# THE CONSOLIDATION OF THE GLOBAL BREWING INDUSTRY AND WEALTH EFFECTS FROM MERGERS AND ACQUISITIONS

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**ABSTRACT**

*The brewing industry has recently experienced increased merger activity. This paper analyzes the short-term wealth effects of horizontal mergers and acquisitions on acquirers in the brewing industry. Based on a sample of 69 takeover announcements between 1998 and 2010, significant positive announcement returns were identified. In addition, the study finds significant positive returns for domestic transactions as well as cross-border deals involving targets in emerging markets. Other identified drivers of short-term success include transaction size, acquirer size and the target's public status. Furthermore, significant negative rival effects are identified across leading brewing groups, when missing a potential M&A opportunity.*

**JEL:** G14, G34, Q14

**KEYWORDS:** Mergers and Acquisitions, Brewing Industry, Announcement Returns, Acquirers, Industry Rivals, Event Study

## INTRODUCTION

Over the last decades, the wealth implications of mergers and acquisitions (M&A) have been widely discussed in empirical M&A research.Studies focusing on short-term announcement effects unambiguously conclude that M&A create value for shareholders of target companies (Bradley et al., 1988). However, the situation is not as clear-cut, as a closer look at returns to acquiring companies shows a different pattern: While overall acquirer returns average around zero (Bruner, 2002), industry specific event studies provide mixed findings of negative abnormal acquirer returns, positive abnormal returns or acquirer returns that are not significantly different from zero. Besides measuring the performance of the merging firms, there is also growing interest in the wealth effects of M&A on other firms from the same industry. Existing evidence shows that rival companies gain at the M&A announcement due to positive information signaling effects (See Eckbo (1983), Fee and Thomas (2004), Sharur (2005), Song and Walking (2000)). Towards the turn of the last century, many industries including the brewing industry,

have experienced a sharp increase in M&A activity. Consolidation has and continues to be a major trend in the sector as multi-national breweries seek to expand their activities into new emerging markets. At the same time, declining mature markets (in particular Western Europe) and resulting pressure on profit margins have encouraged brewers to engage in M&A, in order to gain in scale and benefit from synergies. In contrast to many other sectors, the production, distribution and marketing of beer is characterized by a relatively high fixed cost base, resulting in high levels of operational leverage (Earlam et al., 2010) providing larger brewers with material size advantages. Moreover, increased size has enabled brewers to exercise a significant amount of market-power (Schwankl, 2008), as larger brewers are able to negotiate favorable terms with their suppliers and benefit from greater bargaining power for negotiations with retail customers. Hence, it is not surprising that the global beer market today is dominated by large national/multinational brewers rather than local, regional brewers. The four largest brewers Anheuser-Busch Inbev, Heineken, SABMiller and Carlsberg ("the big four") control about 50% of the global beer

market. Despite rising market concentration, competition among the large brewing groups has remained fierce (Iwasaki et al., 2008). Going forward, many industry experts predict that the consolidation process will continue and that the "big four" will increase their control to 75% of the global beer market (Jones, 2010). As sector debt levels are expected to decrease further, research analysts are certain that M&A will remain a major theme in the coming years, as brewers will continue their quest for suitable M&A targets (Earlam, et al., 2010). In the light of these specific industry characteristics and the recent developments in the sector, the question arises whether the global synergy and efficiency potential of M&A transactions are reflected by capital markets in the form of abnormal stock price reactions to acquiring and close rival companies. Even though the global beer industry has gone through significant consolidation and seen a lot of M&A in recent years, empirical evidence remains scarce.

Therefore, the aim of this study is to fill this research gap and provide empirical evidence for investors and managers of beer companies. In contrast to previous research, our study determines the short-term performance of brewing companies based on a global dataset, uses a multi-factor model (Fama-French 3 Factor model) to determine statistically reliable indications of short-term performance, and analyses a comprehensive list of deal, acquirer and target characteristics for their impact on the short-term wealth effect to acquiring companies. Moreover, our study specifically analyzes rival effects among the "big four". The objective of the study is twofold: Firstly, we aim to update and extend previously published announcement effects on acquirers in the brewing industry. The main focus lies in analyzing short-term return patterns in order to detect and categorize determinant variables. Secondly, we aim to provide empirical evidence regarding M&A announcement effects among the "big four" as well as the value implications to rivals.The remainder of this paper is structured as follows: Section 2 gives a brief overview of the relevant literature and outlines the derived hypotheses. Section 3 provides details on the applied methodology as well as the sample selection procedure. The following section 4 presents the empirical results and elaborates on the derived hypotheses. Finally, section 5 summarizes the findings and concludes.

## LITERATURE REVIEW

While researchers unambiguously conclude that overall the announcements of mergers and acquisitions have positive value effects, Bradley et al. (1988) find that the short-term value creation is mostly attributed to the shareholders of target firms, which benefit from premiums paid by acquirers. In contrast, studies, that analyze acquirer returns, provide evidence of short-term value losses: Examining 4,265 M&A transactions between 1973 and 1998, Andrade et al. (2001) report insignificant negative returns to acquiring companies during a 3-day event window surrounding the announcement date of the transaction. Likewise, Loughran and Vijh (1997) document short-term acquirer returns that are overall negative, or insignificant. After reviewing 44 separate studies, investigating short-term value effects on acquiring companies, Bruner (2002) comes to the conclusion that on average abnormal returns for acquirers are essentially zero. In addition to cross-industrial studies, numerous industry specific analyses, in many cases seem to confirm the general results: Beitel et al. (2004) report negative abnormal acquirer returns for banks, while Akdogu (2009) and Berry (2000) find negative acquirer revaluations for the telecommunications and electric utilities industry, respectively. At the same time, alternative evidence identifies certain industries where acquirers are able to realize significant positive short-term returns. For example Mentz and Schiereck (2006) using a sample of 201 M&A transactions in the automotive supply industry document significant abnormal returns to acquirers of +1.6% during a 10-day event window and argue this finding to be the result of the extraordinary synergy potential in the industry perceived by capital markets. Similarly, Choi and Russel (2004) report positive abnormal returns to acquirers in the construction industry. Obviously, cross-industrial studies cover industry specific divergences, which result from the unique industry logic of value chains.

Empirical research also investigates the impact of M&A on rival firms. Overall, findings show positive as well as negative effects on rivals: On the one hand, rival companies may benefit from the M&A announcement due to a positive signaling effect regarding industry attractiveness and future takeover activity (Eckbo, 1983), (Song & Walkling, 2000). At the same time a merger in the industry decreases the number of competitors and thus increases the likelihood of collusion, which may lead to greater monopoly rents to rival firms (Eckbo, 1983), (Shahrur, 2005). Moreover, Snyder (1996) argues that rival firms may benefit from greater buyer power due to increased competition among suppliers, which may lead to lower input prices. On the other hand, rival firms may be affected by negative competitive effects as a result of more-intense competition in the industry due to a new, more-efficient combined firm (Eckbo, 1983). Overall, the documented positive effects outweigh the negative competitive effects: For example, Eckbo (1985) reports positive announcement effects to rivals for horizontal transactions. Similar results are found by Song and Walking (2000) in a study including horizontal and non-horizontal transactions. More recent studies by Clougherty and Duso (2009), Fee and Thomas (2004) and Shahrur (2005) confirm these results. As mentioned above empirical research on M&A in the brewing industry remains scarce and primarily focuses on the US brewing industry. The specific topics addressed in the studies focus on technological change in the sector (Kerkvliet et al., 1998), its tendencies towards concentration (Lynk, 1985), (Adams, 2006), the determinants and motives for horizontal M&A (Tremblay & Tremblay, 1988), as well as competition in the industry (Horowitz & Horowitz, 1968). More recently, Ebneth and Theuvsen (2007) analyze the short-term value effects of M&A to acquirers using event study methodology. Based on a sample of 29 cross-border transactions involving European acquirers from 2000-2005, they find insignificant positive acquirer returns of 0.9% in the 5-day event window surrounding the announcement date of the transactions.

With this paper, we aim to contribute to and extend existing literature with respect to geographical scope and methodology applied. First, we provide an analysis using a dataset, that in addition to cross-border transactions also includes domestic acquisitions and overall the merger wave of recent years. This database enables us to cover the complete M&A-cycle where usually later transactions significantly differ from the early ones. Second, we use a multi-factor (Fama French 3-factor model) model to determine and measure abnormal performance, which is then tested for significance using parametric and non-parametric statistical methods as well as multivariate regression analyses. Our main research interest is concentrated on the following aspects:

Acquirer Announcement Effects

As pointed out above, previous event studies focusing on single industries predominantly report negative acquirer returns. On the other hand, certain industries have been identified as outlier industries reporting positive abnormal acquirer returns. Given the particularities of the brewing industry and its development over the last few years, we expect M&A in the sector to be a feasible measure to realize synergy- and efficiency gains. Accordingly, we assume the capital markets to reflect the industry-specific synergy potentials, resulting in positive short-term value effects to acquirers. Since our study is based on a larger dataset than used by Ebneth and Theuvsen (2007) and additionally considers global as well as domestic transactions, we assume significant positive abnormal returns to acquiring brewers.

Analysis of Determinants of Acquirer Returns

While various studies focus on the impact of geography on short-term performance, the reported results are mixed: Several studies on cross-border M&A have found significant positive value gains to investors of acquiring firms around the announcement date (see e.g. Zhu and Malhotra (2008), Goergen and Renneboog (2004), Morck and Yeung (1992)). On the other hand, there have also been studies documenting negative or insignificant gains to acquirers involved in cross-border M&A (see e.g. Datta and Puia (1995) and Eckbo and Thorburn (2000)). Negative acquirer returns are also reported for

transactions involving targets in emerging market economies (Williams & Liao, 2008). In case of the brewing industry, Ebneth and Theuvsen (2007) find insignificant positive acquirer returns for cross-border transactions. However, their sample is restricted to 29 transactions. Due to the continuous decline in beer volumes in many mature markets, we regard cross-border M&A as a viable strategic option to diversify into international markets and thus expect significantly positive abnormal returns to acquirers. In particular, we assume acquirer returns to be positively impacted if the targets are based in emerging market economies and expect to find significant differences compared to domestic transactions.

The brewing industry has seen a significant increase in transaction volumes in recent years. Given the particular characteristics of the sector, increased company size provides brewers with a material competitive advantage. Analyzing technological change and economic efficiency in the U.S. brewing industry, Kerkvliet, et al. (1998) report substantial increases in economies of scale. Consequently, it can be argued that the acquisition of big targets will significantly contribute to the success of a transaction due to greater potential for economies of scale and revenue and/or cost synergies. On the other hand, the integration of larger targets may be more difficult than for small targets (Hawawini & Swary, 1991). In addition to target size, the size of the acquirer may also influence the success of a transaction. Comprehensive studies by Asquith et al. (1983), Jarrell and Poulsen (1989) and Moeller et al. (2003) find a negative impact of acquirer size on acquirer returns. Moeller et al. (2003) argue that managers of larger companies are more likely to overestimate their own abilities. Due to the fact that larger companies may benefit from bigger cash reserves and might need to face less hurdles in the execution of M&A transactions, the authors argue that managers of larger companies are more likely to engage in M&A transactions that are not always beneficial to the company. Consequently, we expect to find significant differences in abnormal returns between large and small acquirers

Over the last few years, the brewing industry has experienced a sharp increase in M&A activity and seen strong industry consolidation. As a consequence, the competitive landscape has materially changed as the "big four" today control more than 50% of global beer volumes. While the sector is expected to further consolidate in the future, it is becoming increasingly difficult to find suitable targets (Gibbs et al., 2010). We assume the changes in market structures and concentration to have an impact on acquirer returns and expect to find significant differences in abnormal acquirer returns over time.

Several studies analyze the impact of the method of payment on acquirer returns. Myers & Majluf (1984) argue that bidders prefer to pay using stock when they believe that the market overvalues their shares and on the other hand prefer using cash, when they regard their stock as undervalued. Similarly, Martynova and Renneboog (2006) suggest that the means of payment used is an important signal of the quality of the target firm and its potential synergy value. They argue that a cash offer by the bidding company signals a willingness to pay off target shareholders in order to avoid sharing future cash flows and bear the sole risk of the combined firms. On the other hand, an all-equity offer signals the willingness to keep the target shareholders involved in the merged company and share its risk. The theoretical framework behind the mentioned signaling effects is supported by the results of different studies (see e.g. Brown and Ryngaert (1991) and Wansley et al. (1983)) that report a significantly negative market reaction following the announcement of equity offerings, in contrast to positive announcements returns in the case of cash offers. We expect to find similar results for the brewing industry.

The acquisition of privately held companies accounts for the majority of M&A transactions in the brewing industry. The general consensus among researchers is that bids for privately held companies generate higher bidder returns than bids for publicly held companies. Martynova and Renneboog (2006) argue that, in the case of privately held targets, bidders are likely to benefit from price discounts as compensation for buying a comparably illiquid stake. At the same time, they see advantages due to the fact that private companies usually have fewer shareholders, which facilitates negotiations. These theoretical assumptions are confirmed in studies from Moeller et al. (2003) and Faccio et al. (2006) who

report substantially higher announcement returns to acquirers for bids on privately held targets as opposed to bids on public firms. Consequently, we expect to find similar results for the brewing industry.

In a study focusing on short-term value effects of acquirers Haleblian and Finkelstein (1999) determine a positive relation between the number of completed transactions of an acquirer and the magnitude of the acquirer's abnormal return. They argue that with each completed transaction, acquirers gain experience in the integration of targets, which can be, leveraged in future transactions. In case of the brewing industry, which is dominated by large brewing groups that frequently engage in M&A activities, we expect to find greater returns for bidders with transaction experience.

Announcement and Rival Effects among the "Big Four"

The global beer market is dominated by the "big four". Given the strong competition among them and due to the increased difficulty to find suitable targets, we expect to find positive acquirer returns if one of the "big four" announces an M&A transaction. At the same time, we expect the remaining three rival companies to be negatively impacted by the announcement as they are put into a disadvantageous competitive position by missing out on a potential M&A opportunity in a fairly concentrated market.

## DATA AND METHODOLOGY

The sample of mergers and acquisitions for the event study is drawn from the Securities Data Corporation (SDC)/ Thomson One Banker Deals database and the Merger Market M&A database. It includes all worldwide M&A events announced between January 1st, 1998, and September 1st, 2010. The total number of M&A deals is reduced to yield only those transactions meeting the following criteria:

1. At the time of the transaction, acquirer and target companies both had active operations in the brewing industry.

2. The acquiring company has been publicly listed for at least 250 days prior to the announcement of the transaction.

3. The total transaction value accumulates to at least USD 50 million.

4. The completion of the transaction leads to a change of control in the target; Prior to the announcement of the transaction the bidder holds less than 50% in the target company, following the transaction the bidder owns a controlling stake in the target company.

5. The transaction has been successfully completed.

In addition, the transactions were validated by a press research using the Factiva database as well as company websites in order to ensure that all transactions are horizontal and the announcement dates provided by the databases are correct. Moreover, acquirers with multiple transactions on the same day were removed from the dataset. The described selection criteria result in a final sample of 69 transactions. The frequency distribution of the transactions over time is provided in Table 1. While the number of transactions is spread fairly even over the years, the average transaction size varies strongly from 268 USD mil. to 11.973 USD mil. due to a number of high-profile transactions such as InBev's acquisition of Anheuser-Busch (52 USD bil.), Heineken and Carlsberg's takeover of S&N (USD 15 bil.) and Heineken's recent acquisition of Femsa Cerveza (USD 5.7 bil). In terms of geography, more than 80% of the transactions involve acquirers that are based in Europe.

The relevant daily stock prices, market capitalizations and local market indices for acquirers were downloaded from the Thomson Datastream database. Acquirer returns are calculated using the Datastream Total Return Index, which adjusts the closing share prices for dividend payments as well share issuances or repurchases. Moreover, global value and growth indices for large and small cap companies from data and index provider Russell serve as proxies for the Fama French model.

Table 1: Sample Overview: Descriptive Statistics

| | | | Avg. Trans. Val. | Trans. Val. | Acquirer Region - Number of Deals | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **Deals** | **(%)** | **(USD mil.)** | **(USD mil.)** | **Europe** | **Americas** | **Asia** | **RoW** |
| 2010 | 1 | 1.4 | 5,700 | 5,700 | 1 | | | |
| 2009 | 4 | 5.8 | 737 | 2,946 | 2 | | 2 | |
| 2008 | 6 | 8.7 | 11,973 | 71,835 | 6 | | | |
| 2007 | 5 | 7.2 | 405 | 2,025 | 1 | 2 | 1 | 1 |
| 2006 | 6 | 8.7 | 332 | 1,991 | 6 | | | |
| 2005 | 8 | 11.6 | 785 | 6,281 | 8 | | | |
| 2004 | 9 | 13.0 | 875 | 7,873 | 6 | 2 | 1 | |
| 2003 | 6 | 8.7 | 582 | 3,489 | 6 | | | |
| 2002 | 6 | 8.7 | 1,526 | 9,157 | 5 | 1 | | |
| 2001 | 4 | 5.8 | 599 | 2,396 | 3 | 1 | | |
| 2000 | 6 | 8.7 | 514 | 3,086 | 5 | | 1 | |
| 1999 | 4 | 5.8 | 495 | 1,981 | 3 | 1 | | |
| 1998 | 4 | 5.8 | 268 | 1,071 | 4 | | | |
| **Sum** | **69** | **100.0** | **1,736.7** | **119,831.0** | **56** | **7** | **5** | **1** |

*This table provides the frequency distribution of the M&A transactions in the sample. It includes all successfully completed transactions between 1998 and 2010 where at the time of the transaction, acquirer and target companies both had active operations in the brewing industry, the acquiring company has been publicly listed for at least 250 days prior to transaction announcement, the total transaction value accumulated to at least USD 50 mil. and the bidder through the transaction acquired a controlling stake in the target company. Additionally, total and average transaction values (in USD mil.) and details on acquirer region are provided.*

## RESEARCH METHODOLOGY

In order to determine and analyze short-term announcement effects our study applies event study methodology. Event studies have a long history that goes back to the 1930s (see MacKinley (1997)). Since then the methodology has become more and more sophisticated and found its application in empirical research on M&A. In particular, it has become a widely accepted tool to analyze the short-term value effects of M&A transactions. In our study, we assess short-term announcement returns using traditional event study methodology as for example described by Brown and Warner (1985) in connection with the "Fama-French-3-Factor-model" (FF3F). The use of the multi-factor FF3F model enables us to more accurately detect and determine abnormal performance than with a single factor market model as used by Brown and Warner (1985). Formula (1) shows how the abnormal returns were derived:

$$E(R_i) = R_f + b_i\left[E(R_m) - R_f\right] + s_i E(SMB) + h_i E(HML) \quad (1)$$

where $E(R_i)$ is the expected return on asset i, $R_f$ is the return on the risk-free asset, $E(R_m)$ is the expected return on the market portfolio, $E(SMB)$ is the expected return on the mimicking portfolio for the "small minus big" size factor and $E(HML)$ is the expected return on the mimicking portfolio for the "high minus low" book-to-market factor.

Fama and French (1992), in probably one of the most influential papers in the area of asset pricing in the past decade, argue that the single factor Capital Asset Pricing Model of Sharpe (1964) and Lintner (1965) has little ability to explain the cross-sectional variation in equity returns. They find that two other factors related to fundamental variables, namely size and the ratio of book equity to market equity, have strong roles in explaining variation in cross-sectional returns. In our study, the multi-factor FF3F model is used to determine abnormal returns of acquiring and rival companies by regressing a time series of the companies' excess returns (return less risk-free rate) with the time series of market excess returns, the time series of the difference in returns of small and big companies (SMB), and the time series of differences in returns of companies with high and low (HML) market-to-book values (formula 2).

$$R_{i,t} - R_{f,t} = \alpha_i + b_i\left(R_{M,t} - R_{f,t}\right) + s_i SMB_t + h_i HML_t + e_{i,t} \quad (2)$$

where $R_{i,t}$ is the realized return on asset i at time t, $R_{f,t}$ is the realized return on the risk-free asset at time t, $R_{M,t}$ is the realized return on the market portfolio at time t, $SMB_t$ is the realized return on the mimicking portfolio for the size factor at time t and $HML_t$ is the realized return on the mimicking portfolio for the book-to-market factor at time t.

The return of the market portfolio within the model usually refers to a market index that is associated with the particular security. In order to account for regional differences in industry returns and country-specific risk profiles our study determines local indices for each acquirer in the sample. For example, the DAX 30 index is used for German acquirer companies and the FTSE All Shares index is used for UK-based acquirer companies within the sample. Our study uses the 3-month US T-bill rate as a proxy for the risk free rate. The difference in returns of small and big companies as well as the difference in returns of companies with high and low market-to-book ratios is determined using global Frank Russell style portfolios as proposed by Faff (2003). The Russell style portfolios are utilized to create proxies for the Fama and French SMB and HML factors. Specifically, the style indices chosen are: (a) Global Russell large-cap Growth Index, (b) Global Russell large-cap Value Index, (c) Global Russell small-cap Growth Index, (d) Global Russell small-cap Value Index.

The Global Russell large-cap Growth Index (The Global Russell large-cap Value Index) measures the performance of the largest global companies with higher (lower) price-to-book ratios and higher (lower) forecasted growth values. Similarly, the Global Russell small-cap Growth Index (The Global Russell small-cap Value Index), measure the performance of global small-cap companies with higher (lower) price-to-book ratios and higher (lower) forecasted growth.

Having determined all relevant factors we finally estimate the acquirer return model by using a multivariate Ordinary Least Squares (OLS) regression over a 230 day estimation period starting at trading day t=-250 relative to the announcement date of the transaction. Finally, on the basis of these estimated FF3F Model parameters, we calculate the abnormal returns for all acquirer companies using different event windows. To test for statistical significance of acquirers' abnormal returns this study employs three test statistics. First, we apply a simple parametric t-test. Second, we use a cross-sectional test as proposed by Boehmer, Musumeci and Poulsen (1992). The cross-sectional test is commonly used in event study literature as it accounts for a potential event-induced increase in standard deviation. Third, since non-parametric test statistics can be more powerful than parametric t-statistics (see Serra (2002), Barber & Lyon (1996)), we apply the Wilcoxon Signed Rank test to provide for a thorough statistical review.

## EMPIRICAL RESULTS

In the following, the empirical results of our analyses are presented. We start off reporting the results for the total acquirer sample. In order determine potential drivers of abnormal performance we then report the results of the univarate and multivariate analyses. Finally, we specifically present announcement and rival effects among the "big four".

### Acquirer Announcement Effects

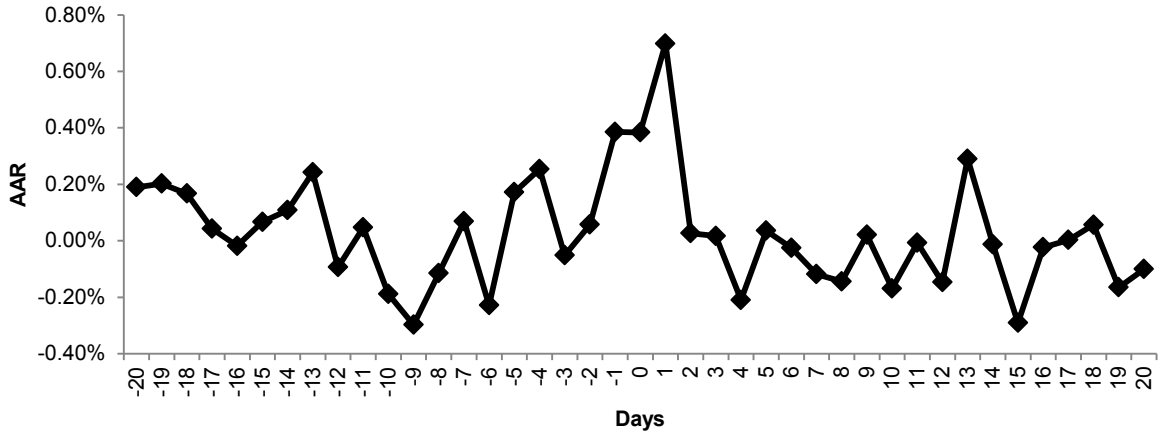
Table 2 reports the short-term announcement effects of M&A transactions on the total sample of acquirers in the brewing industry. The results show that acquirers earn a significant 1.77% in the [-5;5] and 1.47% in the [-1;1] event windows surrounding the announcement date. As Figure 1 shows, the abnormal returns peak following the day of the announcement of the M&A transaction. In case of the [-5;5] event window the results are significant at the 5%-level for the t-statistics as well as the cross-sectional test, and significant at the 10%- level for the Wilcoxon test statistics. In case of the [-1;1] event window the results are significant at the 1%-level for the t-statistics and significant at the 5%-level for the cross-sectional test. These findings are in line with the expected results and confirm the exceptional characteristics of the brewing industry. The short-term value effects show that capital markets in fact value the extraordinary synergy potentials in the brewing sector.

Table 2: Cumulative Average Abnormal Returns to Acquirers

| **Acquirers (N=69)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Event-Window** | **CAAR** | **t-Test** | | | **z-Test** | | | **WCX Test** | | |
| | | **t-value** | **p-value** | | **z-value** | **p-value** | | **z-value** | **p-value** | |
| [-20; 0] | 1.48% | 1.66 | 0.10 | * | 2.04 | 0.05 | ** | 1.38 | 0.17 | |
| [-10; 0] | 0.44% | 0.60 | 0.55 | | 0.67 | 0.51 | | 0.40 | 0.69 | |
| [-5; 0] | 1.20% | 1.96 | 0.05 | ** | 1.79 | 0.08 | * | 1.43 | 0.15 | |
| [-1; 0] | 0.77% | 1.52 | 0.13 | | 1.22 | 0.22 | | 0.53 | 0.60 | |
| [0] | 0.38% | 0.93 | 0.36 | | 0.70 | 0.49 | | 0.22 | 0.82 | |
| [0; +1] | 1.08% | 2.16 | 0.03 | ** | 1.84 | 0.07 | * | 1.41 | 0.16 | |
| [0; +5] | 0.95% | 1.56 | 0.12 | | 1.43 | 0.16 | | 1.30 | 0.19 | |
| [0; +10] | 0.52% | 0.70 | 0.49 | | 0.79 | 0.43 | | 0.83 | 0.41 | |
| [0; +20] | 0.12% | 0.12 | 0.90 | | 0.42 | 0.68 | | 0.11 | 0.91 | |
| [-1; +1] | 1.47% | 2.51 | 0.01 | *** | 2.23 | 0.03 | ** | 1.41 | 0.16 | |
| [-5; +5] | 1.77% | 2.37 | 0.02 | ** | 2.26 | 0.03 | ** | 1.81 | 0.07 | * |
| [-10; +10] | 0.57% | 0.57 | 0.57 | | 0.81 | 0.42 | | 0.17 | 0.86 | |
| [-20; +20] | 1.13% | 0.87 | 0.39 | | 1.47 | 0.15 | | 0.42 | 0.68 | |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies in mergers and acquisitions in the brewing industry. It contains all public acquirers whose trading data was available between 250 before and 20 days after transaction announcement. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using a standard t-test, the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

Figure 1: AARs of Acquirers Surrounding Announcement of the Transaction




*This figure provides daily abnormal average returns to acquiring companies of mergers and acquisitions in the brewing industry between 20 days before and 20 days after transaction announcement. It contains all public acquirers whose trading data was available between 250 before and 20 days after transaction announcement.*

The Robustness of Results with Respect to Deal, Acquirer and Target Characteristics

*Geographical Scope:* In order to analyze the impact of geographical diversification on acquirer returns we compare domestic transactions with cross-border transactions and emerging market transactions.

Table 3: Abnormal Returns to Acquirers Differentiated by Geographical Scope

| | Cross-Border | | Domestic | | Mean Comparison | |
|---|---|---|---|---|---|---|
| **N** | **49** | | **20** | | | |
| **EVENT WINDOW** | **CAAR** | **MEDIAN** | **CAAR** | **MEDIAN** | **ΔCAAR** | **ΔMEDIAN** |
| [-1; +1] | 1.02% * | 0.54% | 2.56% | -0.81% | -1.54% | 1.35% |
| [-5; +5] | 0.86% | 0.20% | 4.00% ** | 1.79% ** | -3.14% * | -1.59% |
| [-10; +10] | -0.70% | 0.11% | 3.69% * | 2.05% | -4.39% ** | -1.94% |
| [-20; +20] | -0.36% | -2.41% | 4.80% ** | 4.77% * | -5.16% * | -7.18% |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies involved in cross-border and domestic mergers and acquisitions in the brewing industry. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

Table 4: Abnormal Returns to Acquirers Differentiated by Target Region

| | Emerging Market | | Domestic | | Mean Comparison | |
|---|---|---|---|---|---|---|
| **N** | **27** | | **20** | | | |
| **EVENT WINDOW** | **CAAR** | **MEDIAN** | **CAAR** | **MEDIAN** | **ΔCAAR** | **ΔMEDIAN** |
| [-1; +1] | 1.05% | 0.46% | 2.56% | -0.81% | -1.51% | 1.27% |
| [-5; +5] | 1.20% * | 1.46% | 4.00% ** | 1.79% ** | -2.80% | -0.32% * |
| [-10; +10] | 1.94% ** | 2.57% | 3.69% * | 2.05% | -1.75% | 0.52% |
| [-20; +20] | 1.52% | 0.09% | 4.80% ** | 4.77% * | -3.27% | -4.68% * |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies involved in emerging market and domestic mergers and acquisitions in the brewing industry. Transactions are classified as emerging market transactions if the acquired target is based in Latin America, Asia (ex Japan) or Eastern Europe. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

Tables 3 and 4 present the findings about the impact of geographical diversification on short-term acquirer performance. Overall, acquirers in the brewing industry show a preference for cross-border transactions and in particular emerging market transactions. In our total sample of 69 transactions, only 29% (20 transactions) are domestic/national transactions, while 71% (49 transactions) are cross-border transactions. Approximately 55% (27 transactions) of the cross-border transactions qualify as emerging market transactions and involve targets that are based in Latin America, Asia (ex Japan) or Eastern Europe. On average domestic acquirers in almost every case show positive value effects upon the announcement of the transaction with CAARs and Medians of CARs ranging between 1.79% and 4.80%. Despite the small sample size of only 20 transactions, many of these returns are significant on the 5% and 10% level. On the other hand, acquirers in cross-border transactions show mixed effects with CAARs and Medians of CARs ranging between -2.41% and 1.02% across various event-windows. A comparison of means shows that CAARs for cross-border transactions are significantly lower for the [-5;5], [-10;10] and [-20;20] event windows. Despite the relatively small sample size, these results indicate that capital markets seem to favor domestic over cross-border transactions. While these results stand in contrast to our predictions, they are in line with studies by Datta and Puia (1995) and Eckbo and Thornburn (2000).

Nevertheless, the results will be challenged in the multivariate analysis due to the relative small amount of domestic transactions. Table 4 compares domestic transactions with emerging market transactions. On average acquirers gain in all event windows upon the announcement of emerging market transactions with value gains ranging between 0.09% and 2.57%. Despite the small sample size of 27 transactions, acquirer CAARs gains are significant on the 5% and 10% level for the [-10;10] and [-5;5] event windows respectively. These results stand in contrast to the findings of Williams and Liao (2008), who report negative abnormal returns to acquirers in emerging market transactions in the banking industry. Again, due to the limited amount of transactions, these results will be challenged in the multivariate analysis.

*Size of Transaction and Acquirer:* In order to test for the incremental effect of transaction size on acquirer returns the sample was divided into two subsamples containing the 30 largest transactions and 30 smallest transactions by deal volume. The results are summarized in Table 5. On average, acquirers in small transactions yield positive CAARs between 0.94% and 2.47% across all event windows. In case of the [-5;5] event window, acquirers yield a positive 1.52% which is significant at the 5% level. On the other hand, acquirers in large transactions experience mixed value effects across various event windows with insignificant CAARs ranging from -2.67% to 1.14%. A comparison of means shows a significant underperformance of acquirer returns in case of large transactions for the [-10;10] and [-20;20] event windows. While these results stand in contrast to the expected results, they clearly serve as an indication and will be tested in the multivariate regression model.

Table 5: Abnormal Returns to Acquirers Differentiated by Transaction Size

| N | Top 30<br>30 | | Bottom 30<br>30 | | Mean Comparison | |
|---|---|---|---|---|---|---|
| **Event Window** | **CAAR** | **MEDIAN** | **CAAR** | **MEDIAN** | **ΔCAAR** | **ΔMEDIAN** |
| [-1; +1] | 1.14% | 0.59% | 0.94% | -0.66% | 0.19% | 1.25% |
| [-5; +5] | 0.88% | -1.24% | 1.52% ** | 1.29% ** | -0.64% | -2.53% |
| [-10; +10] | -2.23% | -1.78% * | 1.33% | 0.94% | -3.56% * | -2.71% ** |
| [-20; +20] | -2.67% | -4.41% * | 2.47% * | 0.23% | -5.14% * | -4.64% *** |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies for the top 30 and bottom 30 transactions by transaction volume in the sample. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

In order to analyze the impact of acquirer size, the transactions in the sample were sorted by relative deal size (Transaction Volume/ Acquirer's Market Capitalization) and divided into two subsamples containing the 30 largest and 30 smallest transactions. Table 6 presents the findings. We find insignificant positive CAARs to acquirers in the case of relatively large targets ranging from 0.70% to 0.95%. In the case of small transactions from the acquirer's perspective, the CAARs show greater variance ranging from 0.61% to 3.33% and are significant at the 10% level for the [-1;1] and [-5;5] event windows. While the differences are not significant, the results provide an indication of higher CAARs for small acquirers or the acquisition of relatively large targets as suggested by Asquith et al. (1983), Moeller et al. (2003) and Jarrell and Poulsen (1989), they will be challenged in the multivariate analysis.

Table 6: Abnormal Returns to Acquirers Differentiated by Relative Transaction Size

| n | Top 30<br>30 | | Bottom 30<br>30 | | Mean Comparison | |
|---|---|---|---|---|---|---|
| **EVENT WINDOW** | **CAAR** | **MEDIAN** | **CAAR** | **MEDIAN** | **ΔCAAR** | **ΔMEDIAN** |
| [-1; +1] | 2.17% * | 0.30% * | 0.95% | 0.41% | 1.22% | -0.11% |
| [-5; +5] | 3.33% * | 2.05% | 0.70% | 0.61% | 2.63% | 1.43% ** |
| [-10; +10] | 0.61% | 0.18% | 0.73% | 1.17% | -0.12% | -0.98% |
| [-20; +20] | 1.41% | -3.50% | 0.80% | 0.23% | 0.61% | -3.73% |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies for the top 30 and bottom 30 transactions by relative transaction size in the sample. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

*Time Period:* In section 2 we argued that the change in market concentration and in particular the increased difficulty in finding suitable targets may have an impact on acquirer returns. Table 7 presents our findings comparing transactions between 1998 and 2003 and 2004 and 2010. While transactions announced between 1998 and 2003 yield insignificant positive and negative value effects, transactions between 2004 and 2010 on average yield positive value effects across all event windows. Moreover, with the exception of event window [-10;10] all of the CAARs reported are significant on the 5% or 10% level. A mean comparison, though not statistically significant, reveals higher returns to acquirers between 2004 and 2010 across all event windows. Despite the lack of statistical significance, these results serve as an indication and will be tested in the regression analysis.

Table 7: Abnormal Returns to Acquirers Differentiated by Transaction Date

| n | 1998-2003<br>30 | | 2004-2010<br>39 | | Mean Comparison | |
|---|---|---|---|---|---|---|
| **EVENT WINDOW** | **CAAR** | **MEDIAN** | **CAAR** | **MEDIAN** | **ΔCAAR** | **ΔMEDIAN** |
| [-1; +1] | 1.21% | -0.34% | 1.66% ** | 0.46% | -0.45% | -0.80% |
| [-5; +5] | 1.64% | 0.66% | 1.87% * | 1.19% * | -0.23% | -0.53% |
| [-10; +10] | -0.62% | -0.17% | 1.49% | 1.29% | -2.12% | -1.45% |
| [-20; +20] | -0.38% | -3.35% | 2.30% * | 0.09% | -2.68% | -3.44% |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies for mergers and acquisitions in the brewing industry between 1998-2003 and 2004-2010. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

*Public Status of Target:* Table 8 presents the results of acquirers' abnormal returns comparing transactions involving public and private targets. The acquisition of public targets yields mixed results with acquirers' CAARs ranging between -1.01% and 1.31% all of which are statistically insignificant. On

the other hand, acquirers of private targets experience positive value effects with significant CAARs ranging between 1.58% and 2.49%. Moreover, the CAAR of 2.49% for the [-5;5] event window is statistically significant on the 1% level. While the mean comparison shows that across all analyzed event-windows the acquisition of private targets leads to higher acquirer returns, the differences are not statistically significant. Nonetheless, these results are in line with studies by Moeller et al. (2003) and Faccio et al. (2006).

Table 8: Abnormal Returns to Acquirers Differentiated by Legal Status of Target

| | Public | | Private | | Mean Comparison | |
|---|---|---|---|---|---|---|
| n | 29 | | 40 | | | |
| EVENT WINDOW | CAAR | MEDIAN | CAAR | MEDIAN | ΔCAAR | ΔMEDIAN |
| [-1; +1] | 1.31% | 0.06% | 1.58% * | 0.45% | -0.28% | -0.39% |
| [-5; +5] | 0.77% | -1.56% | 2.49% *** | 1.61% * | -1.72% | -3.17% |
| [-10; +10] | -1.01% | 0.15% | 1.72% | 0.94% | -2.73% | -0.79% |
| [-20; +20] | 0.02% | -0.95% | 1.94% * | -0.65% | -1.92% | -0.30% |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies for mergers and acquisitions in the brewing industry for publicly-listed and private target companies. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

*Type of Consideration:* Table 9 compares the results of acquirer's abnormal returns of cash only transactions with transactions that use share-based or hybrid forms of consideration. Overall, brewers show a clear preference for cash only transactions. On average, acquirers paying solely with cash experience a positive CAAR of 1.37% for the [-1;1] event window, which is significant on the 5% level. The limited amount of share deals does not allow for a viable comparison and will hence be addressed in the multivariate analysis.

Table 9: Abnormal Returns to Acquirers Differentiated by Consideration Type

| | Cash Only | | Share Deals | | Mean Comparison | |
|---|---|---|---|---|---|---|
| n | 52 | | 11 | | | |
| EVENT WINDOW | CAAR | MEDIAN | CAAR | MEDIAN | ΔCAAR | ΔMEDIAN |
| [-1; +1] | 1.37% ** | 0.21% | 2.09% | 0.54% | -0.72% | -0.33% |
| [-5; +5] | 1.08% | 0.88% | 4.88% | 2.23% | -3.80% * | -1.35% |
| [-10; +10] | 0.32% | 0.47% | 2.31% | 2.56% | -1.99% | -2.09% |
| [-20; +20] | 1.03% | -0.83% | 3.71% | -0.95% | -2.68% | 0.12% |

*This table shows the cumulative average abnormal returns (CAAR) to acquiring companies for mergers and acquisitions in the brewing industry for cash-only and share-based transactions. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

*Transaction Experience:* Tables 10a and 10b present the results of acquirers' abnormal returns based on transaction experience. Overall, 13 of the total of 69 transactions involve acquirers that have only engaged in one transaction in the sample period (Single-Bidder) while 56 transactions involve acquirers that have engaged in at least one transaction in the sample period (Multi-Bidder). 36 transactions involve bidders that have engaged in more than five transactions in the sample period (Bidder-Champion). While we find no significant returns for Multi-Bidder transactions, we find a positive CAAR of 1.25% for Bidder-Champion transactions in the [-5;5] event window, which is significant at the 5% level. Due to the limited amount of Single-Bidder transactions, we shall provide a viable comparison in the regression analysis.

Table 10a: Abnormal Returns to Acquirers Differentiated by Transaction Experience

| n | Single-bidder 13 | | Multi-bidder 56 | | Mean Comparison | |
|---|---|---|---|---|---|---|
| **EVENT WINDOW** | **CAAR** | **MEDIAN** | **CAAR** | **MEDIAN** | **ΔCAAR** | **ΔMEDIAN** |
| [-1; +1] | 3.38% ** | 1.88% | 1.02% | 0.21% | 2.36% | 1.67% |
| [-5; +5] | 4.34% * | 2.27% | 1.17% | 0.88% | 3.17% * | 1.39% |
| [-10; +10] | 1.53% | -3.53% | 0.35% | 1.17% | 1.18% | -4.70% |
| [-20; +20] | 2.22% | -1.23% | 0.88% | -0.60% | 1.35% | -0.63% |

*This table shows the cumulative average abnormal returns (CAAR) acquiring companies for mergers and acquisitions in the brewing industry comparing single-bidders i.e. acquirers with only one announced transaction in the sample with multi-bidders i.e. acquirers with more than one announced transactions in the sample. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

Table 10b: Abnormal Returns to Acquirers Differentiated by Transaction Experience

| n | Single-bidder 13 | | Bidder Champions 36 | | Mean Comparison | |
|---|---|---|---|---|---|---|
| **EVENT WINDOW** | **CAAR** | **MEDIAN** | **CAAR** | **MEDIAN** | **ΔCAAR** | **ΔMEDIAN** |
| [-1; +1] | 3.38% ** | 1.88% | 1.25% ** | 0.50% | 2.14% | 1.38% |
| [-5; +5] | 4.34% * | 2.27% | 0.79% | 0.23% | 3.55% * | 2.04% |
| [-10; +10] | 1.53% | -3.53% | -0.81% | 0.04% | 2.34% | -3.57% |
| [-20; +20] | 2.22% | -1.23% | -1.63% | -3.89% | 3.86% | 2.66% |

*This table shows the cumulative average abnormal returns (CAAR) acquiring companies for mergers and acquisitions in the brewing industry comparing single-bidders i.e. acquirers with only one announced transaction in the sample with bidder-champions i.e. acquirers with more than five announced transactions in the sample. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

Multivariate Analysis

In order to provide a complete picture of the influential factors and to gain further insights into potential dependencies, a cross-sectional regression is performed on the cumulative abnormal returns to acquirers as presented in formula 3. In total, 11 variables are included in the regression model to represent the parameters, which have been individually analyzed in the univariate subsample analysis. In the following, the respective parameter values will be specified in detail.

$$CAR = \alpha_0 + \gamma_1 * Cross\ Border + \gamma_2 * Target\ LA + \gamma_3 * Target\ EE + \gamma_4 * Target\ Asia + \gamma_5 * Transaction\ Value + \gamma_6 * Rel.Transaction\ Value + \gamma_7 * Date\ A + \gamma_8 * Share\ Comp + \gamma_9 * Public\ Deal + \gamma_{10} * Multi\ Bidder + \gamma_{11} * Bidder\ Champion \quad (3)$$

*Geographical Scope:* The results presented in the univariate analysis provide a first indication that domestic transactions might have a positive impact on short-term acquirer performance when compared to cross-border transactions. At the same time, the results suggested a positive wealth effect if targets were based in emerging market economies (Latin America, Eastern Europe and Asia (ex Japan)). Both effects are included in the regression model using the dummy variables "Cross-Border", "Latin-America", "Eastern-Europe" and "Asia".

*Size of Transaction and Acquirer:* The results presented in the univariate subsample showed significant positive returns for the bottom 30 transactions by transaction value as well as the top 30 transactions by relative transaction value, indicating a preference for small transactions and small-sized acquirers. In

order to verify these results, transaction value and relative transaction value are included as variables in the regression model.

*Time Period:* As pointed out above the structures of the global beer market have materially changed in recent years. Consequently, we expected these changes to have an impact on acquirer performance. In the univariate subsample analysis we found significant positive returns for transactions between 2004 and 2010, we did not find any significant abnormal performance between 1998 and 2003. In order to test for a supposed relation, we include a dummy variable for time period 1998 – 2003.

*Public Status of Target:* The univariate results showed highly significant positive returns for the acquisition of private targets. On the other hand, no significant abnormal performance was found for public targets. We test these results by including a dummy variable for public targets in the regression model.

*Type of Consideration:* The results provided in the univariate analysis showed significant positive returns for cash transactions for the [-1;1] event windows surrounding the announcement date. On the other hand, transactions with share-based consideration showed even greater abnormal returns, albeit being statistically insignificant. In order to test for a supposed relation, we include a dummy variable considering share-based consideration.

*Transaction Experience:* The subsample analysis showed significant positive abnormal returns for bidder champions i.e. acquirers with at least five announced transactions in the sample. On the other hand, single bidders i.e. acquirers with only one announced transaction in the sample on average experienced even higher abnormal returns. In order to test for a potential relationship between transaction experience and acquirer return, we include two dummy variables reflecting Multi-Bidder and Bidder-Champion transactions.Table 12 presents the results of the complete regression models on the CAARs for the [-1;1], [-5;5] and [-10;10] event windows. The [-5;5] and [-10;10] models are significant on the 5% and 10% level respectively. Explanatory power is remarkably high with adjusted R-squared ranging between 12% and 14%. Autocorrelation issues can be ruled out due to high Durbin-Watson-Statistics in both cases. The overall abnormal short-term performance as represented by the constant yields a positive 4.7% for the [-1;1] and 6.4% for the [-5;5] event windows and are both highly significant at the 1% level.

Overall, these findings correspond to the positive announcement effects determined in the univariate analysis, clearly confirming our expectations.In addition, the regression models complement the univariate subsample analysis enabling the detection of a number of different value drivers of short-term performance. First of all, transaction value and acquirer size are determined to have a significant positive impact on short-term performance. These results stand in contrast to the findings of the univariate subsample analysis. The regression model confirms both target and acquirer size to be positively related to acquirer performance. With regard to target size, this relation can be confirmed for two of the regression models. On the other hand, the negative impact of relative deal size (positive impact of acquirer size) is confirmed across all three regression models. Overall, these findings provide clear evidence on the importance of size and its advantages in the brewing sector.

While not significant for all models, the multivariate analysis confirms the negative impact of cross-border transactions on acquirer returns. With regard to emerging market transactions, regression coefficients across all models are in most cases higher than those for all cross-border transactions. In the case of Latin America, the regression model for the [-1;1] event window even yields a positive regression coefficient of 3.7% which is significant at the 5% level. The subsample analysis on the impact of time on acquirer returns suggested an increase in abnormal acquirer returns over time. The multivariate regression does not show any significant impact of the announcement date on acquirer returns.

With regard to the public status of the target, the subsample analysis suggested acquirer returns to be positively impacted if the acquired target was not publically listed. The regression models confirm these results with negative coefficients across all three event windows. Moreover, a negative relation is determined for the [-5;5] event window which is significant at the 5% level.

Despite the small set of non-cash transactions, the subsample analysis suggested acquirer returns to be positively affected if the transaction includes share-based compensation. The regression models confirm these results with positive coefficients throughout all three models. Nonetheless, only one of the coefficients is significantly positive and hence we do not believe there is enough evidence to confirm a potential dependency. With regard to transaction experience, the univariate results suggested higher announcement returns to Single-Bidders when compared to Multi-Bidders. At the same time, we found significant positive returns to Bidder-Champions. The multivariate analysis does not provide any additional insight as to a potential dependency between acquirer return and transaction experience. Given the lack of additional evidence, we cannot confirm an impact of transaction experience on acquirer performance.

Table 11: Multivariate Regression Analysis

| | [-1; +1] | | [-5; +5] | | [-10; +10] | |
|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **t-value** | **Coefficient** | **t-value** | **Coefficient** | **t-value** |
| (Constant) | 0.047 *** | 2.740 | 0.064 *** | 2.994 | 0.047 | 1.623 |
| Cross_Border | -0.014 | -0.744 | -0.021 | -0.955 | -0.050 * | -1.657 |
| Targ_LA | 0.037 ** | 1.982 | 0.025 | 1.104 | 0.044 | 1.408 |
| Targ_EE | -0.019 | -1.036 | -0.008 | -0.378 | -0.014 | -0.482 |
| Targ_Asia | -0.005 | -0.259 | -0.010 | -0.432 | 0.033 | 1.037 |
| Transaction_Value | 0.000 * | 1.915 | 0.000 ** | 2.074 | 0.000 | 0.829 |
| Rel_Value | -0.018 * | -1.660 | -0.029 ** | -2.153 | -0.040 ** | -2.174 |
| Date_A | 0.002 | 0.127 | -0.003 | -0.178 | -0.012 | -0.602 |
| Share_Cash | 0.015 | 0.873 | 0.059 *** | 2.863 | 0.044 | 1.609 |
| Public_Target | -0.016 | -1.147 | -0.036 ** | -2.167 | -0.036 | -1.603 |
| Multi_Bidder | -0.029 | -1.592 | -0.022 | -0.985 | 0.021 | 0.697 |
| Bidder_Champion | 0.009 | 0.550 | -0.006 | -0.278 | -0.015 | -0.529 |
| R-squared | 0.221 | | 0.278 | | 0.267 | |
| Adjusted R-squared | 0.071 | | 0.139 | | 0.126 | |
| Durbin-Watson | 1.990 | | 2.379 | | 2.530 | |
| F-statistic | 1.469 | | 1.997 ** | | 1.890 * | |
| p (F-stat) | 0.169 | | 0.046 | | 0.060 | |

*CAARs were derived for a sample of 69 transactions in the brewing industry between 1998 and 2010. For a detailed description of the variables and the underlying equation, see section 4.1. The Durbin-Watson statistics were estimated to test for autocorrelation of the residuals. Proximity of the value to "2" is regarded as an indication of no autocorrelation between residuals. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively.*

Announcement and Rival Effects among the "Big Four"

While the analyses presented above covered all publicly listed acquirers, in the following we give particular attention to announcement effects of the "big four" and rival effects among them. Table 12 presents the short-term announcement effects of the "big four". Overall, we find positive announcement returns of 1.25% for the [-1;1] event window. For the t and z statistics, these results are significant on the 5% level. For the non-parametric Wilcoxon test, we do not find any significant return, though it should be noted that the p-value of 0.11 is very close to the threshold for significance at the 10% level. These results are in line with our predictions and support the argument that capital markets positively value the announcement of a M&A transaction in a strongly consolidated market, where suitable targets are becoming increasingly hard to find. However, a closer look at the other event windows suggests that the

positive CAARs decrease the bigger the event window is defined eventually turning negative for the [-10;10] and [-20;20] event windows. While these results are not statistically significant, they suggest an interesting trend. Nonetheless, given the significant positive returns for the [-1;1] event window we conclude that the "big four" experience positive short-term value effects following the announcement of a transaction.

Table 12: Cumulative Average Abnormal Returns to the "Big Four"

| **Acquirers (N=36)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Event-Window** | **CAAR** | **t-Test** | | | **z-Test** | | | **WCX Test** | |
| | | **t-value** | **p-value** | | **z-value** | **p-value** | | **z-value** | **p-value** |
| [-1; +1] | 1.25% | 2.04 | 0.04 | ** | 1.99 | 0.05 | ** | -1.59 | 0.11 |
| [-5; +5] | 0.79% | 0.96 | 0.34 | | 1.12 | 0.27 | | -0.77 | 0.44 |
| [-10; +10] | -0.81% | -0.72 | 0.48 | | -0.55 | 0.58 | | -0.55 | 0.58 |
| [-20; +20] | -1.63% | -1.05 | 0.30 | | -0.85 | 0.40 | | -1.54 | 0.12 |

*This table shows the cumulative average abnormal returns (CAAR) to the "big four" following the announcement of mergers and acquisitions in the brewing industry. It contains all transactions by the "big four" for which trading data was available between 250 before and 20 days after transaction announcement. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using a standard t-test, the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

Table 13 presents the rival returns to the "big four" i.e. the returns to the remaining 3 companies if one of the "big four" announces a transaction (e.g. the returns to Heineken, Carlsberg and SABMiller if Anheuser Busch Inbev announces a transaction). Using this approach we analyze 98 rival events for our sample. While we recognize a similar pattern of decreasing abnormal returns in case of larger event windows, we only find significantly negative returns for the [-10;10] event window. The returns are significant at the 10% level using a standard t-statistic and the non-parametric Wilcoxon signed rank test. The findings suggest that the negative competitive effects of missing out on a potential M&A opportunity or strengthened competition from a newly combined firm, outweigh potential positive signaling effects. These results stand in contrast to existing literature (see e.g. Eckbo (1985), Song and Walking (2000), Clougherty and Duso (2009)) and confirm the exceptional characteristics of the brewing sector.

Table 13: Cumulative Average Abnormal Returns to Rivals of the "Big Four"

| **Rivals (N=98)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Event-Window** | **CAAR** | **t-Test** | | | **z-Test** | | | **WCX Test** | |
| | | **t-value** | **p-value** | | **z-value** | **p-value** | | **z-value** | **p-value** |
| [-1; +1] | 0.33% | 1.02 | 0.31 | | 1.09 | 0.28 | | -0.86 | 0.39 |
| [-5; +5] | 0.25% | 0.52 | 0.60 | | 1.04 | 0.30 | | -0.26 | 0.79 |
| [-10; +10] | -1.32% | -1.92 | 0.06 | * | -1.26 | 0.21 | | -1.69 | 0.09 * |
| [-20; +20] | -1.53% | -1.49 | 0.14 | | -0.64 | 0.52 | | -0.91 | 0.36 |

*This table shows the cumulative average abnormal returns (CAAR) to the "big four" following the announcement of mergers and acquisitions by a rival. It contains all events for which trading data was available between 250 before and 20 days after transaction announcement. Statistical significance at the 10%, 5% and 1% level is denoted by *, ** and *** respectively. The statistical significance has been tested using a standard t-test, the cross-sectional test as proposed by Boehmer et al. (1992) (z-Test) and the Wilcoxon Signed Rank Test as described by Barber and Lyon (1996).*

Overall, our findings seem very consistent with previous industry research (see e.g. Kerkvliet et al. (1998), Earlam et al. (2010), Schwankl (2008)) and confirm the importance of scale and synergies in the brewing sector. In a consolidated market, where it is becoming increasingly hard to find suitable M&A targets, capital markets seem to value the successful quest for a consolidation opportunity, while punishing rivals that miss out. Even though our study focuses solely on the brewing industry, the

documented results may be indicative for other industries as well. In particular, industries with other consumer products and similar oligopolistic market structures (e.g. tobacco and breakfast cereals) may yield similar results.

## CONCLUSION

The objective of this study was to analyze M&A announcement effects of acquirers and rivals in the brewing industry. For this purpose, a sample of 69 horizontal M&A transactions involving brewing companies between 1998 and 2010 was identified and examined using a combination of two approaches: the traditional event study methodology and the Fama-French-3-Factor model. Our results provide new insights into the perceived short-term success of M&A transactions in the brewing industry and its corresponding evaluation through capital markets.

Firstly, our results indicate that acquirers in the brewing industry experience significant positive short-term value effects following the announcement of an M&A transaction. This positive finding is an outstanding attribute of the sector and stands in contrast to cross-industry studies by Andrade et al. (2001), Bruner (2002) and Loughran and Vijh (1997) and older industry specific research by Ebneth and Theuvsen (2007) all of which provide evidence of significant negative abnormal returns or at most insignificant positive returns. Therefore, it appears that capital markets specifically in recent years value the above-average synergy potential of the sector.

Secondly, our results provide evidence for a number of value drivers of abnormal acquirer performance. Consistent with the findings of Datta and Puia (1995) we find a positive relation between domestic transactions and short-term acquirer performance. However, at the same time and in contrast to the findings of Williams and Liao (2008), we also find a positive impact of cross-border transactions involving targets in emerging markets, in particular Latin America, suggesting that capital markets value the international diversification strategies deployed by brewers. Moreover, in contrast to findings of Asquith et al. (1983), Jarrell and Poulsen (1989) and Moeller et al. (2003) we report a positive impact of acquirer size and transaction value, emphasizing the size advantages in the sector. On the other hand, our results provide evidence with regard to a negative relationship between acquirer returns and the target's public status. These results are consistent with Moeller et al. (2003) and Faccio et al. (2006), suggesting that brewers may have to pay significant premiums for targets that are publicly listed.

Thirdly, our results indicate that the "big four" experience significant positive value effects upon announcing an M&A transaction suggesting that capital markets value the successful search for a suitable target in a strongly concentrated market. Close rivals, missing out on an M&A opportunity suffer from significant short-term value losses.While our study addresses a number of important questions with regard to capital market effects of M&A in the brewing industry and the impact of determinant variables, the presented results also leave open questions and give rise to new research issues. As our study is limited to short-term capital market effects, the question arises whether acquiring brewers are able to sustain the positive announcement effects. Thus, future research could investigate the long-term implications of M&A in the sector. In addition to investigating capital market implications, future research could also analyze the impact of M&A on the operating performance of the involved companies. Given the expected continuation of the consolidation process, we believe that M&A in the brewing industry provide an interesting avenue for future research.

Furthermore, the results underline the importance of industry-specific M&A analyses, as sector related potentials to generate value differ among industries, resulting in possibly biased finding of cross-industry examinations.

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