The Characteristics of Bidding Firms and the Likelihood of Cross-border Acquisitions

Han Donker, Ph.D., University of Northern British Columbia, Canada
Saif Zahir, Ph.D., University of Northern British Columbia, Canada

ABSTRACT

This paper investigates the firm characteristics of bidding firms in cross-border acquisitions. We find that the likelihood of cross-border acquisitions increases with the size of bidding firms and with the performance of bidding firms. These results indicate that large and high performing bidding firms choose foreign targets firms over domestic target firms. Further, foreign acquisitions generate significant positive abnormal returns to bidding firms. In addition, the cumulative average abnormal returns to bidding firms over the event window around the announcement day [-1, 0, 1] is significant higher for foreign acquisitions in comparison with domestic acquisitions. Finally, we find that the likelihood of cross-border acquisitions decreases with the leverage of bidding firms, which indicate that only bidding firms with a solid financial position are engaged in foreign acquisitions.

Keywords: Takeovers, international mergers and acquisitions, foreign direct investments, event-study methodology, logistic regression analysis

INTRODUCTION

Although globalization and deregulation of international financial markets have given a large number of firms access to foreign markets, research on the motives for foreign acquisitions is relatively scarce. The economics literature mentions several hypotheses such as exchange rate changes, tax and accounting advantages, development of new technologies and managerial know-how (research and development) and market imperfections.

Our paper differs significantly from previous studies in a number of respects. Most previous research on foreign takeovers has focused on the internalization hypothesis and the synergy hypothesis of corporate takeovers. This paper examines the characteristics of bidding firms that are engaged in foreign acquisitions. We find that the likelihood of cross-border acquisitions increases with the size of bidding firms and with the performance of bidding firms. These results indicate that large and high performing bidding firms choose foreign targets firms over domestic target firms. Further, foreign acquisitions generate significant positive abnormal returns to bidding firms. In addition, the cumulative average abnormal returns to bidding firms over the event window around the announcement day [-1, 0, 1] is significant higher for foreign acquisitions in comparison with domestic acquisitions. Finally, we find that the likelihood of cross-border acquisitions decreases with the leverage of bidding firms, which indicate that only low leveraged bidding firms acquire foreign target firms.

PREVIOUS RESEARCH AND HYPOTHESES DEVELOPMENT

Theories on foreign direct investments (FDI) suggest that firms will acquire foreign companies to take advantage of market imperfections such as faulty product and factor markets (Kindleberger, 1969), imperfections and asymmetries in capital markets (Froot and Stein, 1991), vanquishing trade barriers, the possibility of using lead positions in technological and managerial know-how, and differences in tax regimes between countries (Servaes and Zenner, 1994). Eun, Kolodny and Scheraga (1996) argue that cross-border acquisitions can be motivated by buying and internalizing intangible assets of foreign target firms. Bidding firms can generate benefits when they use these intangible assets on a larger scale. This motivation is aligned with the synergy hypothesis. The empirical research on cross-border acquisitions is focused on US bidding and foreign target firms, as well as foreign bidders and US target firms. Eun, Kolodny and Scheraga (1996) test the synergy hypothesis as well as the internalization theory, using a sample of 255 cross-border
acquisitions of US firms during the period 1979 through 1990. In order to test the synergy hypothesis, they estimate the total gains using a paired sample of 103 bidding and target firms following the method of Bradley, Desai and Kim (1988). They show that cross-border acquisitions create significant net benefits, as a result that supports the synergy hypothesis. However, foreign bidding firms experienced on average a wealth reduction (although statistically insignificant), while US targets generated significant net positive gains. On the other hand, Kang (1993) finds positive returns for Japanese bidders as well as US targets, which is consistent with the theory of foreign direct investments (FDI). The internalization theory posits that foreign direct investments (FDI) should occur when a firm is able to generate wealth by internalizing markets of its intangible assets. Firms with technical know-how or managerial know-how can exploit these intangible assets on a larger scale in foreign countries by acquiring foreign target firms. Morck and Yeung (1992) find support for the internalization theory. They distinguish between small and large bidders. Smaller bidders with high research and development expenses, and larger bidders with high advertising expenditures, create positive abnormal returns. We expect positive abnormal bidder returns for bidding firms which acquire foreign target firms. Formally stated:

**H1:** Bidding firms which acquire foreign target firms will generate positive abnormal returns at announcement day.

Kang (1993) find statistically significant positive abnormal returns for Japanese bidding firms which acquire U.S. target firms. Eckbo and Thorburn (2000) find that U.S. bidders in Canada earn statistically insignificant abnormal returns. At the same time, domestic bidders (Canadian firms) realize significantly positive abnormal returns when they acquire Canadian target firms. They show that the most profitable domestic takeovers are the ones where the bidding and target firm have similar size. In their sample, the U.S. bidders are, on average, eight times the size of their Canadian counterparts, which suggest that the insignificant abnormal returns to U.S. bidders reflect a measurement problem. We expect that large bidders will generate net benefits when they acquire a foreign target firm. Stated formally:

**H2:** The probability of a cross-border acquisition increases with the size of the bidding firm.

Eun, Kolodny and Scheraga (1996) test the reverse-internalization hypothesis, which means that bidding firms are driven by reverse internalization of intangible assets owned by target firms. In that case, the gains of the bidding firm will be positively related to the target’s (rather than to its own) intangible assets. Bidders acquire foreign target firms and then acquire and internalize their intangible assets. They find that foreign bidders significantly benefit from the research and development capabilities of US targets, a result that supports the reverse-internalization hypothesis.

On the other hand, Cakici, Hessel and Tandon (1996) find no significant empirical evidence between the target firm’s research and development intensity and the bidder’s abnormal returns. They do find evidence of significant positive bidder wealth, when foreign firms acquire US targets - although the determinants of these gains are weak, such as tax incentives, competition, relative size, the level of research and development intensity, the degree of overseas exposure and the effect of exchange rate fluctuations.

Servaes and Zenner (1994) report that the U.S. tax system has a substantial impact on the benefits of foreign acquisitions in the United States. Froot and Stein (1991) argue that cross-border acquisitions are based on imperfections and information asymmetries in capital markets. A depreciation of the target’s exchange rate increases the relative net wealth position of the bidding firm. As a consequence, the relative cost of capital of the bidding firm will decrease. Therefore, Froot and Stein (1991) predict that a depreciation of the foreign currency of the target firm leads to purchasing advantages (lower cost of capital). Kang (1993) shows that exchange rate movements of the dollar (devaluation) significantly increase Japanese bidder returns.

Another explanation of the positive returns to bidders is the strong incentive for Japanese financial institutions to monitor the performance of the bidder’s management. Foreign acquisitions enclose more uncertainties for bidding firms. Tax differences between countries and foreign exchange rate movements cause uncertainties for bidding firms. Large debt and bank loans (leverage) encourage the monitoring of bidder’s activities and restrain managers from acquiring value-diminishing foreign direct investments (FDI). As a result, the probability of value-reducing foreign acquisitions will decrease with leverage of the bidding firm. Stated formally:

**H3:** The probability of a cross-border acquisition decreases with the leverage of the bidding firm.
Gonzales, Vasconcellos and Kish (1997) find empirical evidence for the undervaluation-target hypothesis for US targets. They hypothesize that U.S. firms are more likely to be targets of foreign bidding firms when they are being undervalued. They use Tobin’s $q$ as a proxy for measuring management performance. They suggest that financial markets will reward well-managed firms with a high $q$-ratio. A $q$-ratio greater than one is interpreted as a measure of good managerial performance, and a $q$-ratio below one is considered to be evidence of poor management. Bidding firms with capable management will benefit from acquisition. Bidding firms as well as target firms will benefit and the total takeover gains will increase when bidding firms acquire poorly managed targets.

Further, well-managed targets (high $q$-ratio) will gain less from acquisitions than poorly managed targets. Gonzales, Vasconcellos and Kish (1997) find an inverse relation between the probability of a US firm being acquired and Tobin’s $q$, which is consistent with the undervaluation-target hypothesis.

We expect that well-managed bidding firms will be more likely involved in cross-border takeovers. Formally stated:

**H4:** The probability of a cross-border acquisitions increases with the performance of the bidding firm.

## SAMPLE AND METHODOLOGY

### Sample

The sample contains 159 bidding firms over the period 1987-1996 on the Amsterdam Stock Exchange (AEX). For each bidding firm, we collect financial data from Datastream. Merger and acquisition transactions, announcement days and initial shareholdings of bidding firms in foreign targets (toehold) are collected from the Dutch Financial Times.

### Table 1: Descriptive Statistics and Correlation Matrix

This Table contains the summary statistics of 159 bidding firms listed on the AEX. Market-to-book value (MTB) is the market value over the common equity of the bidder, where market value is obtained by multiplying the number of outstanding shares of bidder by its closing market price on the 21st day before the first announcement. Leverage (LEV) is the book value of total debt over the book value of total assets of the bidder. The market value (VAL) is expressed in millions of guilders. Return on assets (ROA) is equal to earnings before interest and taxes divided by the book value of total assets of the bidder. Toehold (TOE) of the bidder is the percentage owned by the bidder prior to the acquisition. All accounting data are obtained from the last annual report prior to the announcement of the acquisition.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>MTB</th>
<th>LEV</th>
<th>VAL</th>
<th>ROA</th>
<th>TOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTB</td>
<td>2.22</td>
<td>1.67</td>
<td>0.16</td>
<td>15.80</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>61.68</td>
<td>61.65</td>
<td>8.64</td>
<td>95.80</td>
<td>0.210</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAL</td>
<td>1,879</td>
<td>391.43</td>
<td>7.70</td>
<td>27,467.82</td>
<td>0.226</td>
<td>0.123</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>9.31</td>
<td>9.41</td>
<td>-8.46</td>
<td>39.73</td>
<td>0.478</td>
<td>-0.178</td>
<td>-0.005</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>TOE</td>
<td>6.36</td>
<td>0.00</td>
<td>0.00</td>
<td>80.00</td>
<td>0.090</td>
<td>-0.010</td>
<td>0.030</td>
<td>0.031</td>
<td>X</td>
</tr>
</tbody>
</table>

The results in Table 1 show the descriptive statistics of our sample of 159 bidding firms. The mean and median are for market-to-book ratio (MTB), leverage (LEV) and return on assets (ROA) almost identical. The average market-to-book value is 2.22. On average, bidding firms have a toehold of 6.36 percent in the target firm. The market capitalization of bidding firms (VAL) shows a substantial spread. The smallest bidding firm has a market capitalization of 7.7 million and the largest bidding firm shows a market value of 27,467 million.

In right panel of Table 1, we present the correlation coefficients of the sample. The correlation coefficients are relatively low, except for the correlation coefficients of return on assets (ROA) and the market-to-book ratio (MTB).

### Event-study Methodology

We compute abnormal returns using event-study methodology. Daily stock returns are used to estimate the abnormal returns associated with the takeover event. For each security we determine an estimation period and an examination period. The estimation period starts at trading day -270 and ends at trading day -21 relative to the takeover event. The event period (or sometimes called the examination period) starts 5 trading days prior to the event day ($t=0$) through 5 trading days after the first announcement on the event day ($t=0$). The length of the event period is based on the findings of previous studies. An event period of 11 days around the event day seems to be a proper window to measure the cumulative abnormal returns. For Dutch bidding firms, we use the Herbeleggings-Index as the benchmark index.
Stock returns are measured as follows: \( R_{i,t} = \frac{P_{i,t} - P_{i,t-1} + D_{i,t}}{P_{i,t-1}} \), where \( P_{i,t} \) is defined as the stock price for security \( i \) on day \( t \), and \( D_{i,t} \) is defined as the dividend for security \( i \) on day \( t \). \( R_{i,t} \) is defined as the return for security \( i \) at day \( t \).

For each security \( i \), we estimate different measures of abnormal returns \( AR_{i,t} \).

**Market model:**
\[
AR_{i,t} = R_{i,t} - (\hat{z} + \hat{\beta} R_{m,t})
\]

where \( \hat{z} \) and \( \hat{\beta} \) are OLS values from the estimation period prior to the event window (270 to 21 trading days before the first bid announcement).

In order to test the null hypothesis (\( H_0: AAR_t = 0 \)) that the average abnormal return \( AAR_t \) of the portfolio of firms in the sample for day \( t \) is equal to zero, we calculate a \( t \)-statistic by:
\[
t_{\text{statistics}} = \frac{1}{s/\sqrt{N}} \sum_{i=1}^{N} AR_{it} = \frac{AAR_t}{s/\sqrt{N}}, \quad \text{where} \quad s^2 = \frac{1}{N-1} \sum_{i=1}^{N} (AR_{it} - AAR_t)^2
\]

and \( AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{i,t} \).

To test the null hypothesis (\( H_0: CAAR = 0 \)) that the daily abnormal return over the event window is equal to zero, we calculate the cumulative abnormal returns (CARs) over the event interval \([-5,5]\):
\[
CAR = AR_{t1} + \ldots + AR_{t2} \quad [t_1, t_2] \text{ is the event period.}
\]

We employ the following test statistics for the event period \([t_1, t_2]\):
\[
Z_{\text{car}} = \frac{1}{s(CAR)/\sqrt{N}} \sum_{i=1}^{N} CAR_i = \frac{CAAR}{s(CAR)/\sqrt{N}}
\]

\[
CAAR = \frac{1}{N} \sum_{i=1}^{N} CAR_i
\]

where \( s(CAR) \) is computed cross-sectional on \( CAR_i \).

**Research Design**

Based on the discussion above, we use the following logistic regression to examine the firm characteristics of bidding firms on the probability of a cross-border acquisition:

\[
\text{FOR}_{ij} = \alpha_0 + \alpha_1 \text{MTB}_{ij} + \alpha_2 \text{LEV}_{ij} + \alpha_3 \text{VAL}_{ij} + \alpha_4 \text{ROA}_{ij} + \alpha_5 \text{TOE}_{ij} + u_j,
\]

where
- \( \text{FOR}_{ij} \): probability of a cross-border acquisition by bidding firm \( j \);
- \( \text{MTB}_{ij} \): market value divided by total assets of bidding firm \( j \) reported at the end of the year prior to the takeover;
- \( \text{LEV}_{ij} \): total debt divided by the book value of total assets of bidding firm \( j \) reported at the end of the year prior to the takeover;
- \( \text{VAL}_{ij} \): market value of bidding firm \( j \) 21 days prior to the announcement of the takeover;
- \( \text{ROA}_{ij} \): earnings before interest and taxes (EBIT) divided by total assets of bidding firm \( j \) reported at the end of the year prior to the takeover;
- \( \text{TOE}_{ij} \): percentage of shares held by bidding firm \( j \) prior to the announcement of the takeover;
- \( u_j \): random error term

**EMPIRICAL RESULTS**

**Event-study Results**

Table 2 presents abnormal returns based on the market model for 159 bidding firms under different event windows. The cumulative average abnormal returns (CAAR) for cross-border acquisitions are positive and statistically
The abnormal returns to bidders in foreign acquisitions are at the announcement day 0.77% (p=0.02). The CAAR (-1,1) and the CAAR (-5,5) are 1.63% and 1.89% respectively.

Bidding firms which acquire domestic target firms realize a statistically significant CAAR of 1.66% (p=0.01) over (-5,5). The results in Table 2 show that the CAARs (-1,1) for cross-border acquisitions are significant higher than for domestic acquisitions (p=0.07).

### Table 2: Abnormal returns to bidding firms under different event horizons

This Table reports the Cumulative Average Abnormal Returns (CAAR) for bidding firms during different event windows based on market model returns. The sample includes 159 bidding firms over the period 1987-1996 on the Amsterdam Stock Exchange (AEX); p-values are in parentheses.

<table>
<thead>
<tr>
<th>Event Horizons: CAAR</th>
<th>[0]</th>
<th>[-1, 0, 1]</th>
<th>[-5, 5]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAAR cross-border acquisitions</td>
<td>0.77** (p=0.02)</td>
<td>1.63*** (p=0.01)</td>
<td>1.89*** (p=0.01)</td>
</tr>
<tr>
<td>CAAR domestic acquisitions</td>
<td>0.54 (p=0.21)</td>
<td>0.24 (p=0.60)</td>
<td>1.66 (p=0.01)</td>
</tr>
<tr>
<td>Differences in Means</td>
<td>0.23 (p=0.70)</td>
<td>1.39* (p=0.07)</td>
<td>0.23 (p=0.82)</td>
</tr>
</tbody>
</table>

Note: ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed test)

### Results of Regression Analysis

Logistic regression model estimates are presented in Table 3. The model in column 1 (Logit 1) presents estimates of our full model, which includes MTB, LEV, VAL, ROA and TOE as independent variables. As discussed, this specification allows us to examine the firm characteristics of bidders on the probability of a cross-border acquisition (FOR). We find that the market-to-book ratio (MTB) is statistically significant at the one percent level in all estimated models. Bidding firms with high market-to-book ratios (MTB) tend to acquire foreign target firms. The results are consistent with H1. The variable leverage (LEV) has significant negative coefficients for all models, which is consistent with our predictions (H3). The results suggest that bidding firms with low leverage levels (healthy financial position) will acquire foreign target firms. Consistent with our predictions regarding firm size (VAL), the estimated coefficients are positive and statistically significant at the one percent level in all models (H2). Our results indicate that the probability of foreign acquisitions increases with the size of bidding firms. Our findings are consistent with prior literature.

### Table 3: Regression Estimates of Bidding Firm Characteristics on the Probability of a Foreign Acquisition

This table contains logit regressions of the characteristics of bidding firms on the probability of cross-border acquisitions. The sample includes 159 bidding firms over the period 1987-1996 on the Amsterdam Stock Exchange (AEX). FOR is an indicator variable taking the value of one (zero) for takeovers classified as foreign acquisitions (domestic acquisitions). Market-to-book value (MTB) is the market value over total assets of the bidder, where market value is obtained by multiplying the number of outstanding shares of bidder by its closing market price on the 21st day before the first announcement. Leverage (LEV) is the book value of total debt over the book value of total assets of the bidder. The market value (VAL) is logarithm of market value. Return on assets (ROA) is equal to earnings before interest and taxes divided by the book value of total assets of the bidder. Toehold (TOE) of the bidder is the percentage owned by the bidder prior to the acquisition. All accounting data are obtained from the last annual report prior to the announcement of the acquisition. Return over equity (ROE) is defined as earnings before interest and taxes divided by the common equity of the bidder.

The logistic regression model has the following form:

\[
\text{FOR}_t = \alpha_0 + \alpha_1 \text{MTB}_t + \alpha_2 \text{LEV}_t + \alpha_3 \text{VAL}_t + \alpha_4 \text{ROA}_t + \alpha_5 \text{TOE}_t + u_t
\]

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>Predicted Sign</th>
<th>Logit 1</th>
<th>Logit 2</th>
<th>Logit 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>+/-</td>
<td>-1.825</td>
<td>-2.147**</td>
<td>-2.181**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(p=0.08)</td>
<td>(p=0.03)</td>
<td>(p=0.03)</td>
</tr>
<tr>
<td>Market-to-Book (MTB)</td>
<td>+</td>
<td>0.650***</td>
<td>0.497***</td>
<td>0.612***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(p=0.00)</td>
<td>(p=0.00)</td>
<td>(p=0.01)</td>
</tr>
<tr>
<td>Leverage (LEV)</td>
<td>-</td>
<td>-0.029**</td>
<td>-0.022</td>
<td>-0.024**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(p=0.03)</td>
<td>(p=0.06)</td>
<td>(p=0.05)</td>
</tr>
<tr>
<td>Size (VAL)</td>
<td>+</td>
<td>0.825***</td>
<td>0.696***</td>
<td>0.784***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(p=0.00)</td>
<td>(p=0.01)</td>
<td>(p=0.01)</td>
</tr>
<tr>
<td>Return on Assets (ROA)</td>
<td>+</td>
<td>-0.035</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(p=0.40)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Toehold (TOE)</td>
<td>+/-</td>
<td>-0.055***</td>
<td>-</td>
<td>-0.054***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(p=0.01)</td>
<td>-</td>
<td>(p=0.01)</td>
</tr>
</tbody>
</table>
The coefficient of toehold (TOE) is negative and statistically significant at the one percent level. The result suggests that the probability of a foreign acquisition decreases when the bidder has a large stake in the target firm.

Of the remaining variables, return on assets (ROA) and return on equity (ROE) have insignificant negative coefficients.

CONCLUSIONS

In this paper, we present the impact of firm characteristics of bidding firms on the probability of cross-border acquisitions. We find that shareholders of bidding firms have statistically significant positive abnormal returns surrounding takeover announcements of foreign target firms. We found bidder returns of 1.89% over the event-window [-5, +5]. Our results suggest that foreign acquisitions generate significant positive abnormal returns to bidding firms. The cumulative average abnormal returns to bidding firms over the event window around the announcement day [-1, 0, 1] is significant higher for foreign acquisitions in comparison with domestic acquisitions. The results are significant at the 10 percent level.

We find that the likelihood of cross-border acquisitions increases with the size of bidding firms and with the performance of bidding firms. These results indicate that large and high performing bidding firms choose foreign targets firms over domestic target firms. Finally, we find that the likelihood of cross-border acquisitions decreases with the leverage of bidding firms, which indicate that only bidding firms with a solid financial position are engaged in foreign acquisitions. Our results support the theory that foreign direct investments (FDI) are beneficial to bidding firms.

REFERENCES


