"Long-run M&A success of strategic bidders in the construction industry"

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SECTION 2. Management in firms and organizations

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Long-run M&A success of strategic bidders in the construction industry

Abstract

The M&A success of strategic consolidation in various industries can be at least partly explained by increased market power, some potential for collusion or monopolistic price setting capabilities. This is not the case with the construction industry. This industry is characterized by high fragmentation, very low market shares of even the largest corporations and hardly any potential for gaining market power through acquisitions. Nevertheless, the construction industry shows intensive M&A activity and the question arises whether these transactions are favorable for the bidding companies.

The results document remarkably positive long-run stock price performances for acquirers within the construction industry. These results do not only account for strategic bidders, but also for the construction industry diversifying lateral acquisitions. This success is mainly driven by the transaction characteristics of the profitability, capital structure, payment media and the kind of takeover.

Keywords: construction industry, strategic mergers and acquisitions, long-term bidder gains, success parameters.
JEL Classification: F21, F23, G14, G34, L74.

Introduction

Value generation in M&A transactions is an intensively examined area of research with a significant number of published studies. Most of short-run event studies report either significant negative or sometimes insignificant abnormal returns for the acquirers around the takeover announcements (Andrade, Mitchell and Stafford, 2001; Bruner, 2002; Campa and Hernando, 2006; Swanstrom, 2006; Vogt, 2011). Subsequent to these short-term studies, some research extends the observation period to a long-run horizon. Although Loughran and Vijh (1997) document positive wealth effects for cash bidders on a five year horizon, they show on average a negative long-term performance for all bidders. Likewise Agrawal and Samwick (1992) as well as Rau and Vermaelen (1998) illustrate negative wealth effects for acquirers over longer periods.

These general findings do not distinguish between the stock returns for each industry, but instead report results for cross-industry observations. This sampling neglects potential industry specific wealth effects. Additionally, the heterogeneous abnormal returns of the various industries often cause inconsistent results for the bidders (Stulz, Walkling and Song, 1990; Goergen and Renneborg, 2004; Gregory and McCorriston, 2005). Industries with specific production processes, like the construction industry, might show a distinct return picture. The construction industry differs significantly in its operations and characteristics from other industries (McGraw-Hill Construction, 2007). Contrary to cross-industry studies these peculiarities imply in general a positive impact of M&A activities on the bidders' wealth.

The size of a construction firm often determines the success at tendering for a new project. Construction projects principals recognize the firm size affects the ability of the construction firm to realize large construction projects (Delaney and Wamuziri, 2004). Particularly in large scale projects, which are especially common in the civil engineering sector, size and financial strength, define an essential prerequisite for conducting such projects successfully. Construction firms must incur costly capital expenditures to utilize complex customized and high-tech machines such as huge drillers for tunnel construction (Gonzales, Arruñada and Fernández, 1998). Hence, M&A might help the company receive the required size, knowledge and capabilities to accomplish prestigious and often lucrative large scale projects.

Contrary to most manufacturing firms, construction companies do not produce homogeneous mass, but unique customized products. Each new product will need new designs, plans, structures, operations and calculations (Welling and Kamann, 2001). This increases the risk of unforeseen events as for example unpredicted soil conditions on the construction site which might negatively affect the project's financial result (Miozzo, 2002). Especially the supervision of heterogeneous and constantly changing teams with different educational backgrounds may cause crucial problems to the success of the project (Kamann et al., 2006). Therefore, financial strength and sufficient corporate size is required to bear the risk of a financial failure of a project. According to Amihud, Dodd and Weinstein (1986) takeovers contribute to these requirements and reduce the risk of financial instability or even a firm collapse.

In addition to these specifics, the construction market is highly fragmented and construction firms face strong price competition when bidding for new projects. It is common practice that the project principal, especially public authorities, often choose the contractor with the lowest offered price for the project (Ball, 1996). However, subcontractors often deliver lower than requested quality when they are in a short-term contract with a general contractor (Haksever, Demir and Giran, 2001). In the worst case a subcontractor fails during the project. Such incidents can entail delays in the construction process and thus cause penalty payments for the general contractor. Due to these drawbacks, conventional subcontractor selection often leads to higher than expected costs of a construction project (Egan, 1998). At the same time, a rising number of clients demand more stringent quality assurance from construction firms (Barlow and Jashapara, 1998). Clients increasingly request a better structured and organized supply chain from construction companies, in order to receive a higher reliability and quality of the construction services (Briscoe and Geoffrey, 2001).

Within the construction industry, "partnering" refers to project and strategic partnerships. Project partnering is often used by general contractors to bid on a team for a project and to share the operational as well as financial risk of large scale projects (Black, Akintoye and Fitzgerald, 2000). In addition, project partnering provides the opportunity to test a partnership before extending it to a strategic one (Li et al., 2001). Strategic partnerships are usually long-term relationships and play an important role in the construction industry particularly because of the high-valued experience transfer between the projects (Beach, Webster and Campbell, 2005). Although partnerships, in particular the strategic type, allow a close cooperation to exist between construction firms, a partnership is still a loose network. Construction firms face the threat that an essential partner might drop out of the partnership and take all the obtained knowledge with it. This risk and the general distrust that partners might abuse partnerships to cause damage to the counterpart often restrain construction firms from seeking long-term partnerships (Bresnen and Marshall, 2000). Some construction firms enlarge their value chain to downstream related businesses like real estate operations or facility management in order to distribute their revenue streams. These revenue streams create more stable income sources than the volatile project business. Others seek a strategic corporate advantage by purchasing companies from other business sectors.

Several non-construction firms (excluding financial institutions) also intend to profit from the described long-term benefits in the construction industry by purchasing a construction firm. Hence, the vertical extension of up- or downstream related companies towards the actual construction business is a common acquisition strategy. Firms not directly related to the construction industry acquire construction firms in order to decrease their dependence on purchasing construction services for future projects in the market. Finally, some project principals purchase construction firms as they fear bankruptcy and failure of the construction firm or at least costly interruptions. In this case the M&A transactions are supposed to guarantee the continuation of the project (Thomson Financial, 2008).

Several short-term event studies about the wealth effects for bidders at M&A announcements support this thesis. For instance, the studies on domestic takeovers within the construction industry by Choi and Russel (2004) and Delaney and Wamuziri (2004), which also include the construction material industry, indicate positive abnormal returns for the bidding companies. Pauser, Rottke and Schiereck (2007) investigate takeovers within the construction industry on a global scale. They report on average positive abnormal returns for the target and the combined entity and slightly positive results for the acquirer. And Vogt, Kurzrock, Rottke and Schiereck (2012) document positive abnormal returns for the bidders at takeovers within the construction industry regardless if the acquisition was on domestic or international targets.

Hence, in this paper we illustrate the wealth effects of M&A for bidders in the long-run by examining a long-term capital market study. Since we concentrate on a global scale, we also distinguish between the wealth effects of national vs. international takeovers. Larger parts of the analysis are also documented in Vogt (2011).

This paper is organized as follows. The subject is set in section 1 and section 2 introduces the applied data set and methodology. The long-term capital market reactions about M&A in the construction industry will be highlighted in section 3. A detailed BHAR regression analysis illustrates the potential success factors of the investigated takeovers in section 4. The last section concludes the study by summarizing the main findings and implications of this research work.

1. Data and methodology

1.1. Data. We select the M&A events with participation of construction firms from Thomson One SDC Platinum Database. As we concentrate on the long-term bidder returns of construction firms engaging in a takeover or a non-construction company purchasing a construction firm, we choose all M&A deals that reference construction firms

either as a bidder or a target. For the classification of the construction and non-construction firms we applied the standard industrial code scheme (SIC). The construction industry SIC codes comprise the digits 1500-1799.

We include all deals from 1982 to 2004. The minimum value of the transaction has to amount to 20 mn USD. Besides, the acquirer must intend to own at least 50% + 1 share of the entire equity thereby gaining control over the target. The acquiring company must be listed on a public stock exchange during the time and up to three years observation period after the M&A announcement. The target can either be a public or private company. By applying

these criteria we obtain 354 takeovers. In 243 cases, the bidder belongs to the construction industry. In 111 cases, the bidder is a non-construction company. In Table 1 we depict in detail the takeovers initiated by construction companies regarding their year of occurrence, the strategic focus, the internationality and the transaction volume per year.

In Table 2 we add the 111 bidders from outside of the construction industry. In the year 1991, the average transaction volume stands out due to the small amount of takeovers in this year and the nearly 3 bn USD acquisition of the American residential constructor Beazer PLC by the English construction conglomerate Hanson PLC (Austin, 1992).

Table 1. Sample overview with construction firms as bidders

Year	N	Horizontal	Vertical	Conglomerate	Domestic	Cross border	Total transaction volume (mn. USD)	Average transaction volume (mn. USD)
2004	13	4	7	2	13	0	1180.49	90.81
2003	24	16	6	2	17	7	6043.10	251.80
2002	36	25	8	3	30	6	6209.15	172.48
2001	29	18	6	5	23	6	7600.31	262.08
2000	42	23	8	11	27	15	8319.62	198.09
1999	27	11	7	9	16	11	10475.37	387.98
1998	27	15	10	2	25	2	3832.04	141.93
1997	9	7	1	1	7	2	1536.51	170.72
1996	12	4	7	1	9	3	1089.87	90.82
1995	8	7	0	1	5	3	604.07	75.51
1994	5	2	3	0	5	0	346.98	69.40
1993	1	1	0	0	1	0	34.52	34.52
1992	3	3	0	0	3	0	128.99	43.00
1991	1	0	0	1	1	0	32.77	32.77
1990	2	1	1	0	2	0	52.67	26.34
1989	2	0	1	1	2	0	201.86	100.93
1988	1	0	1	0	1	0	31.94	31.94
1987	1	0	1	0	1	0	52.10	52.10
1986	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
Σ	243	137	67	39	188	55	47772.35	2233.19

Table 2. Sample overview with non-construction firms as bidders

Year	N	Vertical	Conglomerate	Financial investment	Financial difficulties	Domestic	Cross border	Total transaction volume (mn. USD)	Average transaction volume (mn. USD)
2004	4	3	0	1	0	3	1	333.71	83.43
2003	9	6	0	3	0	7	2	2150.50	238.94
2002	14	9	3	2	0	8	6	1883.32	134.52
2001	13	8	5	0	0	7	6	809.78	62.29
2000	15	7	4	2	2	8	7	3200.69	213.38
1999	13	8	2	2	1	11	2	1578.42	121.42
1998	10	9	0	1	0	7	3	748.02	74.80
1997	3	2	1	0	0	3	0	2798.60	932.87
1996	9	5	1	1	3	5	4	2220.34	246.70
1995	5	4	0	1	0	3	2	592.36	118.47
1994	5	4	0	0	0	2	3	236.06	47.21
1993	0	0	0	0	0	0	0	0.00	0.00

Table 2 (cont.). Sample overview with non-construction firms as bidders

Year	N	Vertical	Conglomerate	Financial investment	Financial difficulties	Domestic	Cross border	Total transaction volume (mn. USD)	Average transaction volume (mn. USD)
1992	0	0	0	0	0	0	0	0.00	0.00
1991	2	2	0	0	0	2	0	3287.97	1643.98
1990	4	2	0	0	2	4	0	2135.33	533.83
1989	2	1	0	1	0	1	1	1318.40	659.20
1988	1	1	0	0	0	0	1	49.63	49.63
1987	1	0	0	1	0	1	0	30.12	30.12
1986	0	0	0	0	0	0	0	0.00	0.00
1985	1	0	1	0	0	0	1	445.00	445.00
Σ	111	71	17	15	8	72	39	23818.22	5635.80

Both tables show a steady increase of takeover activities within the construction industry. Almost all strategic foci at both groups undergo remarkable growth rates. The same accounts for domestic and international takeovers. Even though there is a trend to operate more internationally, domestic takeovers still account for the majority of the acquisitions within the construction industry.

1.2. Methodology. In contrast to short-term analyses, long-term performance investigation faces several difficulties which can severely bias the calculated results (Barber and Lyon, 1997; Kothari and Warner, 1997). Long-run abnormal returns are often positively skewed and require particular testing procedures. Knowing about these biases we adjust our selected benchmark portfolios and apply adequate test statistics in order to avoid any result distortion. Table 1A in the Appendix provides information on skewness and kurtosis within various subsamples.

We apply the BHAR approach where the stock returns of the firms experiencing a corporate event as a M&A announcement are compared to the stock performance of firms without such an event, but which display similar corporate characteristics as the sample firms. Common characteristics for selecting representative benchmark firms are the size and the market-to-book value (Barber and Lyon, 1997). If a firm has a market capitalization or a market-to-book value in the range of 70%-130% of the examined firm, it can be accounted as a representative match and used for the reference portfolio for the respecting sample firm (Lyon, Barber and Tsai, 1999). We also build reference portfolios by combining the market capitalization and the market-to-book value criteria.

Since we examine M&A events only within the construction industry, we have to determine our matching firms. Hence, we select construction firms exclusively for the reference portfolios when analyzing the BHAR of construction firms. Likewise we compare each non-construction bidder only with reference portfolios from their respecting industry. A

list with all companies which were selected as matching firms is available on request by the authors. After detecting a reference portfolio for each bidder we calculate the BHAR for each firm i for T months with the following formula:

$$BHAR_{i,T} = \prod_{t=1}^{T}(1 + BHR_{i,t}) - \prod_{t=1}^{T}(1 + BHR_{j,t}).$$

$BHR_{i,t}$ refers to the buy-and-hold return of firm i over the time interval t. $BHR_{j,t}$ refers to the buy-and-hold return of the reference portfolio over the time interval t. After determining the BHAR for each firm, we aggregate the firm BHARs for all subgroups we concentrate on in our study. The investigated period comprises one, two and three years. According to Mitchell and Stafford (2000) longer time horizons than three years usually do not produce more reliable results for the determination of the long-term effects of M&A events.

For the robustness evaluation of the achieved results we apply several test statistics. At first we test whether the mean of the BHAR is different from zero with the conventional t-test. However, BHAR distributions often suffer from the aforementioned positive skewness. Therefore, we also apply skewness-adjusted t-statistics to the procedure of Lyon, Barber and Tsai (1999). In addition, we bootstrap the test statistic. As Sutton (1993) and Lyon, Barber and Tsai (1999) suggest, bootstrapping procedures deliver exact results for the skewness adjusted test statistic. At the applied bootstrapping procedure 1,000 bootstrapped resamples are withdrawn randomly from the original sample of size $n_b = n/2$ and for each resample the skewness adjusted t-statistic is calculated[1]. With the Wilcoxon signed rank sum test, the robustness of the results is tested under the assumption of a non-parametric distribution.

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[1] Resamples with a size of $n/2$ yield more reliable test statistics with respect to the skewness adjustment than resample of size n (Bickel, Gotze and van Zwet, 1997; Shao, 1996).

2. Empirical results

2.1. Overall sample analysis. Table 1A (see Appendix) depicts the one year, two years and three years BHAR for the overall construction and non-construction bidder samples yielded in comparison to the reference samples consisting of market value (MV), market-to-book-value (MTBV) and combined (CB) portfolios.

Nearly all results show positive wealth effects for bidders within three years after a takeover event. While the average BHAR for construction firms in comparison to the MV reference sample is still low with 3-4%, they outperform the MTBV by around 13% and the CB reference portfolio even by 22-23%. All results show a high significance regardless of the test statistics, in particular the abnormal returns to MTBV and CB reference portfolios. Although in general construction firms benefit from takeover activities, it seems as if there are some firms yielding remarkably high abnormal returns. This again coincides with the expectation of skewed results in long-term event studies.

A similar picture appears for the wealth effects of the non-construction sample. The average abnormal returns are strongly positive and highly significant with BHAR values between 14-16% at MV, 24-26% at the MTBV and 20-22% at the CB reference sample approach. Contrary, the median values of the non-construction firms after a M&A event exceed the performance of the reference samples only marginally and do not depict the same consistency in their significance as the average results do. The very low median of 0.09% and 0.22% at the MTBV reference samples even do not show any significance for their respective two and three years observation period. Considering the difference test, only the BHAR of the MTBV groups of the construction and non-construction firms show significant differences to each other.

Despite these variations among the average BHAR and the low, but positive median values, M&A activities within the construction industry are overall worthwhile regardless whether the bidder is a construction firm or an industry outside investor. These results correspond to assumptions from the partnering literature, which suggests it is beneficial for construction firms to engage in close cooperation with other construction firms and/or subcontractors.

2.2. Strategic focus of takeovers. Though the results of the overall samples provide a first impression about the general long-term wealth effects for bidders in the construction industry, with the subsequent analysis we strive to illuminate the wealth effects for the various strategic foci of these takeovers (Tables 2A, 3A, see Appendix).

Likewise to the overall sample analysis, the mean values to the MTBV and combined portfolios display the strongest and most significant results for long-term effects at horizontal and vertical acquisitions. At horizontal acquisitions the abnormal returns amount to around 25% (CB portfolio) and 12-13% (MTBV portfolio). All results are significant at the 1%-level regardless of the test procedure. The abnormal returns to the MV-portfolio also show clear positive but smaller and nearly exclusively insignificant results (4-5%). The abnormal returns at vertical transactions for the same portfolio group depict small (ca. 3%) and insignificant results as well. In comparison to the other two groups, vertical transactions yields indicate clear significant wealth effects for the shareholder (14% to MTBV and 18% to CB portfolio). If the median abnormal returns are considered, construction firms seem to benefit by far less from horizontal and vertical acquisitions in the long run. On horizontal acquisitions construction firms only gain ca. 1% BHAR and on vertical transactions this amount shrinks even below 1% (0.26-0.76% to MTBV and 0.46-0.89% to CB portfolios). Nevertheless, considering the percentage rate of takeovers with positive BHAR of up to 68.35% at horizontal and 72.97% at vertical acquisitions, both strategic acquisitions directions entail positive wealth impacts for the bidding firms.

Conglomerate transactions draw a more inconsistent picture. While the abnormal returns from the CB-portfolio and MTBV approach nearly correspond to the high gains of horizontal takeovers with about 21% and 10% respectively, the results from the MV approach as well as all median values lie either slightly above or below zero. The same accounts for the rate of transactions with positive BHAR which oscillate among 38% and 56%. Hence, the determination of the value effects from conglomerate takeovers remains vague, particularly as most results are insignificant.

Overall, the results indicate positive long-term wealth impacts for construction firms strengthening their market power by horizontal takeovers and extending their business value chain and thus their cash inflow sources by vertical integration. The bigger size after a takeover diminishes the risk of failure and enables the construction firms to bid on large-sized and usually lucrative projects (Delaney and Wamuziri, 2004). All these positive effects fit to the described positive effects from partnerships. Hence, the results support the assumption that construction firms not only benefit from cooperating with other construction firms or up- and downstream related businesses, but also from integrating competitors, subcontractors or facility operators.

2.3. Detailed analysis of takeovers of non-construction companies. There are several subcontractors and construction material or components producers extending their business into the construction business by purchasing a construction firm. Several facility operators purchase construction firms to improve their quality standards of their offered services. Some firms without the focus on any construction related business, but in the frequent need of construction services, sometimes would rather integrate construction services within their company than buy the services regularly over the market.

On the other hand, several financial institutions assume potential profitability opportunities within some construction firms. Therefore, they either use these financial investments in order to actively raise the efficiency and profitability of the construction firm or simply to diversify and enhance the investment portfolio. Finally, some takeovers within the construction industry only occur due to financial difficulties of construction firms and the accompanying risk of credit defaults or project abandonment. Tables 4A and 5A (see Appendix) display the yielded BHAR of these four groups.

Companies unrelated to the construction sector earn on average significant positive abnormal returns from acquisition of construction firms. The MV or MTBV portfolio bidders accomplish nearly 30% over the three observation periods. If compared to the CB portfolio, the BHAR even raise to about 57%. Similar to the observations for construction firms, the median values are below the mean values. All medians show at least positive values and the medians of the CB-portfolio approach amount to 13-17%. Nevertheless, most results are insignificant except the significant BHAR of the CB and thus provide only a tendency for conglomerate acquisition by non-construction firms.

The results for bidders integrating construction firms vertically show highly significant BHAR. The MV portfolio BHAR amounts to around 15%. To the other two samples bidders yield 24%. All results are at least significant on the 5% level for all three significance tests. The median values show slightly positive as well as negative wealth effects for the bidding companies. However, the BHAR tend to become positive over the time of observation. Two median values are negative in the one year observation period after the event, but on the three year observation all medians are positive. In addition, only the positive median values are significant. Furthermore, the percentage rate of transactions with positive BHAR (up to almost 69% of the transactions are positive) support the wealth creating impact of vertical integration of construc-

tion firms. In total, vertical integration within the construction industry seems to cause positive wealth effects regardless if the construction firm is the bidder or the target of the transaction (see also section 2.2 for results).

Financial institutions in particular REITS with their engagements in the construction industry outperform all other types of acquisitions when considering the consistency of the accomplished BHAR. The MV approach yields about 25%, the MTBV approach 37-38% and the CB approach ca. 51%. The rate of positives is except for the MTBV approach on the one year observation period above 50%. In 44% of the examined cases, all institutions yield positive BHAR. In spite of the small sample size, the results for the latter two groups even show significance on the 10% level for the mean values. These results suggest a professional investment selection at the observed financial institutions as well as a strong capability to restructure construction firms efficiently, thereby realizing high profits in the long run.

The transactions exercised due to financial difficulties of the construction firm show low but positive BHAR (1.74% MV-, 2.67% CB- and 3.12% MTBV-approach) for the one year observation period with significance on the 5% level. These results are surprising at first, as firms with financial problems are supposed to cause financial burdens for the acquiring company rather than yield financial benefits. Most probably the capital market assesses the acquisition of the construction firm with financial problems less burdensome than the expected credit defaults or the losses from the abandonment of a project. Therefore all savings interventions are positively rewarded in the first year after the event. However, when extending the observation period, the BHAR decline and become finally negative.

2.4. Domestic and international takeovers. Several construction firms distribute their business activities to various countries in order to reduce its economic dependency from one market and to scatter their revenues streams. Foreign acquisitions permit companies to raise their international presence and business size thereby enhancing their bidding position for large international projects (Seth, Song and Pettit, 2002). Furthermore, with the acquisition of a foreign firm the acquirer also obtains the resources and knowledge for operating successfully under the specific business behavior and law requirements of the respective country (Conklin, 2005). Technological knowledge can also be transferred between the two parties entailing advantage in comparison to the competitors (Morck

and Yeung, 1991). On the other hand international acquisitions bear high risks such as an underestimation of the foreign cultural differences as well as tremendous integration costs (Denis, Denis and Yost, 2002). The following analyses (see Tables 6A-9A in Appendix) reveal whether the domestic or international extension strategy is more advantageous.

Construction firms benefit from international as well as domestic acquisitions. Both groups yield similar average BHAR between 2.5% and 4% at the MV-approach whereas only the domestic results are consistently significant. Contrary, the medians depict values closely above or below zero. When comparing the buy and hold returns (BHR) with the CB-portfolio, international takeovers achieve around 25% and domestic acquisitions 22% BHAR over three years. Most median values are slightly below 1% BHAR for both groups. By comparing the amount of positives to each other, the domestic alternative earns in 60-70% of the cases positive BHAR, except at the MV approach with ca. 50%, and the international alternative oscillates irregularly with positive BHAR between 30-70%. Although acquisitions entail mainly positive wealth effects for both groups, the domestic choice seems to be slightly more advantageous to bidders than the international alternative, which is consistent to the findings of Moeller and Schlingemann (2004).

The BHAR for the non-construction bidder sample outperforms the BHAR for construction companies and additionally depict strong significant results. The BHAR to the MV portfolios aggregates to 17% for both groups on all three observation periods. The MTBV and CB groups accomplish even higher BHAR values and propose international takeovers as the more profitable acquisition option for non-construction firms: While the BHAR of domestic acquisitions depict 22-24% to the MTBV and 16-18% to the CB comparison portfolio, international acquisitions yield on average BHAR between 27% and 29% to both portfolios.

Overall shareholders gain abnormal long-term returns regardless of the regional focus, although some differences could be constituted for the construction and non-construction sample. Nevertheless, several countries like Ireland, Spain, the United Kingdom and the United States underwent a boom in the real estate and subsequently the construction services markets from the mid-nineties through 2007. Due to the high growth expectations for these construction markets, the capital market made higher reward acquisitions than in countries without construction booms. While that phenolmenon does not turn out to be relevant for acqui-

sitions by construction firms, as the BHAR values show similar values, it is highly relevant for take-overs by non-construction firms. Domestic acquisitions within the real estate booming countries yield 30-45% BHAR. On the other hand, the domestic acquisitions within the countries without high growth rates in the construction sector report mainly negative BHAR with losses to the comparing portfolio of up to -1.5%.

3. Success drivers

To illuminate the influence of potential influence factors we detect distinct parameters and investigate by the means of a multivariate regression analysis their effect on the long-term abnormal returns.

Firm specifics of the acquirer:

1. *Leverage*. Bruner (1988) reports rising leverage levels at bidding companies within the first two years after transactions, as debt capital is a common source for financing the deal. Firms with high leverage levels usually spend less in R&D thereby affecting negatively the basis for growth opportunities and the future performance (Sing and Faircloth, 2005).
2. *Earnings per share (EPS-ratio)*. Well performing firms with high EPS-ratios usually indicate a shareholder oriented management. Hence the capital market expects further benefits from M&A activism, as the management is supposed to act in the shareholders interest (Morck, Shleifer and Vishny, 1990)
3. *Tobin's Q*. The Tobin's Q presented by Lang, Stulz and Walkling (1994) allows examining the capability of a management to lead a company successfully on the current and future status. We test, whether good management capabilities (Tobin's $Q > 1$) have an essential role on the success of takeovers. The Tobin's Q is calculated by dividing the market value of assets to the book value of assets.
4. *Systematic risk*. The Beta defines the bidder's systematic risk. Within the regression analysis we test whether the systematic risk has any relevance for the long-term BHAR.

Transaction characteristics:

1. *Strategic focus*. Considering the strategic focus in the multivariate regression analysis we test whether those strategic foci also influence significantly the BHAR in combination with other potential explanatory variables.
2. *Domestic vs. international*. Likewise to the strategic focus, we analyze the effect of the regional focus on the BHAR under the consideration of multiple exogenous variables. We include a variable for all domestic as well as

international acquisitions. Additionally, we split up the group of domestic acquisitions in the construction booming countries to consider the impact of that specific group within the domestic acquisitions.

3. *Private vs. public targets*. Takeovers of private targets usually serve more the shareholder wealth than acquisitions of public targets, because the valuation of private targets leads often to a discount of more than 15% in comparison to similar public companies (Officer, 2007). Fuller, Netter and Stegemoller (2002) support this thesis.

4. *Hostile vs. friendly takeovers*. In friendly takeovers, the target management agrees on the deal, which avoids resistance during the integration process into the bidding company and any premium payments due to bidding competitions. In contrast, in hostile acquisitions acquirers often face a bidding competition and consequently premium payments as well as cultural barriers at the target. This causes higher costs and lower gains for the bidder during the integration process (De, Fedenia and Triantis, 1996). Sudarsanam and Mahate (2006) state that hostile acquisitions outperform the friendly counterpart as hostile acquisitions often focus on underperforming targets.

5. *Method of payment*. Loughran and Vijh (1997) document significantly negative abnormal returns of -25% for only stock financed acquisitions and 61.7% abnormal returns for cash financed acquisitions on a five year horizon after the transaction. In addition to these two forms of payment, we also consider transactions using a mix of stock and cash for paying the acquisition.

Macroeconomic aspects and capital market information:

1. *Stock market bubble*. During the new economy hype at the end of the last millennium, the number of M&A increased as well. If M&A rallies occur, managers often feel the urge to merge instead of thoroughly understanding the acquisition benefits and drawbacks, because the market appears to be advantageous for M&A activities. In the short run M&A and stock market rallies benefit the bidder, but in the long-run those acquisitions often prove to be wealth deteriorating (Petmezas, 2009).

2. *GDP and real estate cycles*. GDP development and real estate cycles are closely linked (Case, Glaeser and Parker, 2000). Hence, the GDP variable does not only provide information about the impact of the general macroeconomic impact of country, but also about the effect of development in the real estate business on the BHAR of acquisitions within the construction industry.

3. *Short-term cumulated abnormal returns (CAR)*. If capital markets correspond to the efficiency thesis by Fama (1992), short-term abnormal returns should significantly affect long-term abnormal returns.

The regression analysis influences the character of the acquisition significantly and its success. Friendly acquisitions seem to realize synergies and to suffer less from high integration costs or transaction premiums than hostile acquisitions. Hence, friendly acquisitions have a positive and the hostile counterpart a negative impact on the shareholder wealth, which coincides with the hypothesis by De, Fedenia and Triantis (1996).

Stock financed acquisitions also depict a significant relevance for acquisitions initiated by construction firms. Unlike the findings of Loughran and Vijh (1997) the general assumption stock financed acquisitions have a positive effect on the accomplished long-term BHAR. According to Petmezas (2009) construction firms lose in the long-run when engaging in acquisitions during a M&A rally. Hence, undergoing an acquisition during a M&A rally only benefits the shareholders in the short-run (Vogt, Kurzrock, Rottke and Schiereck, 2012), and has a negative effect for the owners of the company in the long run.

Table 3. Multivariate regression analysis for bidding construction firms

Explanatory variables	M1	M2	M3	M4	M5	M6	M7
Constant	0.185** (-2.235)	0.0599 (1.1419)	0.413*** (4.226)	0.328*** (3.876)	0.336*** (3.212)	0.319*** (3.601)	0.139 (1.625)
Beta	-0.082 (-1.267)				-0.059 (-0.806)		-0.068 (-0.839)
Leverage		-0.000 (-0.172)				-0.000 (-0.122)	
EPS		-0.001 (=0,484)			-0.000 (-0.637)		-0.001 (-0.793)
Tobin's *Q*	-0.019 (-1.285)		-0.035 (-1.593)		-0.039 (-1.152)		-0.038 (-1.182)
Domestic	-0.055 (-0.822)					-0.041 (-0.629)	

Table 3 (cont.). Multivariate regression analysis for bidding construction firms

Explanatory variables	M1	M2	M3	M4	M5	M6	M7
Domestic IRL, E, UK, US			-0.108* (-1.681)	-0.082 (-1.329)			-0.103 (-1.595)
International		0.051 (0.8058)			0.041 (0.632)		
Friendly	0.222*** (5.477)	0.184*** (4.597)					0.197*** (3.838)
Hostile			-0.192*** (-3.444)		-0.185 (-4.145)	-0.230*** (-5.813)	
Cash financed			-0.077 (-1.143)	-0.054 (-0.860)			
Stock financed		0.173** (2.073)			0.141* (1.723)		0.177** (2.152)
Cash/stock financed	-0.067 (-0.817)					-0.060 (-0.832)	
Private					-0.057 (-0.905)		
Public				0.028 (0.435)			
Horizontal (constr.)			0.101* (1.709)			0.030 (0.535)	0.083 (1.348)
Vertical (constr.)		-0.024 (-0.287)		-0.006 (-0.077)			
Conglomerate (constr.)	-0.083 (-1.121)				-0.099 (-1.464)		
GDP		-0.007 (-0.512)			-0.001 (-0.690)	-0.002 (-1.167)	
Stock market bubble			-0.183*** (-2.956)	-0.135** (-2.210)	-0.127** (-2.220)		0.177** (2.152)
CAR short analysis			0.131 0.132	0.203 (1.138)			
Durbin-Watson	2.223	2.226	2.227	2.290	2.198	2.192	2.236
Adj. R^2	0.062	0.072	0.092	0.037	0.079	0.026	0.111
N obs	198	197	198	216	198	237	182

Notes: This table illustrates the results of the multivariate linear regression model for the three years buy and hold abnormal returns of acquiring construction firms. *, **, *** indicate the statistical significance at the 10%, 5% and 1% level, respectively. The number in brackets presents the t-statistics. All test statistics are computed applying White's (1980) heteroskedasticity-consistent covariance matrix.

Table 4. Multivariate regression analysis for bidding non-construction firms

Explanatory variables	M1	M2	M3	M4	M5	M6	M7
Constant	0.163 (1.135)	-0.111 (-1.228)	0.184 (1.914)	0.556** (2.097)	-0.008 (-0.082)	0.026 (0.289)	-0.125 (-1.348)
Beta	0.207 (1.018)						
Leverage	-0.001 (-2.304)	-0.001*** (-2.607)		-0.001** (-2.330)		-0.001*** (-2.683)	-0.001*** (-2.704)
EPS	0.022*** (2.953)	0.024*** (3.343)	0.024*** (3.089)		0.026*** (4.027)	0.017** (2.233)	0.025 (3.688)
Tobin's Q	0.001 (1.460)	0.001 (1.357)					
Domestic		0.251** (2.353)			0.209* (1.737)		0.279*** (2.721)
Domestic IRL, E, UK, US			-0.037 (-0.297)				
International	-0.211 (-1.562)			-0.216 (-1.461)			
Friendly							
Hostile	0.040 (0.185)						
Cash financed						-0.045 (-0.336)	

Table 4 (cont.). Multivariate regression analysis for bidding non-construction firms

Explanatory variables	M1	M2	M3	M4	M5	M6	M7
Stock financed	-0.048 (-0.336)						
Cash/stock financed			0.026 (0.177)				
Private			-0.057 (-0.484)	-0.014 (-0.116)			
Public	-0.020 (-0.161)					0.018 (0.146)	
Vartical (non-constr.)		0.171* (1.759)				0.319*** (2.891)	
Conglomerate (non-constr.)	-0.174 (-1.022)					0.184 (1.501)	
Financial investment			0.346** (2.537)		0.315*** (2.821)		
Financial instability				-0.381** (-2.271)	-0.163* (-1.864)		
GDP	-0.001 (-0.356)			-0.002 (-0.612)			
Stock market bubble	0.115 (0.706)						
CAR short-term analysis		0.623* (1.704)	0.719* (1.694)		0.812* 1.939		0.775** (2.180)
Durbin-Watson	1.966	1.919	2.018	1.804	2.056	1.817	1.895
Adj. R^2	0.174	0.291	0.135	0.077	0.198	0.182	0.293
N obs	87	89	87	83	88	87	94

Notes: This table illustrates the results of the multivariate linear regression model for the three years buy and hold abnormal returns of acquiring non-construction firms. *, **, *** indicate the statistical significance at the 10%, 5% and 1% level, respectively. The number in brackets presents the *t*-statistics. All test statistics are computed applying White's (1980) heteroskedasticity-consistent covariance matrix.

The strategic and regional foci have an impact on the success of transactions by non-construction corporations. Concentrating on the home-market with familiar accounting and taxation rules and similar cultural values benefits the shareholder wealth more than international diversification regardless whether the home-country undergoes a construction boom. The results for the strategic focus support the findings from the sub-sample analysis. An extension of the value chain by integrating an upstream or downstream construction business and financial investments into the construction industry influence positively excess gains for the acquirer, but takeovers due to financial difficulties of the construction firm entail financial burdens for the acquirer in the long run.

Conclusion

This paper illustrates the long-term wealth effects of acquisitions within the construction industry. The partnering literature provides first implications about the benefits and moral hazard risk avoidance due to cooperation between construction firms, or con-struction firms and their subcontractors. These insights and the introduced specifics of the construction industry imply, in contrast to the findings of cross-industry studies, long-term excess yields for acquisitions within the construction industry. M&A

activities have overall a positive impact on the shareholder value of the bidding company on a one, two and three year perspective, after the acquisition announcement. Construction firms yield average abnormal returns of up to nearly 23% and non-construction firms 25% over a three year horizon.

If the overall sample is classified according to the strategic focus of the acquisition, a distinct picture arises about the advantageousness of the different forms of business extension. Construction bidders gain mainly from market power strengthening horizontal acquisition (up to 25.7% BHAR). Nevertheless, vertical and conglomerate acquisitions also increase the shareholder value with maximum abnormal returns of 18.2% and 21.2% respectively. Hence, a consolidation of the construction market, an enlargement towards up- or downstream related business as well as extensions towards construction alien business seem to benefit construction firms and its shareholders. A similar picture can be drawn for the acquisition by non-construction firms. Those businesses integrating vertically a construction firm earn BHAR of up to 25%.

The regression analysis reveals insights about the success parameters of takeovers within the con-struction industry. Friendly acquisitions lead to positive results while hostile deals generate negative

outcomes. Construction firms purchasing another company with stocks also sustain the shareholder wealth growth, as they do not tighten the scarce liquidity situation at their firms. At non construction firms the capital structure and the performance of the bidding firms seem to essentially affect the transaction success. High leveraged companies engaging in acquisitions obstruct their future growth. Therefore, the capital market evaluates acquisitions by such firms negatively, but rewards on the other hand acquisitions by well performing firms. Those companies act in favor of the shareholder wealth, which includes profitable investments like acquisitions.

However, there are a number of limitations in our study which offer a road to further research. We concentrated on a period which was not affected by extreme optimism or the worldwide financial crisis. It would be interesting to compare our findings with observations from a completely different market environment and rather unusually transactions like that of Microsoft co-founder Bill Gates who announced to buy 6% of Spain's constructor FCC for 155 mn USD on October 22, 2013. The multivariate regression analyses can be extended by additional control variables with respect to governance issues and the overall degree of economic freedom in the home countries of the target companies. And finally, it is possible to analyze the very long-run success of our transaction sample over more than a decade to address the question on long-term stability of internationally acquiring construction firm through the whole business cycle.

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Table 1A. Overall BHAR Analysis

Construction firms; N = 243	Mean	t-value	p-value	Skewness adjusted j-value	Skewness adjusted p-value	Bootstrapped p-value	Median	Z-score	P-value	Positives	Std. dev
One year event period											
MV portfolio	3.04%	1.878*	6.28%	1.932*	5.56%	4.50%**	-0.12%	-0.303	76.20%	44.72%	41.89%
MTBV portfolio	12.22%	4.384***	0.00%	4.498***	0.00%	0.00%	0.55%	-3.441***	0.06%	61.03%	32.52%
Combined portfolio	22/18%	7.299***	0.00%	7.425***	0.00%	0.00%	0.51%	-4.406***	0.00%	57.89%	17.96%
Two years event period											
MV portfolio	3.66%	2.064**	4.11%	2.130**	3.52%	3.10%	0.17%	-0.512	60.84%	53.66%	42.93%
MTBV portfolio	13.06%	4.518***	0.00%	4.640***	0.00%	0.00%	0.88%	-5.218***	0.00%	66.18%	33.71%
Combined portfolio	22.95%	7.369***	0.00%	7.499***	0.00%	0.00%***	0.89%	-5.222***	0.00%	66.32%	19.67%
Three years event period											
MV portfolio	3.41%	2.002**	4.75%	2.065**	4.10%	3.80%**	-0.11%	-0.199	84.20%	47.15%	42.46%
MTBV portfolio	12.74%	4.485***	0.00%	4.605***	0.00%	0.00%***	0.59%	-5.024***	0.00%	64.71%	33.12%
Combined portfolio	22.62%	7.345***	0.00%	7.474***	0.00%	0.00%	0.73%	-4.932***	0.00%	61.05%	18.88%
Non-construction firms; N = 111											
One year event period											
MV portfolio	15.94%	3.002***	0.42%	3.137***	0.29%	0.10%***	0.87%	-2.990***	0.28%	63.27%	41.51%
MTBV portfolio	25.59%	4.015***	0.02%	4.151***	0.01%	0.00%	1.15%	-2.810***	0.50%	57.17%	44.61%
Combined portfolio	21.56%	3.635***	0.07%	3.775***	0.04%	0.00%***	1.15%	-3.198***	0.14%	65.31%	37.17%
Two years event period											
MV portfolio	15.04%	2.828***	0.68%	2.948***	0.49%	0.30%***	0.14%	-1.746*	8.08%	63.27%	41.41%
MTBV portfolio	24.73%	3.888***	0.03%	4.017***	0.02%	0.00%***	0.09%	-1.457	14.50%	55.10%	44.51%
Combined portfolio	20.81%	3.517***	0.10%	3.649***	0.06%	0.00%***	0.36%	-2.481**	1.91%	63.27%	37.22%
Three years event period											
MV portfolio	14.43%	2.772***	0.79%	2.888***	0.58%	0.40%***	0.16%	-2.164**	3.05%	65.31%	41.29%
MTBV portfolio	24.31%	3.839***	0.04%	3.964***	0.02%	0.00%***	0.22%	-1.558	11.95%	59.18%	44.33%
Combined portfolio	20.51%	3.476***	0.11%	3.604***	0.07%	0.00%***	0.30%	-2.482**	1.31%	63.27%	36.44%

Difference test	1 year:			2 years:			3 years:		
Constr. vs. non-constr.	t-value		z-score	t-value		z-score	t-value		z-score
MV portfolio	0.621		0,555	0.742		-0.077	0.743		0.198
MTBV portfolio	-2.275**		-0.061	-2.096**		-0.948	-2.167**		-1.109
Combined portfolio	-1.541		1.502	-1.373		0.552	-1.412		0.845

Notes: *, **, *** indicate the statistical significance at the 10%, 5% and 1% level, respectively.

Table 2A. BHAR of strategic focus

Horizontal; N = 243	Mean	t-value	p-value	Skewness adjusted j-value	Skewness adjusted p-value	Bootstrapped p-value	Median	Wilcoxon z-score	P-value	Positives	Std. dev.
One year event period											
MV portfolio	4.10%	1.620	10.99%	1.686**	9.65%	7.80%*	-0.19%	-0.409	68.23%	41.18%	43.65%
MTBV portfolio	12.06%	3.334***	0.13%	3.454***	0.09%	0.00%***	0.81%	-3.348***	0.08%	65.82%	32.15%
Combined portfolio	24.76%	5.922***	0.00%	6.050***	0.00%	0.00%***	1.18%	-3.608***	0.03%	56.88%	20.87%
Two years event period											
MV portfolio	4.77%	1.682*	9.71%	1.755*	8.38%	6.90%*	0.24%	-0.165	86.90%	52.94%	45.12%
MTBV portfolio	12.77%	3.376***	0.11%	3.501***	0.08%	0.00%***	1.28%	-4.633***	0.00%	67.09%	33.63%
Combined portfolio	25.72%	5.953***	0.00%	6.084***	0.00%	0.00%***	1.01%	-4.192***	0.00%	66.97%	23.37%
Three years event period											
MV portfolio	4.48%	1.653	10.30%	1.724*	8.93%	7.10%*	-0.12%	-0.318	75.07%	45.59%	44.41%
MTBV portfolio	12.38%	3.349***	0.13%	3.470***	0.09%	0.00%***	0.94%	-4.183***	0.00%	68.35%	32.86%
Combined portfolio	25.25%	5.937***	0.00%	6.067***	0.00%	0.00%	0.88%	-3.850***	0.01%	61.47%	22.35%
Vertical; N = 67											
One year event period											
MV portfolio	2.66%	0.992	32.79%	1.067	29.30%	25.20%	0.20%	-0.430	66.72%	54.05%	38.80%
MTBV portfolio	13.85%	2.423**	2.06%	2.548**	1.52%	1.40%**	0.26%	-1.788*	7.38%	59.46%	34.78%
Combined portfolio	17.79%	3.431***	0.11%	3.555***	0.08%	0.10%***	0.46%	-2.-15**	4.39%	60.71%	16.33%
Two years event period											
MV portfolio	3.05%	1.117	27.15%	1.198	23.87%	20.80%	0.76%	-1.064	28.75%	62.16%	38.75%
MTBV portfolio	14.77%	2.582**	1.40%	2.720***	0.99%	0.20%***	0.73%	-2.783***	0.54%	72.97%	34.81%
Combined portfolio	18.16%	3.507***	0.09%	3.634***	0.06%	0.00%***	0.89%	-2.757***	0.58%	69.64%	16.63%
Three years event period											
MV portfolio	2.95%	1.093	28.15%	1.178	24.64%	22.70%	0.09%	-0.717	47.36%	54.05%	38.79%
MTBV portfolio	14.51%	2.537**	1.57%	2.672**	1.13%	0.60%***	0.43%	-2.542**	1.10%	64.86%	34.80%
Combined portfolio	18.19%	3.509***	0.09%	3.637***	0.06%	0.00%***	0.60%	-2.423**	1.54%	62.50%	16.40%
Conglomerate; N = 39											
One year event period											
MV portfolio	-0.18%	0.172	86.51%	0.158	87.66%	88.10%	-0.31%	-0.849	39.58%	38.89%	41.43%
MTBV portfolio	9.47%	1.429	16.88%	1.541	13.89%	13.40%	-0.37%	-0.365	71.51%	47.62%	30.39%
Combined portfolio	20.77%	2.506**	1.94%	2.644**	1.42%	1.10%**	0.27%	-1.547	12.18%	56.00%	4.37%
Two years event period											
MV portfolio	0.73%	0.647	52.63%	0.695	49.65%	49.70%	-0.34%	-0.806	42.04%	38.89%	42.70%
MTBV portfolio	10.56%	1.475	15.59%	1.598	12.58%	10.40%	0.20%	-0.608	54.30%	52.38%	32.81%

Conglomerate; *N* = 39	Mean	*t*-value	*p*-value	Skewness adjusted *j*-value	Skewness adjusted *p*-value	Bootstrapped *p*-value	Median	Wilcoxon *z*-score	*P*-value	Positives	Std. dev.
Combined portfolio	21/60%	2.529**	1.84%	2.671**	1.34%	0.00%***	0.17%	-1.359	17.42%	56.00%	4.77%
Three years event period											
MV portfolio	0.30%	0.573	57.44%	0.597	55.83%	53.20%	-0.54%	-0.240	81.07%	38.89%	42.34%
MTBV portfolio	10.43%	1.503	14.84%	1.630	11.87%	10.80%	0.57%	-1.477	13.96%	52.38%	31.78%
Combined portfolio	21.09%	2.490**	2.01%	2.630**	1.47%	0.50%***	0.70%	-2.005**	4.50%	56.00%	2.25%

Notes: *, **, *** indicate the statistical significance at the 10%, 5% and 1% level.

Table 3A. Difference test of BHAR of strategic focus

Difference test	1 year:		2 years:		3 years:	
Horizontal vs. vertical	*t*-value	*z*-score	*t*-value	*z*-score	*t*-value	*z*-score
MV portfolio	0.363	0.472	0.395	0.395	0.367	0.472
MTBV portfolio	0.321	-0.510	0.346	0.346	0.370	-0.401
Combined portfolio	1.008	-0.545	1.068	1.068	1.009	-0.607
Horizontal vs. conglomerate						
MV portfolio	0.861	0.262	0.727	0.007	0.788	0.471
MTBV portfolio	0.332	-1.324	0.270	-1.502	0.244	-0.842
Combined portfolio	0.417	-0.109	0.416	-0.503	0.427	-0.086
Vertical vs. conglomerate						
MV portfolio	0.722	-0.221	0.579	-0.819	0.678	-0.169
MTBV portfolio	0.514	-1.067	0.487	-1.183	0.477	-0.422
Combined portfolio	0.312	0.199	0.358	-0.118	0.302	0.343

Table 4A. BHAR of vertical and conglomerate takeovers of non-construction firms

Vertical integration; N = 71	Mean	t-value	p-value	Skewness adjusted j-value	Skewness adjusted p-value	Bootstrapped p-value	Median	Wilcoxon z-score	P-value	Positives	Std. dev.
One year event period											
MV portfolio	15.30%	2.158**	3.96%	2.286**	3.00%	1.50%*	-0.09%	-1.114	26.53%	48.28%	44.59%
MTBV portfolio	24.64%	2.932***	0.66%	3.062***	0.48%	0.30%***	-0.43%	-1.049	29.43%	44.83%	45.25%
Combined portfolio	25.01%	3.020***	0.53%	3.157***	0.38%	0.30%***	0.87%	-2.087*	8.17%	62.07%	38.18%
Two years event period											
MV portfolio	14.84%	2.108**	4.41%	2.231**	3.39%	2.10%**	0.30%	-0.724	46.87%	55.17%	44.18%
MTBV portfolio	24.23%	2.922***	0.68%	3.052***	0.49%	0.40%***	-0.05%	-0.746	45.56%	48.28%	44.65%
Combined portfolio	24.49%	2.985***	0.58%	3.120***	0.42%	0.30%***	0.44%	-2.519**	1.18%	68.97%	37.91%
Three years event period											
MV portfolio	14.36%	2.121**	4.29%	2.245**	3.28%	2.30%**	0.29%	-2.498**	1.85%	68.97%	43.92%
MTBV portfolio	24.12%	2.940***	0.65%	3.071***	0.47%	0.30%***	0.26%	-1.503	13.29%	62.07%	44.18%
Combined portfolio	24.33%	2.984***	0.58%	3.118***	0.42%	0.80%***	0.46%	-2.519**	1.18%	68.97%	36.45%
Conglomerate takeover; N = 17											
One year event period											
MV portfolio	29.86%	1.565	16.85%	1.720	13.62%	10.60%	2.41%	-	-	57.14%	52.86%
MTBV portfolio	30.63%	1.621	15.61%	1.765	12.45%	13.50%	2.41%	-	-	71.43%	49.98%
Combined portfolio	56.36%	2.820**	3.03%	2.693**	3.59%	2.80%**	13.22%	-	-	71.43%	50.47%
Two years event period											
MV portfolio	29.27%	1.548	17.26%	1.701	13.99%	11.80%	0.06%	-	-	57.14%	53.54%
MTBV portfolio	29.62%	1.572	16.69%	1.728	13.48%	15.90%	0.06%	-	-	57.14%	49.84%
Combined portfolio	57.00%	2.816**	3.05%	2.684**	3.64%	2.60%**	17.00%	-	-	71.43%	50.02%
Three years event period											
MV portfolio	29.37%	1.584	16.44%	1.742	13.22%	11.50%	1.90%	-	-	57.14%	53.12%
MTBV portfolio	29.30%	1.578	16.56%	1.735	13.34%	15.20%	1.90%	-	-	57.14%	49.13%
Combined portfolio	57.18%	2.847**	2.93%	2.701**	3.51%	2.40%**	17.80%	-	-	71.43%	49.06%
Difference test	1 year:			2 years:			3 years:				
Vertical vs. conglomerate (NC)	t-value	z-score		t-value	z-score		t-value	z-score			
MV portfolio	0.831	-		0.189	-		0.992	-			
MTBV portfolio	0.080	-		0.125	-		0.164	-			
Combined portfolio	0.137	0.201		0.155	0.101		0.149	0.302			

Notes: *, **, *** indicate the statistical significance at the 10%, 5% and 1% level; NC refers to non-construction firms.

Investment background; *N* = 15	Mean	*t*-value	*p*-value	Skewness adjusted *j*-value	Skewness adjusted *p*-value	Bootstrapped *p*-value	Median	Wilcoxon *z*-score	*P*-value	Positives	Std. dev.
One year event period											
MV portfolio	24.79%	1.492	17.95%	1.641	14.48%	17.50%	1.15%	-	-	66.67%	55.83%
MTBV portfolio	37.39%	1.984*	8.76%	2.093*	7.47%	6.80%*	0.55%	-	-	60.00%	53.31%
Combined portfolio	50.78%	2.228*	7.63%	2.228*	6.63%	5.70%*	51.02%	-	-	86.67%	47.00%
Two years event period											
MV portfolio	25.46%	1.543	16.67%	1.701	13.27%	14.80%	0.44%	-	-	100.00%	55.69%
MTBV portfolio	37.78%	2.012*	8.40%	2.124*	7.13%	6.10%*	0.77%	-	-	80.00%	53.09%
Combined portfolio	51.03%	2.244*	7.48%	2.245*	6.48%	5.10%*	50.76%	-	-	100.00%	46.68%
Three years event period											
MV portfolio	25.56%	1.550	16.50%	1.710	13.10%	14.20%	0.74%	-	-	100.00%	55.63%
MTBV portfolio	37.59%	1.995*	8.62%	2.105*	7.33%	6.30%*	0.38%	-	-	66.67%	53.29%
Combined portfolio	51.13%	2.251*	7.41%	2.252*	6.41%	7.50%*	50.93%	-	-	100.00%	46.64%
Financial problems; *N* = 8											
One year event period											
MV portfolio	1.74%	2.669**	4.44%	2.711**	4.22%	3.30%**	1.52%	-	-	100.00%	39.02%
MTBV portfolio	3.12%	4.619***	0.57%	3.678**	1.43%	3.10%**	3.43%	-	-	100.00%	44.52%
Combined portfolio	2.67%	3.231**	2.32%	3.029**	2.91%	1.90%**	3.04%	-	-	100.00%	39.02%
Two years event period											
MV portfolio	0.22%	1.095	32.35%	1.132	30.87%	34.20%	0.12%	-	-	62.50%	38.81%
MTBV portfolio	-0.11%	-0.205	84/59%	-0.250	81.25%	85.80%	0.30%	-	-	50.00%	44.19%
Combined portfolio	-0.18%	-0.342	74.61%	-0.398	70.69%	68.70%	0.12%	-	-	25.00%	38.95%
Three years event period											
MV portfolio	-0.34%	-1.725	14.51%	-1.905	11.52%	13.60%	-0.31%	-	-	25.00%	38.25%
MTBV portfolio	-0.97%	-1.069	33.38%	-1.253	26.54%	30.40%	-0.17%	-	-	50.00%	43.48%
Combined portfolio	-1.13%	-1.256	26.45%	-1.473	20.08%	15.90%	-0.31%	-	-	25.00%	38.29%
Difference test	1 year:			2 years:			3 years:				
Investment vs. fin. prob. (NC)	*t*-value	*z*-score		*t*-value	*z*-score		*t*-value	*z*-score			
MV portfolio	-1.376	-		0.161	-		1.706	-			
MTBV portfolio	0.607	-		0.649	-		0.644	-			
Combined portfolio	1.655	-		1.734	-		1.759	-			

Notes: *, **, *** indicate the statistical significance at the 10%, 5% and 1% level; NC refers to non-construction firms.

Table 6A. International vs. domestic takeovers by construction firms

International; N = 55	Mean	t-value	p-value	Skewness adjusted j-value	Skewness adjusted p-value	Bootstrapped p-value	Median	z-score	P-value	Positives	Std. dev.
One year event period											
MV portfolio	2.86%	0.746	46.24%	0.812	42.47%	40.20%	-0.76%	-1.308	19.09%	30.77%	43.69%
MTBV portfolio	2.69%	0.826	41.56%	0.894	37.86%	36.90%	-0.25%	-0.833	40.48%	40.00%	17.83%
Combined portfolio	24.15%	3.496***	0.12%	3.620***	0.08%	0.00%***	-0.07%	-1.384	16.62%	47.50%	19.51%
Two years event period											
MV portfolio	3.64%	0.972	34.02%	1.062	29.82%	26.80%	0.24%	-0.292	77.02%	57.69%	43.92%
MTBV portfolio	3.83%	1.099	28.07%	1.200	23.98%	24.30%	0.44%	-1.244	21.34%	53.33%	19.10%
Combined portfolio	25.18%	3.625***	0.08%	3.760***	0.06%	0.00%***	1.07%	-2.809	0.49%***	70.00%	19.11%
Three years event period											
MV portfolio	3.67%	0.973	33.98%	1.064	29.74%	27.40%	-0.07%	-0.013	98.99%	46.15%	43.84%
MTBV portfolio	4.01%	1.170	25.15%	1.280	21.07%	19.20%	0.39%	-1.759	7.86%*	56.67%	18.76%
Combined portfolio	25.05%	3.613***	0.09%	3.747***	0.06%	0.00%	0.81%	-2.608	0.91%***	65.00%	19.25%
Domestic; N = 188											
One year event period											
MV portfolio	3.09%	1.727%	8.74%	1.788*	7.70%	8.60%*	-0.04%	-0.322	74.74%	48.45%	41.53%
MTBV portfolio	14.92%	4.366***	0.00%	4.493***	0.00%	0.00%***	0.83%	-4.165	0.00%***	66.98%	35.19%
Combined portfolio	21.66%	6.386***	0.00%	6.515***	0.00%	0.00%***	0.86%	-4.249	0.00%***	60.67%	17.63%
Two years event period											
MV portfolio	3.67%	1.813*	7.30%	1.880*	6.31%	5.30%*	0.11%	-0.480	63.10%	52.58%	42.79%
MTBV portfolio	15.67%	4.425***	0.00%	4.556***	0.00%	0.00%***	1.03%	-5.189	0.00%***	69.81%	36.46%
Combined portfolio	22.36%	6.399***	0.00%	6.528***	0.00%	0.00%***	0.85%	-4.459	0.00%***	65.33%	19.91%
Three years event period											
MV portfolio	3.34%	1.741*	8.50%	1.805*	7.42%	6.20%*	-0.20%	-0.221	82.49%	47.42%	42.21%
MTBV portfolio	15.21%	4.367***	0.00%	4.495***	0.00%	0.00%***	0.88%	-4.764	0.00%***	66.98%	35.85%
Combined portfolio	21.98%	6.377***	0.00%	6.505***	0.00%	0.00%***	0.71%	-4.209	0.00%***	60.00%	18.88%

Difference test	1 year:		2 years:		3 years:	
International vs. domestic	t-value	z-score	t-value	z-score	t-value	z-score
MV portfolio	0.059	-0.286	0.005	0.137	-0.081	0.435
MTBV portfolio	1.835*	-2.732***	1.710*	-1.771*	1.646	-1.079
Combined portfolio	0.333	-0.814	0.368	0.422	-0.406	0.205

Notes: *, **, *** indicate the statistical significance at the 10%, 5% and 1% level; NC refers to non-construction firms.

Table 7A. International vs. domestic takeovers by non-construction firms

International; N = 39	Mean	t-value	p-value	Skewness adjusted j-value	Skewness adjusted p-value	Bootstrapped p-value	Median	z-score	P-value	Positives	Std. dev.
One year event period											
MV portfolio	17.82%	1.945*	6.85%	2.093*	5.17%	3.40%**	0.69%	-1.809*	7.04%	61.11%	45.89%
MTBV portfolio	28.80%	2.644**	1.70%	2.788**	1.26%	2.20%*	0.96%	-2.243**	2.49%	66.67%	46.21%
Combined portfolio	28.59%	2.643**	1.71%	2.787**	1.26%	1.20%**	0.71%	-2.417**	1.89%	72.22%	38.87%
Two years event period											
MV portfolio	17.09%	1.861*	8.01%	1.999*	6.18%	4.20%**	0.26%	-1.765	7.75%	72.22%	45.85%
MTBV portfolio	27.68%	2.540**	2.11%	2.675**	1.60%	2.40%**	0.57%	-1.746	7.77%	66.67%	46.23%
Combined portfolio	27.70%	2.563**	2.02%	2.701**	1.52%	1.10%**	0.30%	-2.156**	4.75%	77.78%	38.95%
Three years event period											
MV portfolio	17.06%	1.873*	7.84%	2.013*	6.03%	4.10%**	0.57%	-2.507**	1.22%	77.78%	46.23%
MTBV portfolio	27.79%	2.532**	2.15%	2.665**	1.63%	2.50%**	0.44%	-1.938*	5.26%	72.22%	46.58%
Combined portfolio	27.97%	2.567**	2.00%	2.704**	1.51%	0.60%***	0.52%	-2.635**	1.08%	77.78%	38.65%
Domestic; N = 72											
One year event period											
MV portfolio	17.27%	2.464**	1.97%	2.599**	1.44%	0.80%***	1.01%	-2.215**	2.68%	64.52%	39.02%
MTBV portfolio	23.27%	2.910***	0.67%	3.041***	0.49%	0.10%***	0.40%	-1.489	13.64%	51.61%	44.52%
Combined portfolio	17.48%	2.493**	1.84%	2.629**	1.34%	0.70%***	1.15%	-2.058**	3.96%	64.52%	39.02%
Two years event period											
MV portfolio	16.59%	2.371**	2.44%	2.496**	1.83%	1.20%**	0.30%	-1.647*	9.97%	64.52%	38.81%
MTBV portfolio	22.83%	2.876***	0.73%	3.005***	0.53%	0.10%***	-0.19%	-0.647	51.78%	48.39%	44.19%
Combined portfolio	16.82%	2.413**	2.21%	2.541**	1.64%	2.80%**	0.36%	-1.333	12.64%	58.06%	38.95%
Three years event period											
MV portfolio	16.24%	2.361**	2.49%	2.485**	1.87%	1.00%***	0.11%	-1.313	18.91%	61.29%	38.25%
MTBV portfolio	22.47%	2.878***	0.73%	3.006***	0.53%	0.20%***	0.01%	-0.568	56.98%	51.61%	43.48%
Combined portfolio	16.21%	2.359**	2.50%	2.483**	1.88%	1.10%**	0.11%	-1.333	18.27%	58.06%	38.29%
Difference test	1 year:			2 years:			3 years:				
International vs. domestic	t-value	z-score		t-value	z-score		t-value	z-score			
MV portfolio	0.860	-		0.112	-		-1.033	-			
MTBV portfolio	-1.501	1.775		-1.457	1.323		-1.483	1.388			
Combined portfolio	-1.184	0.642		-1.187	0.688		-1.259	1.560			

Notes: *, **, *** indicate the statistical significance at the 10%, 5% and 1% level; NC refers to non-construction firms.

Table 8A. Detailed analysis of domestic takeovers of construction firms

Domestic takeovers within E, IRL, UK, US; $N = 128$	Mean	t-value	p-value	Skewness adjusted j-value	Skewness adjusted p-value	Bootstrapped p-value	Median	z-score	P-value	Positives	Std. dev.
One year event period											
MV portfolio	2.78%	1.252	21.49%	1.307	19.59%	17.60%	-0.13%	-0.195	84.55%	43.94%	40.69%
MTBV portfolio	15.23%	3.608***	0.06%	3.740***	0.04%	0.00%***	1.18%	-4.028***	0.01%	71.83%	35.56%
Combined portfolio	19.74%	4.900***	0.00%	5.022***	0.00%	0.00%***	0.43%	-2.696***	0.70%	55.88%	18.04%
Two years event period											
MV portfolio	3.24%	1.421	16.00%	1.487	14.18%	13.10%	0.08%	-0.176	86.06%	51.52%	40.78%
MTBV portfolio	15.57%	3.686***	0.04%	3.822***	0.03%	0.10%***	1.25%	-4.647***	0.00%	73.24%	35.61%
Combined portfolio	20.06%	4.967***	0.00%	5.092***	0.00%	0.00%***	0.74%	-2.866***	0.42%	62.75%	18.52%
Three years event period											
MV portfolio	3.06%	1.390	16.92%	1.456	15.03%	15.10%	-0.41%	-0.335	73.73%	48.48%	40.47%
MTBV portfolio	15.12%	3.612***	0.06%	3.744***	0.04%	0.10%***	0.93%	-4.252***	0.00%	69.01%	35.28%
Combined portfolio	19.91%	4.969***	0.00%	5.095***	0.00%	0.00%***	0.60%	-2.806***	0.50%	59.80%	17.91%
Domestic takeovers excluding E, IRL, UK, US; $N = 60$											
One year event period											
MV portfolio	3.75%	1.229	22.85%	1.336	19.15%	17.80%	0.09%	-0.882	37.79%	58.06%	43.42%
MTBV portfolio	14.31%	2.423**	2.09%	2.550**	1.55%	1.70%**	0.40%	-1.638	10.14%	57.14%	34.94%
Combined portfolio	25.73%	4.105***	0.02%	4.247***	0.01%	0.00%***	1.43%	-3.487***	0.05%	70.83%	17.00%
Two years event period											
MV portfolio	4.57%	1.112	27.52%	1.207	23.69%	19.80%	0.26%	-1.019	30.82%	54.84%	46.85%
MTBV portfolio	15.87%	2.428**	2.06%	2.558**	1.52%	1.30%**	0.86%	-2.391**	1.68%	62.86%	38.67%
Combined portfolio	27.25%	4.029***	0.02%	4.168***	0.01%	0.00%***	1.04%	-3.641***	0.03%	70.83%	22.89%
Three years event period											
MV portfolio	3.92%	1.033	30.99%	1.123	27.04%	26.80%	-0.12%	-0.803	42.17%	45.16%	45.82%
MTBV portfolio	15.38%	2.426**	2.07%	2.555**	1.53%	1.10%**	0.55%	-2.195**	2.82%	62.86%	37.52%
Combined portfolio	26.37%	3.987***	0.02%	4.122***	0.02%	0.10%***	1.24%	-3.272***	0.11%	60.42%	21.12%
Difference test	1 year:			2 years:			3 years:				
E, IRL, UK, US vs. other domestics	t-value	z-score		t-value	z-score		t-value	z-score			
MV portfolio	-0.251	0.601		-0.305	0.244		-0.206	0.284			
MTBV portfolio	0.125	-1.064		-0.038	-0.910		-0.034	-0.863			
Combined portfolio	-0.822	-0.414		-0.959	0.845		-0.873	0.628			

Notes: *, **, *** indicate the statistical significance at the 10%, 5% and 1% level; NC refers to non-construction firms.

Domestic takeovers within E, IRL, UK, US; *N* = 33	Mean	*t*-value	*p*-value	Skewness adjusted *j*-value	Skewness adjusted *p*-value	Bootstrapped *p*-value	Median	*z*-score	*P*-value	Positives	Std. dev.
One year event period											
MV portfolio	44.74%	3.488***	0.30%	3.587***	0.25%	0.10%***	3.43%	-3.390***	0.07%	88.24%	48.79%
MTBV portfolio	42.79%	3.326***	0.43%	3.413***	0.36%	0.10%***	3.43%	-2.249**	2.45%	64.71%	53.04%
Combined portfolio	31.59%	2.669**	1.68%	2.810**	1.26%	0.90%***	2.92%	-2.961**	1.77%	70.59%	52.87%
Two years event period											
MV portfolio	43.31%	3.347***	0.41%	3.438***	0.34%	0.20%***	0.83%	-2.537**	2.12%	70.59%	48.45%
MTBV portfolio	42.29%	3.315***	0.44%	3.402***	0.36%	0.50%***	0.83%	-1.682*	9.27%	52.94%	52.60%
Combined portfolio	30.97%	2.635**	1.80%	2.774**	1.35%	0.50%***	0.62%	-2.140**	3.95%	58.82%	53.36%
Three years event period											
MV portfolio	42.14%	3.328***	0.43%	3.416***	0.35%	0.20%***	0.11%	-1.304	19.23%	58.82%	47.62%
MTBV portfolio	41.65%	3.319***	0.43%	3.406***	0.36%	0.30%***	0.26%	-1.675*	9.39%	58.82%	51.73%
Combined portfolio	30.30%	2.623**	1.84%	2.762**	1.39%	0.60%***	0.40%	-1.734*	8.40%	58.82%	52.20%
Domestic takeovers excluding E, IRL, UK, US; *N* = 39											
One year event period											
MV portfolio	-0.35%	-0.860	40.54%	-0.877	39.67%	43.10%	-0.15%	0.663	70.56%	50.00%	2.63%
MTBV portfolio	-0.79%	-1.232	23.96%	-1.208	24.85%	20.90%	-0.67%	1.224	17.26%	28.57%	2.39%
Combined portfolio	0.34%	0.487	63.43%	0.488	63.36%	59.30%	0.63%	0.739	54.16%	57.14%	1.50%
Two years event period											
MV portfolio	0.13%	0.468	64.78%	0.473	64.39%	68.50%	0.19%	0.887	48.74%	64.29%	2.58%
MTBV portfolio	-1.17%	-2.067*	5.92%	-2.126*	5.32%	3.60%**	-1.04%	1.732*	7.85%	35.71%	2.12%
Combined portfolio	-0.36%	-0.520	61.20%	-0.528	60.63%	55.60%	0.19%	0.386	90.32%	57.14%	1.00%
Three years event period											
MV portfolio	0.19%	0.846	41.28%	0.866	40.22%	43.60%	0.19%	1.082	28.66%	71.43%	3.11%
MTBV portfolio	-1.49%	-1.948*	7.33%	-2.111*	5.47%	3.80%**	-0.97%	1.859*	6.76%	35.71%	2.87%
Combined portfolio	-0.89%	-1.076	30.15%	-1.142	27.40%	25.30%	0.06%	0.503	85.52%	57.14%	0.83%
Difference test	1 year:			2 years:			3 years:				
E, IRL, UK, US vs. other domestics	*t*-value	*z*-score		*t*-value	*z*-score		*t*-value	*z*-score			
MV portfolio	1.145	-		-0.653	-		-1.952	-			
MTBV portfolio	1.162	1.674		1.161	2.830***		1.176	2.149**			
Combined portfolio	2.114**	-		2.077*	-		2.077*	-			

Notes: *,**, *** indicate the statistical significance at the 10%, 5% and 1% level; NC refers to non-construction firms.