88)	(0.11)	(-1.53)
Relative Size	0.0249***	-0.0150	-0.0322*
	(3.48)	(-1.38)	(-2.14)
Log(bidder size)	-0.00793*	-0.00839	-0.0135
	(-2.32)	(-1.62)	(-1.89)
Leverage	0.0268	0.0448	0.0338
	(0.90)	(1.00)	(0.54)
Same industry	-0.00914	-0.0220	-0.0364
	(-0.84)	(-1.35)	(-1.60)
Tender offer	-0.00370	0.0394	-0.0500
	(-0.13)	(0.90)	(-0.82)
Toehold	0.000662	-0.00772	0.00108
	(0.03)	(-0.21)	(0.02)
Hostile	-0.0216	0.270	-0.0203
	(-0.21)	(0.17)	(-0.09)
Cross-border	0.0193	-0.0216	-0.00886
	(1.92)	(-1.42)	(-0.42)
Constant	0.399***	-0.105	0.0127
	(3.65)	(-0.63)	(0.06)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	473	473	473
R-squared	0.217	0.178	0.159

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Appendix Table B3. Robustness test: Using Alternative Measures for Firm Performance

The following tables replicates our baseline results while using alternative measures for firm performance as the main independent variable. In panel A, we use the year-on-year growth in earnings and use an alternative scaler to measure (EG1) as the growth in earnings divided by the book value of assets. In panel B, we measure earnings growth (EG2) as the growth in income as the change in operating income divided by the book value of equity. In panel C, we use cash flows to measure recent firm performance and compute the (CFG) as the growth in operating cash flows divided by the book value of assets. In panel D and E, we use the firms recent stock returns prior to the M&A announcement as a measure of firm performance. We compute the 6-month and 12-month returns respectively.

Panel A: Using earnings adjusted by total assets as measure of firm performance

	(1)	(2)	(3)
Dependent variable	CAR(-2, 2)	CAR(3, 23)	CAR(3, 44)
$\|EG1\|^-$	0.0348	0.0233	0.0324
	(0.92)	(0.40)	(0.40)
$\|EG1\|^+$	-0.00149	-0.00614	-0.00206
	(-0.50)	(-1.36)	(-0.33)
Log(B/M)	0.00333	0.0167	0.0248
	(0.55)	(1.78)	(1.92)
Stock Payment	0.0472**	-0.0275	-0.0231
	(2.84)	(-1.08)	(-0.66)
Cash Payment	0.000506	0.0233	0.0274
	(0.05)	(1.46)	(1.25)
Private Target	0.0184	0.00869	-0.0390
	(1.10)	(0.34)	(-1.10)
Relative Size	0.0245***	-0.0116	-0.0281
	(3.53)	(-1.09)	(-1.92)
Log(bidder size)	-0.00722*	-0.00814	-0.0122
	(-2.25)	(-1.65)	(-1.80)
Leverage	0.0214	0.0495	0.0403
	(0.76)	(1.14)	(0.67)
Same industry	-0.00857	-0.0222	-0.0345
	(-0.83)	(-1.41)	(-1.59)
Tender offer	0.00902	0.0336	-0.0305
	(0.35)	(0.86)	(-1.59)
Toehold	0.000783	0.00193	0.0116
	(0.03)	(0.05)	(0.24)
Hostile	-0.00819	0.0268	0.00879
	(-0.08)	(0.17)	(0.04)
Cross-border	0.0164	-0.0220	-0.0103
	(1.70)	(-1.49)	(-0.50)
Constant	0.340***	-0.0627	0.0386
	(3.12)	(-0.38)	(0.17)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	493	493	493
R-squared	0.212	0.169	0.154

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Panel B: Using operating result adjusted by book value of equity as measure of firm performance

Dependent variable	(1) CAR(-2, 2)	(2) CAR(3, 23)	(3) CAR(3, 44)
$\|EG2\|^-$	-0.0000818	-0.000323	-0.000106
	(-0.52)	(-1.34)	(-0.32)
$\|EG2\|^+$	0.00805	-0.00161	0.00484
	(1.47)	(-0.19)	(0.42)
Log(B/M)	0.00524	0.0164	0.0261*
	(0.84)	(1.70)	(1.97)
Stock Payment	0.0434*	-0.0268	-0.0253
	(2.58)	(-1.04)	(-0.71)
Cash Payment	0.000956	0.0231	0.0277
	(0.09)	(1.45)	(1.26)
Private Target	0.0175	0.00882	-0.0396
	(1.05)	(0.34)	(-1.12)
Relative Size	0.0248***	-0.0113	-0.0278
	(3.58)	(-1.06)	(-1.90)
Log(bidder size)	-0.00766*	-0.00828	-0.0125
	(-2.42)	(-1.70)	(-1.87)
Leverage	0.0138	0.0495	0.0353
	(0.48)	(1.13)	(0.59)
Same industry	-0.00815	-0.0225	-0.0344
	(-0.79)	(-1.43)	(-1.58)
Tender offer	0.00711	0.0326	-0.0321
	(0.28)	(0.83)	(-0.60)
Toehold	0.00346	0.00387	0.0140
	(0.15)	(0.11)	(0.29)
Hostile	-0.0228	0.0222	-0.00229
	(-0.23)	(0.14)	(-0.01)
Cross-border	0.0166	-0.0222	-0.0101
	(1.72)	(-1.50)	(-0.50)
Constant	0.352***	-0.0584	0.0487
	(3.25)	(-0.35)	(0.21)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	493	493	493
R-squared	0.214	0.168	0.154

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Panel C: Using cash flow growth adjusted by book value of assets as measure of firm performance

Dependent variable	(1) CAR(-2, 2)	(2) CAR(3, 23)	(3) CAR(3, 44)
$\|CFG\|^-$	-0.0000907	-0.000304	-0.0000758
	(-0.57)	(-1.26)	(-0.23)
$\|CFG\|^+$	0.0366	0.0709	0.165
	(0.75)	(0.95)	(1.60)
Log(B/M)	0.00301	0.0165	0.0241
	(0.49)	(1.76)	(1.87)
Stock Payment	0.0448**	-0.0327	-0.0348
	(2.64)	(-1.26)	(-0.97)
Cash Payment	0.000736	0.0239	0.0288
	(0.07)	(1.49)	(1.31)
Private Target	0.0181	0.00793	-0.0406
	(1.08)	(0.31)	(-1.15)
Relative Size	0.0252***	-0.0109	-0.0267
	(3.63)	(-1.03)	(-1.83)
Log(bidder size)	-0.00719*	-0.00749	-0.0106
	(-2.23)	(-1.52)	(-1.57)
Leverage	0.0189	0.0482	0.0380
	(0.67)	(1.11)	(0.64)
Same industry	-0.00843	-0.0215	-0.0328
	(-0.82)	(-1.36)	(-1.51)
Tender offer	0.00561	0.0281	-0.0418
	(0.22)	(0.72)	(-0.77)
Toehold	0.00402	0.00497	0.0166
	(0.18)	(0.14)	(0.35)
Hostile	-0.0272	-0.00337	-0.0533
	(-0.27)	(-0.02)	(-0.25)
Cross-border	0.0157	-0.0232	-0.0129
	(1.62)	(-1.57)	(-0.63)
Constant	0.339***	-0.0794	-0.00254
	(3.09)	(-0.47)	(0.01)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	493	493	493
R-squared	0.211	0.170	0.158

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Panel D: Using the prior 6 months of returns before announcement as measure of firm performance

Dependent variable	(1) CAR(-2, 2)	(2) CAR(3, 23)	(3) CAR(3, 44)
|Past 6-month returns|$^{-}$	-0.00411	0.0478	0.177*
	(-0.10)	(0.79)	(2.13)
|Past 6-month returns|$^{+}$	0.0766	-0.0883***	-0.113***
	(0.80)	(-6.33)	(-5.89)
Log(B/M)	0.00453	0.0198*	0.0240*
	(0.78)	(2.35)	(2.06)
Stock Payment	0.0466**	-0.0160	-0.0161
	(2.75)	(-0.65)	(-0.47)
Cash Payment	0.00101	-0.0160	0.0128
	(0.10)	(-0.65)	(0.61)
Private Target	0.0168	0.0190	-0.0185
	(1.00)	(0.77)	(-0.55)
Relative Size	0.0246***	-0.00879	-0.0233
	(3.55)	(-0.87)	(-1.68)
Log(bidder size)	-0.00723*	-0.0111*	-0.0161*
	(-2.26)	(-2.38)	(-2.51)
Leverage	0.0214	0.0688	0.0575
	(0.77)	(1.69)	(1.03)
Same industry	-0.00963	-0.0179	-0.0275
	(-0.93)	(-1.19)	(-1.33)
Tender offer	0.00881	0.0205	-0.0412
	(0.34)	(0.55)	(-0.80)
Toehold	0.00259	0.00847	0.0184
	(0.11)	(0.26)	(0.40)
Hostile	-0.0137	0.0282	0.0138
	(-0.14)	(0.19)	(0.07)
Cross-border	0.0167	-0.0209	-0.00859
	(1.73)	(-1.48)	(-0.44)
Constant	0.347***	-0.0560	0.0264
	(3.17)	(-0.35)	(0.12)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	493	493	493
R-squared	0.211	0.245	0.237

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Panel E: Using the prior 12 months of returns before announcement as measure of firm performance

Dependent variable	(1) CAR(-2, 2)	(2) CAR(3, 23)	(3) CAR(3, 44)
|Past 12-month returns|$^{-}$	0.00570	0.0898	0.224*
	(0.16)	(1.62)	(3.00)
|Past 12-month returns|$^{+}$	-0.0121	-0.0497*	-0.0893**
	(-0.80)	(-2.17)	(-2.89)
Log(B/M)	0.00389	0.0168	0.0173
	(0.66)	(1.89)	(1.43)
Stock Payment	0.0475**	-0.0269	-0.0214
	(2.85)	(-1.06)	(-0.63)
Cash Payment	-0.000518	0.0203	0.0238
	(-0.05)	(1.28)	(1.11)
Private Target	0.0182	0.00837	-0.0364
	(1.09)	(0.33)	(-1.06)
Relative Size	0.0247***	-0.0134	-0.0320*
	(3.56)	(-1.27)	(-2.24)
Log(bidder size)	-0.00760*	-0.00775	-0.0114
	(-2.37)	(-1.59)	(-1.73)
Leverage	0.0242	0.0685	0.0611
	(0.86)	(1.62)	(1.07)
Same industry	-0.00936	-0.0224	-0.0320
	(-0.90)	(-1.43)	(-1.51)
Tender offer	0.00814	0.0357	-0.0236
	(0.32)	(0.92)	(-0.45)
Toehold	0.00408	0.00745	0.0228
	(0.18)	(0.22)	(0.49)
Hostile	-0.00734	0.0583	0.0714
	(-0.07)	(0.38)	(0.35)
Cross-border	0.0172	-0.0181	-0.00441
	(1.78)	(-1.24)	(-0.22)
Constant	0.0636	-0.0778	-0.00129
	(0.55)	(-0.44)	(-0.01)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	493	493	493
R-squared	0.211	0.185	0.200

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Appendix Table B4. Robustness Test: Using a Quadratic Regression Analysis

This table reproduces the baseline results of our analysis of announcement and short-term acquirer CAR, with the inclusion of a quadratic term for earnings growth.

	(1)	(2)	(3)
Dependent variable	CAR(-2, 2)	CAR(-2, 2)	CAR(-2, 2)
EG	0.0117	0.00884	0.0126
	(1.61)	(1.20)	(1.62)
$(EG)^2$	-0.000340	-0.000246	-0.000398
	(-1.55)	(-1.10)	(-1.69)
Log(B/M)		0.000495	0.00416
		(0.10)	(0.67)
Stock Payment		0.0411**	0.0446**
		(2.67)	(2.67)
Cash Payment		0.00206	0.000950
		(0.22)	(0.09)
Private Target		0.00193	0.0182
		(0.12)	(1.09)
Relative Size		0.0311***	0.0249***
		(4.88)	(3.60)
Log(bidder size)		-0.00258	-0.00753*
		(-1.13)	(-2.37)
Leverage		0.0256	0.0107
		(1.06)	(0.37)
Same industry		-0.00592	-0.00811
		(-0.64)	(-0.79)
Tender offer		-0.0112	0.00609
		(-0.47)	(0.24)
Toehold		0.000200	0.00607
		(0.01)	(0.27)
Hostile		-0.00192	-0.0290
		(-0.02)	(-0.29)
Cross-border		0.0134	0.0155
		(1.53)	(1.61)
Constant	0.0166***	0.0217	0.354**
	(3.80)	(0.57)	(3.27)
Year FE	No	No	Yes
Industry FE	No	No	Yes
Observations	499	493	493
R-squared	0.00522	0.0948	0.215

t statistic in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Appendix Table B5. Return Distribution for CAR and BHAR Analysis

This table presents statistics and return distribution of long-term CAR and BHAR for firm with positive and negative earnings growth. Panel A displays the return distribution for CAR over one, two and three years, while panel B displays the same for BHAR. We report the following statistics: mean, median, standard deviation, skewness, percentage of returns that are positive, max return, 99th, 95th, 90th, 75th , 25th , 10th , 5th and 1st percentile, and minimum return.

Panel A: Return distribution for long-term CAR

	CAR(1 Year)		CAR(2 Years)		CAR(3 Years)	
Earnings growth	Positive	Negative	Positive	Negative	Positive	Negative
N	257	139	257	139	257	139
Mean	-21.01%	-8.09%	-78.91%	-16.41%	-48.08%	-13.68%
Median	-17.34%	-7.82%	-60.82%	-14.96%	-35.37%	-13.67%
Std. Dev	72.21%	64.51%	172.45%	143.04%	121.81%	101.47%
Skewness	-1.22	-0.73	-1.66	0.174	-1.47	0.17
% Positive	35.80%	34.88%	34.24%	45.32%	30.74%	46.04%
Max	176.03%	215.68%	276.24%	555.73%	225.59%	403.24%
P99	151.03%	116.71%	257.45%	308.88%	183.83%	209.22%
P95	82.61%	95.47%	141.90%	226.65%	107.88%	160.33%
P90	54.56%	58.10%	82.35%	143.76%	71.92%	92.68%
P75	14.21%	29.46%	26.75%	62.72%	18.59%	48.17%
P25	-47.74%	-42.91%	-133.36%	-96.08%	-96.74%	-74.71%
P10	-96.69%	-67.81%	-288.50%	-191.96%	-176.77%	-136.12%
P5	-136.12%	-18.64%	-402.94%	-223.79%	-260.45%	-167.85%
P1	-304.70%	-125.18%	-772.25%	-442.07%	-545.64%	-296.09%
Min	-364.94%	-238.97%	-913.22%	-489.11%	-598.01%	-307.46%

Panel B: Return distribution for long-term BHAR

	BHAR(1 Year)		BHAR(2 Years)		BHAR(3 Years)	
Earnings growth	Positive	Negative	Positive	Negative	Positive	Negative
N	229	127	229	127	229	127
Mean	0.68%	-9.11%	-9.92%	-10.39%	-20.89 %	-5.34%
Median	-2.12%	-4.38%	-5.34%	-5.25%	-11.79%	-3.73%
Std. Dev	59.27%	64.42%	93.32%	73.03%	116.16%	81.64%
Skewness	0.35	-0.98	-0.44	-1.42	0.40	-0.74
% Positive	48.03%	47.24%	46.72%	44.88%	39.30%	46.46%
Max	210.04%	174.10%	252.51%	189.70%	493.08%	161.09%
P99	168.16%	108.27%	182.47%	139.38%	290.25%	152.15%
P95	113.50%	75.43%	128.01%	91.18%	149.25%	119.02%
P90	67.55%	65.88%	98.88%	77.28%	93.33%	90.56%
P75	30.63%	26.32%	45.43%	31.98%	40.33%	45.27%
P25	-36.50%	-37.84%	-56.21%	-48.48%	-72.14%	-39.90%
P10	-62.20%	-89.53%	-135.12%	-86.63%	-180.00%	-101.56%
P5	-98.04%	-115.62%	-187.36%	-129.99%	-218.85%	-150.05%
P1	-123.42%	-246.39%	-303.47%	-268.60%	-294.77%	-236.14%
Min	-207.55%	-255.15%	-312.31%	-317.42%	-341.75%	-285.54%