

ABNORMAL RETURNS AND COMBINED VALUES

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ABSTRACT

This study features the impact of takeovers on both target and bidding firms traded on the Stock Exchange of Thailand (SET). The study investigates a long-window abnormal return, or during a period of twelve months before and after the announcements using several metrics. Their long-term bid period returns were measured by cumulative, buy-and-hold average abnormal returns estimated from the market and market-adjusted models. The three parametric statistic tests: standardized-residual test, standardized cross-sectional test and conventional *t*-tests were used for significance tests of the means. The results add to the literature on emerging markets and provide a further comparison with developed stock markets. They are consistent when compared within this study, and most past studies using the limited range of research methods, suggesting that a Thai takeover results in significant and positive combined values for the target and bidding firms' shareholders.

Key words: takeover, abnormal return, combined values, Thailand

JEL Codes: G14, G34

I. INTRODUCTION

Mergers and acquisitions do not guarantee success for all business combinations. Past studies show that successful firms that combine businesses can benefit from economies of scale or economies of scope, but diversification for other reasons tends to be less successful (e.g., Besanko,

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Dranove, Shanley & Schaefer, 2004; Cole, Fatemi & Vu, 2006; Denis & McConnell, 2003; Shleifer & Vishny, 1989). Forms of the event study methodology has been the predominant method used to measure stock price responses to merger or takeover announcements, and most studies suggest that takeovers create shareholder wealth (e.g., Akbulut & Matsusaka, 2003; Beitel, Schiereck & Wahrenburg, 2002; Bruner, 2002; Campa & Hernando, 2004; Jensen, 2006; Kuipers, Miller & Patel, 2002).

However, surveys reveal that studies show that target firm's shareholder returns are on average significantly positive; meanwhile, the evidence on bidding firms is far less conclusive (e.g., Bruner, 2002; Campa & Hernando, 2004; Datta, Pinches & Narayanan, 1992). Jensen and Ruback (1983) and some others, for example, Sudarsanam and Ashraf (2003) and Martynova and Renneboog (2007) show that the results are divided between those studies that report negative and positive or zero returns to bidding firm's shareholders.

Consequently, even though most of the studies report positive combined abnormal returns, some argue that takeovers have negative effects; see, for example, Aktas, Bodt, and Declerck (2002) find negative combined returns of event firms, which are similar to part of results reported by Akbulut and Matsusaka (2003), Firth (1980) and Varaiya (1985). Therefore, the results are mixed, though they suggest that anticipated wealth creation can be viewed as the likely rationale behind merger and acquisition decisions.

Thus, this research was undertaken to explore this issue in a Thai context: whether or not takeovers result in positive or negative effects on target and bidding firms' shareholders and subsequently their combined values. The study primarily based on a sample of successful tender offers. The analysis emphasized abnormal performance measurement by using monthly stock price data. The market and market-adjusted expected return models were used for the abnormal return estimations for the long-term (bid period). The cumulative abnormal return (CAR) and buy-and-hold abnormal return (BHAR) methods were also used for the measurement of the returns to the both firms. This study provides evidence that the takeovers result in substantially positive combined values for the target and bidding firms' shareholders. This study enriches the financial literature on emerging markets in terms of greatly enhancing variety results and provides a further comparison with developed stock markets.

II. REVIEW OF PRIOR RESEARCH

Prior studies show that the stock prices of target firm significantly increase at and around the announcement of a takeover. These studies include studies that examine the takeover activities occurring prior to 1980 and during the 1980s and 1990s (e.g., Mandelker, 1974; Ellert, 1976; Eckbo, 1983; Bradley, Desai & Kim, 1988; Frank, Harris, & Titman, 1991; Schwert, 1996; and more recent studies (e.g., Bhagat, Dong, Hirshleifer & Noah, 2005; Martijn, Vinay & Kose, 2009). Similar evidence is suggested by surveys, such as Datta, Pinches & Narayanan, 1992; Jarrell, Brickley & Netter, 1988 and Jensen & Ruback, 1983; and more recent surveys, such as Bruner, 2002; Burkart & Panunzi, 2006; Campa & Hernando, 2004 and Martynova & Renneboog, 2007.

Work on non-USA and European stock markets gives further support; see, for example, King and Padalko (2005), in a Canadian study; Da Silva Rosa, Izan, Steinbeck, and Walter (2000), in an Australian study; Kang, Shivdasani and Yamada (2000), in a Japanese study, all report that the target firm shareholders benefit significantly from takeover announcements.

Meanwhile, the evidence on bidding firm's shareholder returns is inconclusive. Datta, Pinches, and Narayanan (1992) cite some contrary evidence to that reported in Jensen and Ruback (1983) and Jarrell, Brickley, and Netter (1988). In particular, they find that the bidding firm's shareholders do not gain at all; whether successful or not.

Bruner (2002) summarizes the findings of 44 studies and 13 of 20 studies report significantly negative returns varying between -1 and -3%. Similarly, Campa and Hernando (2004) summarize the findings of 17 studies, 10 of these studies report negative abnormal returns which vary between less than 1% and -5%, and in most cases are significantly different from zero. Seven more studies report zero or positive abnormal returns ranging from zero to 7%. Additional support, but different views, from some other studies; see, for example, Brown and Da Silva Rosa (1998) report that acquisitions increase bidding firm shareholders' equity value, which are similar results reported in studies (e.g., Beitel, Schiereck, & Wahrenburg, 2002; Eckbo & Thorburn, 2000; Floreani & Rigamonti, 2001; Goergen & Renneboog, 2004; Ghosh, 2001; Ghosh, 2002; Herman & Lowenstein, 1988; Parrino & Harris, 1999).

Even though there is more consensus about the net shareholder wealth effect of takeovers, some other studies report different results. Most studies report positive combined returns, but relatively small

ranging from less than 1 to 5 % ; e.g., Campa & Hernando, 2004; Fan & Goyal, 2006; Goergen & Renneboog, 2002; Holmen & Knopf 2004; Houston, James, & Ryngaert, 2001; Kuipers, Miller, & Patel, 2002; Moeller & Schlingemann, 2005; Mulherin & Boone, 2000; except for studies by Bradley, Desai, and Kim (1988), Healy, Palepu, and Ruback (1992), Lang, Stulz, and Walkling (1989), and Smith and Kim (1994) report positive combined returns, ranging from 7.43% to 11.30%. Meanwhile; see, for example, Varaiya (1985) finds negative combined returns of -3.90%; Aktas, Bodt, and Declerck (2002) report both positive and negative combined returns, varying from -0.61% to +5.89%, which are similar to those reported by Akbulut and Matsusaka (2003).

While most of the previous studies have focussed on US and European events, only a small number of merger studies have examined developing or emerging stock markets; e.g., Estrada, Kritzman & Page, 2004; Fernandes, 2005. Moreover, there have been a very small number of studies investigating Thai mergers. Lins and Servaes (2001) assess the value of corporate diversification in seven emerging markets, including the Thai stock market, and find that diversified firms experience a discount of approximately 7% when compared with single-segment firms. Claessens, Djankov, Fan, and Lang (1998) suggest that whilst firms in more developed stock markets are successful in vertical diversification; in less developed stock markets, firms in Indonesia, Korea, Taiwan and Thailand appear to suffer significantly negative effects from vertical integration, but gain significantly benefits from complementary expansion. Fauver, Houston, and Naranjo (2002) report that in high-income countries, there is a significant diversification discount, but in lower-income and segmented countries, there is either no diversification discount or diversification premium. Khanna and Palepu (2000) suggest that diversification is more valuable in emerging markets than in more developed economies. The evidence is therefore inconclusive.

Obviously, most studies have focused on stock returns over short time-periods (a few days or a few months) around the takeover announcements, including Thai merger studies. In addition, they have been predominantly analyzing a target or bidding firm's performance rather than examining total takeover effects, or combined values of the event firms. These Thai studies used daily stock price data, examined short-window abnormal returns and applied only the market model plus a limited range of statistical tests. We know that event study results are sensitive to the metrics used. Thus, a more comprehensive study of merger and acquisition performance on the SET is timely and justified.

A majority motivation for this study is to examine whether or not different samples, markets and methodologies result in different

outcomes. This is the first comprehensive study of Thai mergers, focusing both target and bidding firms. This study extends the literature and permits an international comparison of merger and acquisition effects on the Thai stock market.

III. DATA

This study uses stock price data rather than accounting data for the takeover performance measurement. There are significant sources of data set out as follows:

- (1) The list of total companies listed on the SET at any point of time during the period 1991-2003, the list of delisted companies and the list of companies traded under the rehabilitation sector or "REHABCO" were obtained from the SET.
- (2) All tender-offer statistics between August 1992 and October 2002 were obtained from the Securities and Exchange Commission, Thailand (SEC).
- (3) The Thomson Primark Datastream database was used to provide stock prices for the sample firms.

IV. RESEARCH METHODOLOGY

Past studies show evidence that market reaction to news is not always completed over short-time periods, such as Loughran & Vijh, 1997 and Rosen, 2006. Similarly, several more studies document abnormal returns spread over the long-term post-event period of time, for example, studies by Baker & Limmack, 2001; Fama, 1998; Hou, Olsson & Robinson, 2000; Kothari, 2001; Kothari & Warner, 1997; Schwert, 2002.

However, there have been studies concentrate on merger and acquisition activities on developed stock markets, for example, Brown and Warner (1980 and 1985), Campbell and Wasley (1993), Dumontier and Petitt (2002), Dyckman, Philbrick, Stephan, and Ricks (1984); Goergen and Renneboog (2002), among others. Most of them have examined abnormal returns measured on a particular day or cumulated over some months. Yet, there are an increased number of recent studies that have focused more on long-term performance examination. They emphasize more on bidding firms rather than target firms, but very less on combined values of the event firms. By comparison, with a limitation number of studies examining takeover effects either on developing markets or the Thai market, nearly all of them have given priority to short-term performance

investigation, used daily stock price data and applied the limited ranges of research methods and statistical tests.

An interest of this research is examining long-term bid-period abnormal return behaviour of target and bidding firms, responded to takeover announcements on the SET. This study uses monthly stock price data to investigate the effects around the takeover announcements, or during a period (-12,+12) months before and after the takeovers. Specifically, in addition to including sample data by covering a longer period from 1992 to 2002, this study investigates target and bidding firms and their combined values using more research methodologies. For example, I apply two expected return models: the market and market-adjusted models, and three significance statistic tests: standardized-residual test, standardized cross-sectional test and conventional *t*-tests. This contributes to the understanding more of Thai takeover effects on target and bidding firms, and enriches financial literature in terms of greatly enhancing the existing literature given the limited number of prior studies involved and a variety of their results.

This study is largely based on a sample of successful tender offers. The analysis emphasizes abnormal performance measurement by using monthly stock price data. The firm's stock price reaction to the takeover announcement was estimated as the rate of abnormal return to the shareholders of the target and bidding firms. The abnormal return was defined as the difference between the realized return observed from the market and the benchmark return over the period around the takeover announcements. Also, it was defined "at the announcement of takeovers" or "around the takeover announcements" as the event-window of the examination.

The event period was the bid period or (-12,0,+12) months, month '0' was defined as the event month, and the event month was defined as the submission month of the tender offer by the bidder to the SEC, or the month that the proposal was filed at the SEC. The analysis is based on the tender offer statistics obtained from the SEC between 1992 and 2002. The sample firms were classified according to whether they were involved as a target or bidder.

In the time selected, the takeovers on the SET involved 151 tender offers (151 targets and 74 bidders). From this database, a sample was set up according to the following criteria:

1. A tender offer was classified as being successful if the bidder increased its holding of the target shares or purchased at least some² of the outstanding target shares that were tendered for. Thai security legislation defines a proportion above 25% of the target shares' holdings as a 'strategic shareholder' and the bidder is required to tender an offer for the total remaining outstanding shares of the target.
2. Any tender offer was excluded from the sample when it occurred with the purpose of a de-listing³. Some cases were also deleted when the tender offer was cancelled later or the target firm was in the process of delisting.
3. The survivorship period of time required in this study is the period over (-48,+16) months, due to the limitation of available stock price data.

These selection criteria reduced the initial sample from 151 tender offers to 52 tender offers (52 target firms) and 28 tender offers (42 bidding firms). However, to measure the combined values of target and bidding firms, the further selection criteria resulted in two investigated alternatives for target and bidding firms: 5 targets vs. 5 bidders and 4 targets vs. 4 consortia (6 single bidding firms).

A. Measurement of Abnormal Returns

To examine the effect of the event on each stock, i , control is made for the normal relation between the return on stock i during month t , and the return on the market index R_m .

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad \dots\dots\dots(1)$$

where R_{it} is the return of stocks, R_{mt} is the return of market index, α_i is the intercept term, β_i is the systematic risk of stocks and ε_{it} is the error term.

The market model was selected as an expected return model and the OLS (ordinary least squares) regression was used in regression of the

² The control of a firm can increase continuously from none for those who own no shares to complete for those who own 100% of the target's shares or voting rights operations (see more in Bradley, Desai, & Kim, 1988, p. 5; also see Dodd & Ruback, 1977, p.352). In this study, the bidders hold the target shares approximately 28.19% before they tender an offer and/or offers, then the purchased target shares of about 28.99% finally result in their target share holding of 57.18%, on average.

³ There are about 22.52% of the total tender offers are engaged with delisted purposes and approximately 60.78 % of the total delisted companies are caused by mandatory delisting.

stock return over three years of the estimation period against the return on the valued weighted SET index for the corresponding calendar months. Month 13 (or 0) was determined as the event month and calculated 25 abnormal returns on each stock over the period around the takeover announcements, from month 1 (-12) through to month 25 (+12). This interval is the event window for the bid period investigation of this study. The impact of the event on stock returns was examined through a number of stocks that were affected by the takeover announcements at the event time. The abnormal returns (ARs) were averaged as

$$AAR_t = 1/n \sum_{i=1}^n \varepsilon_{it} \dots\dots\dots(2)$$

where *n* is the number of stocks.

The accumulated effect of the event was examined using the CAAR measure. The values of the AARs were continuously cumulated for every month from *T*₁ (month1 or -12) to *T*₂ (month 25 or +12) as

$$CAAR = \sum_{t=T_1}^{T_2} AAR_t \dots\dots\dots(3)$$

The BHAR approach was also used. A stock’s BHAR was defined as the product of one plus each month’s abnormal return, minus one. To obtain a holding-period buy-and-hold abnormal return (BHAR_{*iT*}), the abnormal returns were calculated as

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \dots\dots\dots(4)$$

$$BHAR_{iT} = \prod_{t=0}^{T-1} [1 + AR_{it}] - 1 \dots\dots\dots(5)$$

where *t*=0 is the event month or the beginning period and *T*-1 is the period of investment (in months).

Abnormal performance (BHAR_{*pT*}) was defined as the cross-sectional average of the buy-and-hold abnormal return of the number of stocks (*n*). That is the abnormal return (BHAR_{*iT*}) was averaged as

$$BHAR_{pT} = 1/n \sum_{i=1}^n BHAR_{iT} \dots\dots\dots(6)$$

The market-adjusted model was another expected return model used for this study as

$$R_{it} = \beta_i R_{mt} + \varepsilon_{it} \dots\dots\dots(7)$$

where R_{it} is the return of stocks, R_{mt} is the return of market index, β_i is the systematic risk of stocks and ε_{it} is the error term.

B. Measurement of Combined Values

For the combined value measurement of target and bidding firms, the methodologies used were the same as those used in several studies such as Campa & Hernandon, 2004; Cybo-Ottone & Murgia, 2000 and Goergen & Renneboog, 2002. This is called the weighted average abnormal return method. However, there have been a number of studies applying similar methodology, valued weighted, such as Berkovitch & Narayanan, 1993; Bradley, Desai & Kim, 1988; Gondhalekar & Bhagwat, 2000 and Gupta, LeCompte & Misra, 1997. According to Cybo-Ottone and Murgia’s (2000) suggestion stating that looking only at the target and bidder separately would give a distorted interpretation of the market reaction to the announcement, I evaluated the target and bidder’s combined values resulted from the takeover announcements over the bid-period by using the following equation:

$$(AR_{t_i} \times MV_{t_i} + AR_{b_i} \times MV_{b_i}) / (MV_{t_i} + MV_{b_i}) \dots\dots\dots(8)$$

where AR_{t_i} is the abnormal return of target, AR_{b_i} is the abnormal return of bidder, MV_{t_i} is the market capitalization at the end of the month before the event month for target and MV_{b_i} is the market capitalization at the end of the month before the event month for bidder

C. Significance Tests of Abnormal Returns

To test the null hypothesis that the mean cumulative or BHAR is equal to zero for a sample of n firms; I employed three parametric test statistics.

(1) Standardized-residual test

$$t = \frac{\sum_{i=1}^N SR_{iE}}{\sqrt{\sum_{i=1}^N (T_{i-2}) / (T_{i-4})}} \dots\dots\dots(9)$$

or
$$t = \frac{\sum_{i=1}^N SR_{iE}}{\sqrt{N}} \dots\dots\dots(10)$$

where SR_{iE} is the standardized residual, T_i is the number of days (months) in security i 's estimation period and N is the number of firms in the sample.

(2) Standardized cross-sectional test

$$t = \frac{1}{N} \sum_{i=1}^N SR_{iE} / \sqrt{\frac{1}{N(N-1)} \sum_{i=1}^N (SR_{iE} - \sum_{i=1}^N SR_{iE} / N)^2} \dots\dots\dots(11)$$

(3) Conventional t -tests

$$t_{CAR} = \overline{CAR}_{iT} / (\sigma(CAR_{iT}) / \sqrt{n}) \dots\dots\dots(12)$$

$$t_{BHAR} = \overline{BHAR}_{iT} / (\sigma(BHAR_{iT}) / \sqrt{n}) \dots\dots\dots(13)$$

where \overline{CAR}_{iT} and \overline{BHAR}_{iT} are the sample averages and $\sigma(CAR_{iT})$ and $\sigma(BHAR_{iT})$ are the cross-sectional sample standard deviations of abnormal returns for the sample of n firms.

V. RESULTS

The market and market-adjusted models were used for the estimation of abnormal returns for the target and bidding firms' shareholders. The CAR and BHAR methods were applied for the return measurements. The results are presented and explained in the following section in terms of the performances of the average abnormal returns of target and bidding firms, and combined values for the event firms' shareholders. The main issues are the size and signs of these abnormal returns and whether or not they are significantly different from zero.

A. Combined Values

To measure the combined values of target and bidding firms, this study applied the weighted average abnormal return method which had been used in a number of studies, as previously discussed. There are two investigated alternatives for target and bidding firms: 5 targets vs. 5 bidders and 4 targets vs. 4 consortia (6 single bidding firms). As the pairs of event firms, 5 targets and 5 correspondent bidders were investigated and the results show that the cumulative average combined values (CACVs) of the target and bidding firms are negative at -1.29%, when estimated from the market model and are positive at 33.52%, as estimated

from the market-adjusted model. The other investigated alternative, 4 targets and 4 correspondent consortia bidders were examined and the results show that the CACVs of the target and bidding firms are positive at 16.37%, as estimated from the market model and 52.15%, when estimated from the market-adjusted model. The results are consistent in terms of return direction, but are not for the magnitude.

However, even though the results from these two investigated alternatives are partly supportive, each result is consistent with some past studies reporting positive and negative combined values. Nevertheless, the findings of this study show that the combined values of target and bidding firms are positive at 16.12%, when estimated from the first alternative investigation and 34.26%, as estimated from the second one, or approximately 25.19% on average. In this view, the results coincide with those of most previous studies suggesting positive combined values of target and bidding firms, even though they are of different of magnitude.

For further study, these two alternatives of the target and bidding firms were investigated for results post the announcement month by applying both the cumulative abnormal return (CAR) and buy-and-hold abnormal return (BHAR) approaches. At the same time, three parametric statistic tests: standardized-residual, standardized cross-sectional, and conventional *t*-tests, were employed to test the significance of the combined values of target and bidding firms. The results are summarized and presented in Table 1.

The pairs of event firms or 5 target firms and 5 correspondent bidding firms were investigated, and the results estimated from the market model show that the CACVs over the period (-12+12) of the target and bidding firms are negative at -16.30%, and the ABHCVs over the same time period are negative at -20%. At the same time, the ATSRs and AASRs are also negative at -13.20% and -2.60% respectively. For further comparison and analysis, the results estimated from the market-adjusted model shows that the CACVs over the period (-12+12) of the target and bidding firms are significant and positive at 42.10%, and the ABHCVs over the same time period are insignificantly positive at 31.70%. Accordingly, the ATSRs and AASRs are positive at 73.70% and 14.70% consecutively. Therefore, the findings are consistent with each other for each model, even when each of them has opposite return directions.

Alternatively, 4 target firms and 4 correspondent consortia (6 single bidding firms) were examined, and the findings estimated from the market model show that the CACVs over the period (-12,+12) of the target and bidding firms are positive at 0.70%, and the ABHCVs over the same time period are positive at 6.20%. Meanwhile, the ATSRs and AASRs are

also positive at 153.90% and 35.70% respectively. For further comparison and analysis, the findings estimated from the market-adjusted model show that the CACVs over the period (-12+12) of the target and bidding firms are significantly positive at 68%, and the ABHCVs over the same time period are significant and positive at 82.10%. Supportively, the ATSRs and AASRs are positive at 229.60% and 41.40% consecutively, but are statistically insignificant. The findings are consistent in terms of return direction.

Obviously, the two investigated alternatives give some consistency and it can be concluded that the average combined values of the target and bidding firms are positive varying from 42% to 68% for the CACVs and 82% for the ABHCVs. Consistently, most past studies report that takeovers result in positive combined returns. Therefore, the results of this study are confirmed particularly in terms of return direction, even though they are of a different magnitude.

VI. CONCLUSION

This study gives light to many results which are robust. The findings are consistent with each other, particularly in terms of the return direction, when comparisons were made between the CAR and BHAR methods, and also between the market and market-adjusted models. The results are internally consistent when compared within this study itself, and also with most of the findings of previous studies of the developed stock markets and the limited existing studies of emerging stock markets, with respect to the different samples, methods and time periods of the investigations. The combined values of the event firms are positive at 16.12%, when estimated from the first alternative investigation (5 target firms and 5 correspondent bidding firms) and 34.26%, as estimated from the second alternative (4 target firms and 4 correspondent consortia (6 single bidding firms)), or approximately 25% on average.

In further confirmation, the results of the investigations for the combined values of the target and bidding firms after the announcement month show that the cumulative average combined values (CACVs) and average buy-and-hold combined values (ABHCVs) are significantly positive varying from 42% to 68% and 82% respectively. Consistently, the results of this study are seemingly robust especially in the sense of the revealed return direction. Thus, they are consistent with those reported in most previous studies suggesting that takeovers generate positive combined values.

This research contributes to the understanding more of the impact of takeover effects on both the target and bidding firms traded on the SET. The main findings of this study suggest that a Thai takeover announcement results in substantial abnormal returns to the event firms' shareholders. The average combined values are significant and positive indicating takeovers create values. The results add to the literature on emerging markets in terms of enhancing the existing literature, given the limited number of prior studies involved and limited ways of applying research methodologies, and international comparisons of takeover effects on the Thai stock market.

Table 1 Combined Value of Target and Bidding Firms

Market Model				Market-Adjusted Model			
CACVs	ABHCVs	ATSRs	AASRs	CACVs	ABHCVs	ATSRs	AASRs
<u>5 Targets vs. 5 Bidders</u>							
-0.163	-0.200	-0.132	-0.026	0.421	0.317	0.737	0.147
(-0.85)	(-1.27)	(-0.06)	(-0.45)	(4.50)*	(2.69)	(0.32)	(0.62)
<u>4 Targets vs. 4 Consortia (6 single bidding firms)</u>							
0.007	0.062	1.539	0.357	0.680	0.821	2.296	0.414
(0.02)	(0.19)	(0.72)	(1.01)	(8.59)**	(9.72)**	(0.94)	(0.60)
*significant at 5% level				**significant at 1% level			

This table demonstrates abnormal returns for target and bidding firms for tender offers occurring from 1992-2002. The expected returns for the target and bidding firms' shareholders for the bid period (-12,+12) were measured from the market and market-adjusted models. The monthly abnormal returns for the target and bidding firms' shareholders from 12 months before the event month until 12 months after the event month were estimated then, the combined values for each month of the target and bidding firms were obtained using the following equation: $(AR_t \times MV_t + AR_b \times MV_b) / (MV_t + MV_b)$; AR_t and AR_b are the abnormal returns to target and bidding firms; MV_t and MV_b are the market

capitalizations at the end of the month before the event month of target and bidding firms. The combined values of the target and bidding firms were cumulated from the first month until the last month of the investigation period and averaged or calculated by means of the cumulative abnormal return (CAR) method then, averaged to obtain the cumulative average combined values (CACVs). At the same time, the buy-and-hold abnormal return (BHAR) method was also applied by continuously compounding the combined values from the first month until the last month of the investigation period then, averaging them to be the average buy-and-hold combined values (ABHCVs) of the target and bidding firms. Also, the total or the sum of standardized abnormal returns (residuals) (TSRs), and average event-period standardized abnormal returns (residuals) (ASRs) for the target and bidding firms' shareholders were calculated. Then, the means of the TSRs (ATSRs and ASRs (AASRs) were estimated. To compare and strengthen the results about the combined values of target and bidding firms and in addition to investigating the pairs of event firms or 5 target firms and 5 correspondent bidding firms, 4 target firms and 4 correspondent consortia (6 single bidding firms) were also examined and the findings are presented in this table. In this case, for each takeover activity, both target and bidding firms were listed companies when the takeover was taking place. Three parametric statistic tests: the standardized-residual, standardized cross-sectional, and conventional *t*-tests, were applied to test the significance of the average combined values for the event firms' shareholders. The *t*-statistics were calculated by means of the first two tests with the TSRs and the ASRs respectively, and the last test was applied with the average combined values from the CAR and BHAR methods. The *t*-statistics are the sum of the standardized residuals divided by (approximately) the square root of the number of sample firms, and the average event-period standardized residual divided by its contemporaneous cross-sectional standard error respectively. The standardized residual equals the event-period residual divided by the standard deviation of the estimation-period residuals, adjusted to reflect the forecast error. The conventional *t*-test statistic is the average combined value divided by its cross-sectional standard error. All three parametric significance test formulas are shown as follows: $t = \sum_{i=1}^N SR_{iE} / \sqrt{N}$; $t = 1/N \sum_{i=1}^N SR_{iE} / \sqrt{1/N(N-1) \sum_{i=1}^N (SR_{iE} - \sum_{i=1}^N SR_{iE} / N)^2}$; and $t_{CAR} = \overline{CACV}_{IT} / (\sigma(CACV_{IT}) / \sqrt{n})$, $t_{BHAR} = \overline{ABHCV}_{IT} / (\sigma(ABHCV_{IT}) / \sqrt{n})$. The CACV and ABHCV in the formulas are the combined values from the CAR and BHAR methods respectively. The sample sizes (*N*) for each alternative are 5 and 4 respectively, 36 months and 25 months were selected for the estimation-

period and event-window consecutively. The test statistics are provided in the parentheses.

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