Information Asymmetry in the Takeover Market

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Abstract

We examine 1,612 acquisitions of *publicly listed* targets over the period of 1985 – 2006 and test directly how information asymmetry affects the bidding premiums and the announcement returns of the acquirer and the target. Based on several standard proxies for information asymmetry of target firms, we find that the bidding premium is *positively* correlated with these proxies. We provide explanation for this seemingly counter-intuitive result which is more apparent than real. The information asymmetry proxies also correlate positively with the announcement cumulative abnormal returns (CARs) of the acquirer over the five-day event window. More importantly, notwithstanding the general findings that acquirers earn an average of zero or mildly negative CARs during the takeover announcement period, we observe that the acquirer CARs are *positive* for the target group at the highest percentile (i.e., highest opacity) in our asymmetry grouping. Apparently, the market rewards acquirers who take in more opaque targets. We also find similar positive relationship of information asymmetry and the announcement returns for target firms. We argue that when the target is more opaque to the market, the takeover announcement has stronger certifying power for the market to re-evaluate the takeover target more favorably.

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1. Introduction

Takeover studies are voluminous but those related to information asymmetry is minimal. This is especially so for empirical studies. How information asymmetry affects the bid premium, the payment method, and the share prices of the bidding firm as well as the target firm upon the takeover announcement are interesting and important questions but studies are practically non-existent. This is surprising, considered asymmetric information being a crucial concept in finance.

For the few empirical papers that we are aware of, they study the impacts of information asymmetry in bits and pieces. For instance, Amihud, Lev, and Travlos (1990) find that acquiring firms with larger managerial ownership fractions are more likely to use cash payments in corporate acquisitions. They argue that the result can be interpreted as due to information asymmetry between corporate insiders and uninformed outside investors. Yook, Gangopadhyay, and McCabe (1999) also find that such information asymmetry can explain the choice of payment method. Baradwaj and Shivdasani (2003) study 115 cash tender offers between 1990 and 1996 and find that acquisitions entirely financed by banks are associated with large and significantly positive acquirer announcement returns. Announcement returns are also positively related to the fraction of the acquisition value financed by bank debt. They argue that bank financing performs an important certifying and monitoring role for acquirers in tender offers. An exception is a recent study by Moeller, Schlingemann, and Stulz (forthcoming) that is more direct in examining the information asymmetry of the *acquirers*. They find that acquiring firms with greater information asymmetry (uncertain about the future growth prospect) will face more negative announcement return if they use equities to acquire public targets. Yet, such negative relationship does not exist if they use either cash to acquire or they acquire non-public targets.

A couple of studies look at information asymmetry of the *targets*. Focarelli and Pozzolo (2001) find that cross-border mergers are less common in the banking industry than in other sectors during the nineties. They argue that information asymmetries in banking relationships make a domestic bank difficult to judge the value of a foreign bank. An interesting work by Officer, Poulsen, and Stegemoller (2006) looks at information asymmetry of *privately held* target firms. They aim to explain why stock purchase brings higher announcement returns than cash purchase for private targets, which is the exact opposite for public targets. They use the R&D expenditure and the relative amount of intangible assets to proxy for information asymmetry. They find that the announcement return of the acquirer is significantly higher if acquirers use stocks to acquire targets of high R&D expenditures or having lots of intangible and hard-to-value assets. They hence argue that to acquire targets of extreme information asymmetry such as privately held firms, stock is the optimal payment method as stock is a contingent contract which could protect certain downside risk to the shareholders of the acquirer in case the opaque target is a lemon.

Notice that these papers rarely measure information asymmetry systematically and test its impacts

directly. To fill up the void, we examine, in this paper, 1,612 acquisitions of *publicly listed* targets over the period of 1985 – 2006 and test directly how information asymmetry affects the bidding premiums and the announcement returns of the acquirer and the target.

Based on several standard proxies for information asymmetry of target firms, we find an apparently surprisingly result that the bidding premium is *positively* correlated with these proxies, which seems to suggest that the bidder pays a higher acquisition price for a target of higher opacity. We argue that this seemingly counter-intuitive result is more apparent than real. In fact, another set of our results indicate that the information asymmetry proxies also correlate positively with the announcement cumulative abnormal returns (CARs) of the acquirer over the five-day event window. More importantly, notwithstanding the general findings that acquirers earn an average of zero or mildly negative CARs during the takeover announcement period, we observe that the acquirer CARs are *positive* for the target group at the highest percentile (i.e., highest opacity) in our asymmetry grouping. Apparently, the market rewards acquirers who take in more opaque targets. We also find similar positive relationship of information asymmetry and the announcement returns of the target firm. We argue that when the target is more opaque to the market, the takeover announcement gives stronger certifying power for the market to re-evaluate the takeover target more favorably, resulting in such positive relationship.

Other than being a direct test on the impact of information asymmetry, our paper is also a general study as publicly listed target firms provide a rich spectrum of information asymmetry. To the extent that unlisted firms are extreme cases of information asymmetry, our study enriches and generalizing existing studies on private targets. The analysis proceeds as follows. We develop our testing hypotheses in Section 1. The construction of proxies for information asymmetry is discussed in Section 2. Data and methodology to be used for our tests are discussed in Section 3. Section 4 provides basic empirical results and Section 5 covers some robust tests. Section 6 concludes the study.

1. Hypothesis Development

1.1 Information and Bid Premium

How much to pay for the target is the most important issue in takeover. Too low a bid price may cause the resistance of the target, and thereby the failure of the takeover and the loss of a profitable opportunity (Jennings and Mazzeo, 1993). Too high a bid price may reduce the gains of the bidder, result in poor post-takeover performance of the bidder (Lubatkin, 1983; Varaiya and Ferris, 1987), and may even cause bankruptcy of the bidder. Considering the importance of bid price in takeovers, prior literature has examined many factors that may affect the bid premium. However, little empirical research considers information asymmetry as a factor.

Obviously, the bidder faces an information disadvantage about the value of the target in takeovers.

Prior literatures have documented in various context that such information disadvantage has a significant effect on asset pricing. For example, there are evidences showing that information uncertainty plays a significant role on the expected asset underpricing in a firm's IPO process (Beatty and Ritter, 1986; Rock, 1986). In the placement of private equity, Hertzel and Smith (1993) document substantial price discounts and find evidence that discounts reflect information costs borne by private investors. Botosan (1997), Botosan and Plumlee (2002, 2005), Easley and O'hara (2004), among others, found that the cost of capital for a firm is reduced if the firm's information quality is improved.

In the takeover context, information asymmetry may seriously affect the acquirer's bidding strategy. Theoretically, Samuelson (1984) argues that, in face of asymmetric information, the uninformed buyer can achieve his maximal attainable expected profit when he has the opportunity to make a first-and-final offer which the seller can reject or accept. Empirically, Koeplin, Sarin and Shapiro(1996) document that private firms are acquired at an average 20-30% discount relative to similar public companies when using earnings multiples as the basis for valuing the transactions. Officer (2007) also document an average 15% to 30% acquisition discounts for stand-alone private firms and subsidiaries of other firms (unlisted targets) relative to acquisition multiples for comparable publicly traded targets. The market discount may partly be the risk compensation to the bidder for adversely selecting a potential "lemon" target under asymmetric information.

However, such discount may also be due to liquidity reason. From the target point of view, private owners want to cash out for liquidity reasons (Fuller, Netter and Stegemoller, 2002; Faccio and Masulis, 2005; Poulsen and Stegemoller, 2006) and may even be willing to accept a price discount upon selling (Officer, 2006). From the buyer's point of view, she is using liquid cash and/or her tradable shares to acquire nontraded assets of the private firms/subsidiaries. As such, the discount can be liquidity-driven rather than risk-driven (due to asymmetric information). Indeed, Officer (2007) finds supporting evidence for the liquidity argument. Interestingly, he suspects that information asymmetry effects actually may constitute a large fraction of the acquisition discount. He shows that acquisition discounts for subsidiaries appear to be greater when there is more information asymmetry about the selling parent although the effect is statistically and economically marginal. He attributes this marginal effect to the poor proxies of information asymmetry (the relative size of the target to the bidder and metrics for growth opportunities of the target firm), which are quite broad and imprecise.

Since our sample "restricts" to publicly listed targets, liquidity effect should be minimal and if information asymmetry is really important in the decision of the bidding price, we would expect to observe more conservative bidding price under a target with higher information asymmetry. However, we have to note that the bid price is not the same as the bid premium. To facilitate the discussion, let's assume under perfect information, the "fair" value of a publicly listed target be F that includes the

potential synergy to be realized. Under asymmetric information, the bidder discounts the target by D amount so that the offer price is reduced to (F – D). Assume further that the "initial" target stock price prior to the offer be S. The bid premium, by definition, will then be ((F – D) – S) / S. Yet, if the target is opaque, the original price S is likely subject to discount by investors, too. Given the fact that the acquirer has more ability and stronger incentive than market investors in collecting more information about the target, it is not unreasonable to assume that information about the target is more asymmetric against investors than the acquirer. All else equal, the target price will be discounted more by investors than by the acquirer, leading to a *bigger* bid premium. This constitutes our first hypothesis:

Hypothesis 1: Other things being equal, there is a positive relationship between information asymmetry and the bid premium, i.e., the bid premium is lower for the target firm with higher information asymmetry.

1.2 Information and CAR

Information asymmetry may affect the market reactions to takeover announcements. We try to investigate the possible linkage between the target information asymmetry and the average announcement cumulative abnormal returns (CAR) of the bidder and the target. As Hietala, Kaplan, and Robinson (2001) point out, takeover announcement reveals information about the bidder overpayment, the stand-alone values of the bidders and the targets, and the potential synergies of the takeover. Hence, when the acquirer announces the takeover intension with its bidding price, the information triggers a revaluation of the bidder and the target. The question is how information asymmetry affects such revaluation.

According to Roll (1977), a firm can signal out a high-quality project through debt financing and leads to increase in firm value. This is because investors realize that the firm uses debt financing only if the probability of default is small and hence correctly infer this action as implying a high-quality project. Put into our takeover context, we argue that cash purchase (typically financed by debt issue anyway) signals bidder's confidence about the takeover "project" whereas stock purchase signals its uncertainty. Such an argument is consistent with the well documented fact that the bidder return tends to be positive if using cash purchase but significantly negative if using stock purchase.[1] Now, if the bidder uses cash to acquire a target opaque to the market, the market is likely to interpret the acquisition as the bidder knowing something the market does not know and hence revaluate the bidder more favorably. Indeed, Fishman (1989) analyze the bidder's use of cash in mergers and acquisitions. In his model, the cash offer

[1] Using information asymmetry to explain difference in bidder return due to different payment methods is not new but it typically refers to bidder's information asymmetry. Bidders obtain lower returns when an acquisition is financed with stock, because a bidder with private information about the value of its assets offers stock only when its shares are overvalued. See Travlos (1987), Hansen (1987), Berkovitch and Narayanan (1990), Eckbo, Giammarino, and Heinkel (1990), and Brown and Ryngaert (1991). Yet, it should be noted that Martin (1996) finds that the higher the acquirer's growth opportunities, the more likely the acquirer is to use stock to finance an acquisition.

signals the bidder's high valuation for the target and has the advantage of serving to preempt the competition of other bidders.

Although stock purchase is a bad signal, our question is its margin effect on bidder's announcement return when the target is more opaque. Officer et al. (2006) argue that the return should actually be positive when the target is extremely opaque, say, being a private company. The reason is presumably that stock, as a contingent contract, provides protection to the acquirer in case the target ends up being a "lemon". Such possibility is high when it is very difficult to evaluate an extremely opaque target such as a private company. If this argument is correct, we should observe its incremental impact on listed companies, too. Specifically, when a publicly listed target is more opaque, bidder's announcement return is expected to be *less negative* if the target has higher information asymmetry problem.

Putting all together, we seem to suggest that bidders should acquire opaque targets as the market rewards such a strategy, but this is not true. We only suggest that as long as takeover decisions are rational and the takeover market is efficient, the market would interpret the payment method of a takeover as endogenously determined. Given the target being opaque, cash acquisition would signal to the market that *the target is opaque only to the market but not to the acquirer* who is confident about the takeover value. On the other hand, stock acquisition would signal to the market that the acquirer does not have information advantage over the market about the target. In that case, stock as a contingent claim becomes a valuable payment method. In any case, this establishes our second hypothesis:

Hypothesis 2: There will be a positive relationship between target information asymmetry and the average announcement cumulative abnormal return of the bidder, controlling for the bid premium.

To test hypothesis 2, we need control for the bid premium because the bid price tends to affect aversely the acquirer's stock return.

We also postulate a similar positive relationship towards the *target* returns. About the standard finding of positive announcement return for the target, there are two traditional explanations. The synergy hypothesis suggests that the target firm's shareholders are expected to benefit from synergistic gains that will be realized after the takeover. The information hypothesis implies that the announcement of a takeover conveys favorable information about the target firm, either by providing a 'kick in the pants' that prompts inefficient managers to implement a higher-valued operating strategy, or by signaling that the target firm's shares are undervalued.

Brous and Kini (1993) study analysts' earnings forecasts for takeover targets and find that the announcement-month forecasts are systematically revised upward, especially for firms with low q-ratios that proxy for undervalued and/or mismanaged firms. According to Pound (1988), analysts' forecasts of

future earnings after a takeover announcement represent their expectations about the stand-alone prospects of the target firm and do not include the expected synergetic effect of the takeover. Hence, the upward revision of earnings forecast is supportive to the information hypothesis. Brous and Kini (1993) also find that takeover resistance has a neutral effect on the targets' stand-alone value in the sense of no significant forecast revisions for both the current- and following-year earnings during the resistance period. This further supports the hypothesis that a takeover announcement conveys favorable information about the target firm.

Along this line, we argue that, all else being equal, the information conveyed in the takeover announcement is more valuable if the value of a firm is more difficult to assess, leading to more favorable revaluation of the target value. This is especially so if the acquisition is in cash. Hansen (1987) argues that target shareholders will prefer equity offers to cash offers when they believe their equity is undervalued. By retaining an equity position in the merged entity, target shareholders can participate in the gains from the post-merger revelation of the previous target undervaluation. The other side of this argument would be that the acquirer shareholders will prefer cash offers if the target equity is undervalued so that they take all the gains from the revelation. This constitutes our third hypothesis:

Hypothesis 3: There will be a positive relationship between target information asymmetry and the average announcement cumulative abnormal return of the target, controlling for the bid premium

To test hypothesis 3, we also need control for the bid premium because the target's stock return is almost mechanically correlated positively with the bid price offered by the acquirer. However, we should emphasize that the target's cumulative abnormal return is NOT the same thing as the bid premium although they are highly correlated, as will be seen later.

2. Measures of Information Asymmetry

As pointed out by Officer (2007), information asymmetry is a notoriously difficult construct to measure and proxies so employed are naturally imprecise. We use four commonly used measures of information asymmetry of a firm and we also consolidate them into one information asymmetry index.

The first proxy is financial analyst coverage (COV), measured as the number of analysts following a target in the previous year of takeover announcement. Analysts collect, digest, and distribute information about a firm's performance. There is evidence that larger analyst coverage is likely to correspond to more information available about the firm. Lang and Lundholm (1996) find that analyst coverage is positively associated with disclosure scores. Frankel and Li (2004) find that increased analyst following is associated with reduced profitability of insider trades and reduced insider purchases. Several

papers including Brennan and Subrahmanyam (1995) and Hong, Lim, and Stein (2000) also use analyst coverage as a proxy for the supply of information about a firm.

Our second and third proxies are analyst forecast error (ERR), calculated as the ratio of the absolute difference between the forecast earnings and the actual earnings per share in the last month of the previous fiscal year of takeover announcement to the price per share at the beginning of the month, and forecast dispersion (DISP), calculated as the standard deviation of all earnings forecasts made in the last month of the previous year of takeover announcement. Analyst forecast error and forecast dispersion are widely used proxies for firms' information asymmetry (see Jennings and Mazzeo, 1993; Krishnaswami and Subramaniam, 1999; Thomas, 2002; Zhang, 2006, for instance). Generally, these literatures document that analyst forecast error and forecast dispersion decrease when firms disclose more information. Additionally, Elton et al. (1984) demonstrate that forecast errors become lower as the predictions get closer to the end of the fiscal year. They find that nearly 84% of the forecast error in the last month can be attributed to misestimation of firm-specific factors rather than economy- or industry-wide factors. This indicates that forecasts very near to the end of a forecasting period are especially appropriate to proxy for information asymmetry across firms.

The last proxy is the bid-ask spread (SPREAD). Models like Glosten and Milgrom (1985) and Easley and O'Hara (1987) argue that the adverse selection component of the bid-ask spread reflects the degree of "information asymmetry risk" perceived by the dealer. Many empirically studies show that firms with bigger bid-ask spreads have higher information asymmetry (e.g., Leuz and Verrecchia, 2000; Welker, 1995; Affleck-Graves, Callahan and Chipalkatti, 2002). In our paper, SPREAD is the daily relative bid-ask spreads averaged over the fiscal year before the announcement of the takeover where the daily relative spread is the ratio of the absolute value of the bid-ask spread over the midpoint of the spread.

Based on the four proxies we construct an information asymmetry index (INDEX) in the following fashion. We first divide each proxy into ten groups and rank them. For financial analyst coverage, we rank its reciprocal, as more coverage means lower information asymmetry. We then add the ranking number together and get a sum for each observation. Lastly, we divide the sum by the product of ten and the number of proxies the observation has. The reason for the index construction is two-fold. First, these proxies likely capture different facets of information asymmetry. Consolidating them into a single variable can hopefully come up with a "richer" measure of information asymmetry. Our index construction using simple average of the individual proxies assumes equal importance of the four proxies in capturing information asymmetry. Index construction also helps to maximize the regression sample size as we do not have all four proxies in some cases and the index so constructed is based on available proxies.

3. Data and Regression Model

3.1 Data Source and Data Selection

The sample of acquisitions in this paper comes from the Securities Data Company's (SDC) U.S. Mergers and Acquisitions Database. SDC database report deal characteristics like the announcement date, the bid price, the deal value, the payment method, the number of bidders, and so on. Data about the analysts' earnings forecasts are from the IBES database. IBES dataset reports a monthly mean, median, and standard deviation of the forecasts for each firm based on the analysts' estimates that are submitted that month. The financial data used in this paper comes from the COMPUSTAT database, and data about the stock return are from the CRSP database.

We first select data from the SDC database. We require that (1) both the acquirer and the target are American firms traded on NYSE, AMEX or the NASDAQ, (2) the deal value is equal to or greater than $ 1 million, (3) the takeover announcement date lies between 1985 and 2006. Our requirements yield 5853 acquisitions. We then delete events in which the completion date to the announcement date is more than 1000 days, and events missing data about the bidding premium. If the absolute value of the bidding premium is bigger than two-hundred, the transaction is also deleted. Applying these criteria, our sample is reduced to 4606 transactions. To control the deal characteristics, we delete events missing any data about the payment method, the acquisition form (merger or tender offer), the target management attitude, the accounting reporting method (pooling or not), the toehold of the bidder before the takeover attempt, the status of the acquisition (success or not), and the nature of the takeover (conglomerate or not). By doing so, our sample from SDC database is further reduced to 4025 transactions. Then, we merge the SDC database with the COMPUSTAT, CRSP and IBES database. We require that the transactions have financial data to calculate the firm-specific characteristics used in the paper, including target size, relative size of the target to the bidder, target sales growth and target market-to-book ratio. Our requirements eventually yield a sample of 1612 transactions used in this paper. We do not delete an acquisition if it misses data about the analyst forecasts, since we use several different information asymmetry measures in this paper.

(Insert Table 1 Here)

Table 1 shows the yearly distribution of our sample. Consistent with Moeller, Schlingemann and Harford (2005), Rhodes-Kropf, Robinson and Viswanathan (2005) and Andrade, Mitchell and Stafford (2001), the sample shows that the merger wave clustered in the late 1980s and late 1990s, and the number of acquisitions in the 1990s is dramatically larger than that in the 1980s.

3.2 Regression Model

The basic regression model used to test our hypotheses that information asymmetry affects the bidding premium and the announcement returns is as follows:

$$\text{Premium}_i/\ \text{BCAR}_i/\ \text{TCAR}_i = a + b*\text{Inf Proxy}_i + c*\text{Deal Char}_i + d*\text{Firm Char}_i + \varepsilon_i \quad (1)$$

We run three separate sets of regressions on Premium, BCAR, and TCAR. The first set has the bidding *Premium* as the dependent variable that comes directly from the SDC database (PREM4WK). It is the difference between the offer price and the target stock price four weeks prior to the takeover announcement date normalized by the latter. Such a definition of premium has been widely used in prior literatures (e.g. Rau and Vermaelen, 1998; Officer, 2003; Louis, 2004; Dong, Hirshleifer, Richardson, and Teoh, 2006).

The two other dependent variables to be used in separate sets of regressions are the average announcement cumulative abnormal return of the bidder (BCAR) and the target (TCAR). We estimate the abnormal returns over the five-day event window (-2, +2) using the market model with the CRSP value-weighted index as the market index. The parameters for the market model are estimated over the (-205, -6) interval.

Prior literatures show that the deal characteristics and some firm characteristics can significantly affect the bid price and the announcement abnormal return. We need to control them in order to see the effect of information asymmetry. The deal characteristics include the following elements. *Conglomerate* equals one if the primary business line of the bidder is different with the target and zero otherwise. The industry code of the primary business line of the bidder and target are from SDC dataset. Theoretically, Shleifer and Vishny (1990) argue that a manager has an incentive to enter new business line at which he might be better when the poor performance of his current firm threatens his job. Empirically, Morck, Shleifer and Vishny (1990) find that investors respond negatively to diversifying acquisitions, indicating that managers might overpay for the target. Thus, we expect *Conglomerate* to be related to the bid premium and target's abnormal return positively while related to bidder's abnormal return negatively.

The second controlling variable of deal characteristics added is *Toehold* which equals one if the bidder holds more than half of the target's shares outstanding before the takeover and zero otherwise. We expect that the bidding premium to the target is low, if the bidder is the controlling shareholder of the target. Prior literatures including Officer (2003) and Gaspar, Massa and Matos (2005) all document that the bidder pays less to the target if it owns more shares of the target prior takeover.

Literatures find that the existence of competitive bidders can enhance the bid price (e.g., Walkling and Edmister, 1985; Varaiya and Ferris, 1987; Haunschild, 1994). Thus, to control the effect of bidding competition, we include variable *Competition* which is the number of bidders in a takeover.

To control the form of the takeover, we include a dummy variable *Tender* which equals one if the takeover is advanced via tender offer and zero otherwise. Berkovitch and Khanna (1991) model that a merger is a bargaining game between the acquiring and target firms while a tender offer is an auction in which bidders arrive sequentially and compete for the target. In equilibrium, there exists a unique level of synergy gains, such that a bidder whose synergy gains are below this level does not attempt to take over the firm through a tender offer. Hence, acquisition via tender offer usually indicates a high synergetic gains and thereby a high bidding premium.

Target managerial resistance may affect the bidding premium and the success of the takeover. Theoretically, the target would be more likely to accept high bids than low ones (Hirshleifer and Titman, 1990). Empirically, Jennings and Mazzeo (1993) and Cotter and Zenner (1994) both find that bid premium is positively related with managerial resistance. Thus, we include a variable *Attitude* which equals one if the offer is resisted by the target and zero otherwise.

Earlier researches also examined the effect of accounting reporting method on the bid premium (e.g., Copeland and Wojdak, 1969; Andersen and Louderback, 1975; Nathan, 1988; Robinson and Shane, 1990; Ayres, Lefanowicz, and Robinson, 2000). They all document that when the pooling method was used to record acquisitions, a higher bid premium is generally paid. Hence, to control the effect of reporting method, we include a dummy variable *Pooling* which equals one if the pooling-of-interest accounting method is reported in takeovers and zero if the takeover is accounted for by the purchase method.

In the regression, we also include the payment method *Medium* which equals one for pure cash offer, two for offer with a mixture of cash and stock, and three for pure stock offer. Berkovitch and Narayanan (1990) model that both bidder and target abnormal return should be higher if the takeover is completed with cash offer. Their argument has been supported by numerous empirical studies (e.g., Travlos, 1987; Loughran and Vijh, 1997).

As to firm characteristics, previous literatures usually document a low power to explain both the bid premium and firm abnormal returns around takeover events. They have tentatively included in their regression firm characteristics like bidder/target leverage, ROA, price to earnings ratio, the ratio of operating cash flow to total asset, and so on (e.g., Schwert, 2000; Gaspar, Massa and Matos, 2005; Moeller, Schlingemann, and Stulz, 2004). However, these variables are usually insignificant, and sometimes the signs of the coefficients are even inconsistent among literatures. One exception is target size. Literatures generally find a significantly negative association between target size and bid premium and firm announcement abnormal return. Hence, to control for the effect of firm-specific characteristics, we include in the regression target size. Following Moeller, Schlingermann and Stulz (2004), *Target Size* is defined as the logarithm of target book value of total asset at the end of the fiscal year before the

takeover announcement.

The effect of bidder size on firm abnormal return is mixed. Schwert (2000) find that bidder size is significantly positively related to bidder abnormal return calculated for M&A announcement days (-63, +126). By contrast, using the same definition of bidder size and bidder abnormal return, Gaspar, Massa and Matos (2005) document a significantly negative association between them. In addition, they also document an insignificant positive relation between bidder size and bidder abnormal return calculated for M&A announcement days (-1, +1). Yet, Officer, Poulsen, and Stegemoller (2006) document a significantly negative relation between bidder size and bidder abnormal return calculated for M&A announcement days (-1, +1). On the other hand, many literatures document that the relative size of the target to the acquirer has impact on bid premium, target and bidder announcement abnormal return (e.g., Lang, Stulz and Walkling, 1991; Officer, 2004; Dong, Hirshleifer, Richardson and Teoh, 2006; Boone and Mulherin, 2007). Specifically, Bhagat, Dong, Hirshleifer and Noah (2005) make a detailed examination of the effect of the relative size on value improvements in M&A. They use several definitions of value improvement around takeover announcement including the bidder abnormal return, the target abnormal return, the combined abnormal return of the bidder and the target, and the probability-adjusted combined abnormal return, and so on. They document a significantly negative relation between relative size of the target to the bidder and each definition of value improvement. Hence, consistent with them, we also include the relative size instead of bidder size in the regression to adjust for the impact of the equity market capitalization of the acquiring firm. Here, *Relative Size* is the ratio of target market value of common stock to that of the bidder at the end of the fiscal year before takeover announcement.

Except for firm size, we include in the regression target valuation *Market-to-Book* which is the ratio of target market value of common stock to book value of equity at the end of the fiscal year before takeover announcement. Dong, Hirshleifer, Richardson and Teoh (2006) find that higher target valuation is associated with a lower bid premium and a lower target announcement-period return. They also examine the effect of bidder valuation on bid premium and target announcement-period return, and document an insignificant association. In addition, using book-to-market ratio and Tobin's Q, Moeller, Schlingemann, and Stulz (2005) also documents that bidder valuation has no effect on bidder abnormal return.

We also include in the regression *Sales Growth* which is the target's proportional change in sales in the year before takeover announcement. Morck, Shleifer and Vishny (1990) specifically examine the effect of buying a growing firm on the market value of the bidders. They find that returns to bidding shareholders are lower when the bidder buys a rapidly growing target. Gaspar, Massa and Matos(2005) also find that target sales growth is negatively related to both bid premium and target abnormal return.

4. Basic Results

4.1 *Data Description*

To get a sense of the data, we present the descriptive statistics about the characteristics of the deal, the target and the information asymmetry proxies in Table 2.

(Insert Table 2 Here)

For the whole sample, the average (median) bid *Premium* is 41.52% (35.85%) and yet, there are negative premiums with the minimum being -92.94%. The average bidder cumulative abnormal return (BCAR) over five days around the announcement period is mildly negative of -1.2% (median being -0.9%) whereas the average target cumulative abnormal return (TCAR) over the same period is highly positive of 21.60% (median being 17.60%).

As for takeover characteristics, 69% of the bidders acquire a firm in another industry (*Conglomerate*). 12% of the bidders acquire a *Toehold* of the target, i.e., holding more than half of the target's outstanding shares. On average, there is one bidder in each acquisition while the maximum is four. In more detail, of the 1612 takeovers, 1491 (92.5%) has only one bidder, 95 (5.9%) has two bidders, 22(1.4%) has three bidders, and 4 (0.25%) has four bidders. These numbers may not reflect the true, severe nature of the bidding competition in our sample. As Boon and Mulherin (2007) find that the public takeover announcement is only a small part of the whole takeover process. Before the public announcement, there is a highly competitive market while the remainder negotiates with a single bidder. On the other hand, out of the 1,612 takeovers, 22% are advanced via the tender offer (*Tender*), 12% are resisted by the target (*Attitude*), and 17% are reported with the pooling accounting method (*Pooling*). As to the payment method (*Medium*), the average (median) number is 2.06 (2), indicating a substantial portion of transactions in our sample are completed with stock. In more detail, of the 1612 takeovers, 552 (34.2%) are completed with pure cash, 442 (27.4%) are completed with a mixture of cash and stock, while 618 (38.4%) are completed with pure stock.

As for firm characteristics, for 1,612 target firms, the average (median) sales growth is 0.38 (0.129); the average (median) number market-to-book ratio is 2.65 (1.70); the average (median) logarithm of the book value of total asset is $ 4.80 (4.86) million. The market value of the target is 34% that of the bidder on average (*Relative Size*).

Our key variables, the information proxies, have the following characteristics. There is a big difference in analyst coverage (*COV*) among the targets. The maximum number of analysts following a target is 29 while the minimum is 1, the average (median) being 4.45 (3). The earnings forecast errors (*ERR*) averages to 0.031 but the median value is low, equal to 0.004. The forecast dispersion (*DISP*) is

also low with a mean (median) value of 0.01 (0.0021). The average (median) bid-ask *spread* is 0.037 (0.03). Our information *INDEX* constructed based on these four proxies averages to 0.56.

(Insert Table 3 Here)

Panel A of Table 3 shows the Pearson correlations between the testing variables and information asymmetry proxies. The top three rows of the panel show that Premium, BCAR, and TCAR are significantly correlated with all the information proxies. Specifically, they are negatively related with analyst coverage, and positively related with analyst forecast error, forecast dispersion, bid-ask spread and the information asymmetry INDEX. This provides some initial evidence that targets with high opaqueness receive high bid premium, high announcement returns for both bidder and target in takeovers. On the other hand, the correlation coefficient between Premium and BCAR is merely 0.04 and has no statistical significance. On the contrary, the correlation between Premium and TCAR is very high with a coefficient of 0.57 which is significant at the 1% level. As said before, although Premium and TCAR are highly correlated, they are not the same thing and TCAR over the 5-day window is typically lower than Premium as revealed by their mean and median values shown in Table 2.

Notice that information asymmetry proxies are correlated among each other. Analyst coverage is correlated with bid-ask spread (Pearson=-0.4). Analyst forecast error is correlated with forecast dispersion (Pearson=0.36). Information asymmetry INDEX is highly correlated with analyst coverage (Pearson correlation=-0.55) and bid-ask spread (Pearson correlation=0.63). It also correlates with analyst forecast error (Pearson correlation=0.24) and forecast dispersion (Pearson correlation=0.27). The correlations are all very significant (p value<0.01). These indicate that the constructed INDEX captures reasonably well the other four proxies.

Panels B and C show the correlations between the testing variables with proxies of takeover characteristics and target characteristics to be used as control variables in our subsequent regressions. The correlation coefficients clearly indicate the importance of putting in such control as most of them are statistically significant.

4.2 Results on Sorting

Before doing the regression analysis, we do a few sorting to have preliminary looks at the linkage of the bid premium, BCAR, and TCAR on information asymmetry. Essentially, we sort target firms into five deciles based on the values of the five information proxies. We then find the average value of the bid premium, BCAR, and TCAR within deciles. Recall that for the analyst forecast, we rank their reciprocal so that high value means high opacity, being consistent with other information proxies. Results are

presented in table 4.

(Insert Table 4 Here)

Panel A shows the results on the bid premium. Several interesting facts reveal in the table. First, the average bid premium is significantly positive for all deciles. Second, the bid premium is almost invariably increasing monotonically in information asymmetry for all information proxies. This supports further our Hypothesis 1 that there is a positive relation between the bidding premium and target information asymmetry. Lastly, there is a significant difference in the bid premium of targets of the highest information asymmetry and the bid premium of targets of the lowest asymmetry across all information proxies. For instance, the average bid premium for targets of the lowest ranking in INDEX (i.e., most transparent) is 33.99% and that for targets of the highest ranking (i.e., most opaque) is 47.01%. Their average difference of 13.02% is highly significant with a p-value lower than 0.01%.

Panel B shows the results on BCAR. Again, there are a couple of points worth mentioning. First, the monotonic increasing property shows up clearly in every column of information proxy. Take INDEX again as an example. The average BCAR of the lowest ranking (most transparent) is -2.7% and that of the highest ranking (most opaque) is 0.3%. Their average difference of 3% is highly significant of a p-value lower than 0.01%. Second, the average BCAR is generally negative, which is consistent with the literature, but some BCAR figures show up positive at the bottom where firms are highly opaque. It is true that these positive BCARs are statistically equivalent to zero. Yet, negative BCARs are typically highly significant. All these post up a picture that when the target becomes more and more opaque, the market agrees more with the takeover decision through discounting less on the bidder's stock price. The evidence hence is supportive to Hypothesis 2.

Panel C shows the results on TCAR and reveals similar monotonic increasing patterns of TCAR against information asymmetry across all information proxies. In the INDEX column, the average TCAR of the lowest ranking (most transparent) is 14.8% and that of the highest ranking (most opaque) is 24.3%; both are statistically significant at any conventional level. Their average difference of 9.5% is also statistically significant. Hypothesis 3 of higher TCAR under higher information asymmetry is hence supported. Putting all three results together, we observe that when the target becomes more opaque, the bidder premium tends to be higher and the market reacts more positively to the takeover announcement by placing less discount on the acquirer's stock price and pushing up more the target stock price.

4.3 Regression Results

As said, the bid premium, BCAR, and TCAR are found to be affected by many factors that need to be controlled for before we can conclude that information asymmetry matters. We hence run regression

model (1) putting in important control variables. Within each set of regressions, we run five specifications on the five information asymmetry proxies ("Inf Proxy") of *COV*, *ERR*, *DISP*, *SPREAD*, and *INDEX* which are the testing variables.[2] Regression results are presented in Table 5.

(Insert Table 5 Here)

4.3.1 Bid Premium

We first look at the results on the bid premium which is significantly positively related with forecast error (coefficient of 56.08 with a p-value of 4.10%), forecast dispersion (coefficient of 226 with a p-value of 9.76%), bid-ask spread (coefficient of 71.31 with a p-value of 4.90%), and information asymmetry INDEX (coefficient of 12.74 with a p-value of 0.96%). As expected, bid premium is negatively related with analyst coverage (coefficient of -0.36 with a p-value of 20.56%), although the relation is not significant in the traditional level.

A bit surprising is that a few control variables do not seem to be important to the bid premium. For instance, competitive bidding should bring up the bid premium according to the prior literature (Walkling and Edmister, 1985; Varaiya and Ferris, 1987; Haunschild, 1994). Yet, "Competition" does not show significant relationship. One possible reason is that we use the number of public bidders announced to measure the competitiveness of the takeover market. However, Boon and Mulherin (2007) argue that such a proxy cannot represent the real case of takeover market in 1990s. The public takeover announcement is only a small part of the whole takeover process. Before the public announcement, there is a highly competitive market while the remainder negotiates with a single bidder.

Also, target management resistance should bring upward pressure to the bid premium if resistance is due to the bid price below the "true" value of the target (Jennings and Mazzeo, 1993; Cotter and Zenner, 1994). Yet, "Attitude" shows uniform, statistical insignificance in all specifications. The effect of managerial resistance on bid premium has been examined by some researchers. However, there is no consistent result. Whether or not managerial resistance can enhance bid premium depend on the motivation of the resistance. Baron (1983) argued that there are mainly two possible reasons why a manager would resist an offer. On the one hand, a manager may resist an offer because he wants to preserve his jobs, perquisites, or the share of any agency costs he is capturing (Martin and Mcconnell, 1991; Mikkelson and Partch, 1997; Kini, Kracaw and Mian, 1995, 2004; Knoeber, 1986). Resistance of this type is harmful to the investors. Wulf (2004) find that CEOs negotiate shared control in the merged firm in exchange for lower shareholder premiums. Hartzell, Ofek, and Yermack (2004) find that CEOs trade personal wealth for shareholders' premium in takeover-target shareholders receive lower acquisition

[2] We delete 1% outliers of the dependent variables and information asymmetry proxies in all regressions.

premium in transactions involving extraordinary personal treatment of CEOs. On the other hand, a manager also may resist an offer because the bid price is below the "true" value of the target. Since the likelihood of a competing offer is significantly increased with the existence of target management resistance (Jennings and Mazzeo, 1993) and competition can enhance the bid price (Varaiya and Ferris, 1987; Haunschild, 1994), managerial resistance of this type is beneficial to shareholders. Indeed, based on Hirshleifer and Titman's (1990) argument that the target would be more likely to accept high bids than low ones, Jennings and Mazzeo (1993) and Cotter and Zenner (1994) both find that bid premium is positively related with managerial resistance.

As for the target characteristics, the relative size of the target to the bidder has significant negative impact on the bid premium which is consistent with other studies. Target asset size is also negatively correlated with the bid premium. It is conceivable that small firms are likely to have more serious information asymmetry problems than large firms. Hence, firm size itself could be a proxy for information asymmetry but we choose to use it as a control variable because studies typically find significant relationship between firm size and the bid premium. But as such, firm size and our information proxies likely generate some degree of multicollinearity problem which would lower the p-values of the estimates.[3]

All in all, even after controlling for the deal and target characteristics, we find supporting evidence of Hypothesis 1 that high opaque targets tend to receive high bid premiums in takeovers.

4.3.2 Bidder's Cumulative Abnormal Return, BCAR

Hypothesis 2 postulates a positive relationship between information asymmetry and bidder's cumulative abnormal return of the bidder (BCAR) over. We use the regression model (1) with the dependent variable being the average announcement cumulative abnormal return of the bidder, BCAR to formulate the test. Panel B of Table 5 presents the result.

In Specification 1, analyst coverage COV has negative impact on BCAR with a coefficient of -0.002 and a p-value of 0.75%. Since more coverage reduces information asymmetry, it supports the hypothesis that higher information asymmetry leads to higher bidder abnormal returns. Other information asymmetry proxies such as forecast error (Specification 2), forecast dispersion (Specification 3), and bid-ask spread (Specification 4) exhibit uniformly a positive linkage with BCAR although weak in statistical significance in general. The last column shows the combined information proxy INDEX having a

[3] The results are generally robust whether we use total assets or total equities, book value or market value, with or without logarithmic transformation. The exception is in the case of the log of market value of equities, log(MVE), due to more serious multicollinearity. The Pearson correlation coefficients of log(MVE) and COV, ERR, DISP, SPREAD, INDEX are 0.52, -0.18, -0.21, -0.54, and -0.68, respectively, which are uniformly higher than their corresponding equivalence of other size measures. But even that, when we orthogonalized log(MVE) against individual information proxies and used the residuals to re-run all the tests, the results re-appear in the way that the residual log(MVE) entered significantly negatively and the information proxies entered significantly positively in all the Premium regressions. See more in the discussion of Table 6.

coefficient of 0.03 with a p-value almost significant at the 1% level. Again, this means that higher information asymmetry leads to higher bidder abnormal returns.

As for control variables, consistent with Morck, Shleifer and Vishny (1990), BCAR is significantly negatively related to target sales growth. BCAR is higher if there is biding competition, and if the takeover is completed with cash. In general, the bidder experiences lower abnormal return if it acquires a big target or a target with a high market-to-book ratio. Note that, relative size of the target to that of the bidder is not significant in our heteroscedasticity-corrected regression, using white-adjustment. Prior literatures usually (e.g., Lang, Stulz and Walkling, 1991; Dong, Hirshleifer, Richardson and Teoh, 2006; Boone and Mulherin, 2007; Bhagat, Dong, Hirshleifer and Noah, 2005) document a significantly negative relation between bidder abnormal return and relative size of the target to that of the bidder. We checked carefully and found that all of these literatures use OLS regression. Indeed, when we also use OLS regression, we also document that the coefficient of the *Relative Size* is very significantly negative in each regression (P value <0.01). Meantime, using OLS regression, we find that the significance of all of our information asymmetry proxies is also strengthened.

4.3.3 Target's Cumulative Abnormal Return, TCAR

In this part, we use regression model (1) to test Hypothesis 3 to see if information asymmetry affects the returns of the target over the takeover announcement period. The dependent variable hence is the target cumulative abnormal return, TCAR. However, the linkage between TCAR and information asymmetry can be "mechanical" given our finding that information asymmetry has impacts on the bid premium which, in turn, is significantly correlated with TCAR (equal to 0.57 in Table 3A). To cater for this, we add in the model another control term, *ResPremium* which is the residuals of the bid premium from orthogonalizing against each of the information asymmetry proxies.

Indeed, this term enters significantly and positively in all five regressions, as shown in Panel C of Table 5. But more importantly, the information proxies remain significant in most of the regressions. Forecast error (ERR) and bid-ask spread (SPREAD) exhibit positive linkage with TCAR with coefficients of 0.07 (p-value of 3.62%) and 0.33 (p-value of 9.90%), respectively. Forecast dispersion (DISP) also bears a positive coefficient although bearing no statistical significance. Analyst coverage (COV) has negative impact on TCAR but also nears no statistical significance. The combined proxy INDEX shows up highly significant with a p-value of 0.28%. Hence, results support the hypothesis that target abnormal returns will be higher if the takeover target has higher information asymmetry problem.

Most of the control variables on deal characteristics enter significantly into the regressions. However, as to firm characteristics, none of them are significant. This is perhaps due to the existence of bidding premium in the regression.

5. Robustness Tests

To confirm our previous results not driven by special takeover samples, we perform a few robust checks by dividing the full sample in various ways and re-run the regressions. Sample splitting is based on some key control variables that found to affect bid premium, BCAR, and TCAR the most. They are the payment method of the deal characteristics and the bidder, target, and relative size of the firm characteristics. To save space, we present only results with INDEX as the information asymmetry proxy.

5.1 Sorting Results

Following the previous presentation order, we start the robust check on sorting based on information asymmetry level. For the payment method, we split the sample into CASH payment, MIXTURE payment, and STOCK payment. Within each group, we sort it according to the value of the information proxy, INDEX and form two subgroups. LOW is for those INDEX value below the mean and HIGH is for those above the mean. We then contrast their mean values. Similar approach is done on firm characteristic control variables. Results are presented in Table 6.

(Insert Table 6 Here)

Panel A gives results on the bid premium. The first major column is on the payment method. For CASH payment group, the average bid premium on target firms of LOW information asymmetry (i.e. more transparent firms) is 40.26%. The average bid premium on target firms of HIGH information asymmetry (i.e. more opaque firms) is 45.52%. The mean difference ("High – Low") is 5.26% which is marginally significant at the 10% level. The stronger result comes from the STOCK payment group in which the mean premium difference between transparent and opaque targets is 6.62% which is statistically significant almost at the 2% level. Similar situation exists also in the MIXTURE group. Hence, it is confirmed that the bid premiums tend to be higher for more opaque targets, no matter the acquisition is paid by cash or paid by stock.

For SMALL bidders (the second major column), the mean premium difference between transparent and opaque targets is 7.94% with a p-value of 1.18%. For MEDIUM bidders, the difference is 12.49% (p-value smaller than 0.01%) and for BIG bidders, the difference is 2.49% but without statistical significance. For SMALL targets (the third column), the mean premium difference is 8.96% with a p-value of 1.10%. For MEDIUM and BIG bidders, the differences are, respectively, 1.94% and 4.22%, both lack of statistical significance. If focusing on the relative size between the target and the bidder (the last column), the differences are also significant for the SMALL and BIG groups. Again, these results confirm

that the bid premiums are higher for more opaque targets, no matter the bidder or the target is large or small.

Panel B shows the results on BCAR. For CASH payment, the average BCAR for Low information asymmetry targets is 0.03% while that for High asymmetry targets is 1.05%. Their difference is a significant 1% of a p-value of 3.49%. Notice that for STOCK payment, the average BCAR is negative in general but still, it is *less* negative for targets of High information asymmetry. In fact, the mean difference for this group is even larger, a 2.2% difference with a p-value of 0.76%. If looking across different size partitions, we observe generally similar and significant differences in BCAR between Low and High information asymmetry target groups. Hence, the relationship of higher BCAR for more opaque targets upholds under these partitions.

Such claim is also true for TCAR, as shown in Panel C. We observe that High information asymmetry targets generally earn a significantly higher announcement returns than Low information asymmetry targets under our various partitions.

5.2 Regression Results on Bid Premium

We move on to the robust check on regression results. To save space, we present in Table 7 only the results on payment methods as interesting observations are found.[4]

(Insert Table 7 Here)

Results in Panel A confirm our Hypothesis 1 of a general positive premium-information asymmetry link in all three types of payment methods. Yet, such link shows no statistical significance under the cash payment method as the p-value of INDEX coefficient is a mere 12.32%. Hence, when the target is more opaque, the bid premium tends to be higher but the acquirer will also use stocks at least as part of the payment method. This is consistent with Officer et al.'s (2006) view about stock being an optimal contract under the situation of high information asymmetry.

If looking at the market reaction to the bidder upon its acquisition announcement (Panel B), the results again confirm our Hypothesis 2 of positive link between BCAR and information asymmetry. Notice that both cash and stock purchases give significant results with respective INDEX coefficients being 0.037 (p-value of 1.76%) and 0.055 (p-value of 3.71%). Our restriction test, not reported here, shows that the coefficients are significantly different, confirming the notion of stock being an optimal

[4] Results on size and relative size are available upon request. Essentially, the coefficients of INDEX are highly significant in all regressions over all sub-samples (p-value less than 1%) except for "big relative size" in the bid premium regression (p-value being 9%). That is to say, when the target is large relative to the bidder, information asymmetry is not that important in determining the bid premium.

contract under asymmetric information. Furthermore, the significant result under cash payment echoes our previous argument on the *ex post* signaling effect of cash bidding under information asymmetry. When the target is opaque, the market expects the acquirer to use some stocks for downside protection. Yet, if the acquirer uses cash, the market interprets the information asymmetry as more between the market and the target than between the acquirer and the target. Acquirer's cash bidding sends a strong and credible signal that the acquirer understands the target better than the market. Such interpretation is supported by results in Panel C where the target returns (TCAR) is higher if a more opaque target is bid by cash with a p-value of 2.14%. Stock acquisition also gives a strong result with the INDEX coefficient being 0.093 and the p-value being 6%.

6. Conclusion

Although information asymmetry is a crucial concept in finance, its importance in the takeover context has not been well studied empirically. To fill the void, we examine 1,612 acquisitions of publicly listed targets over the period of 1985 – 2006 and test directly how information asymmetry affects the bidding premiums and the announcement returns of acquiring and target firms.

The four proxies for information asymmetry of a firm we use in our study are analyst coverage, analyst forecast error, forecast dispersion, and the bid-ask spread which are commonly used in other studies. Based on these four proxies, we also construct an information asymmetry index. Based on these information asymmetry proxies, we find that they associate positively with the bid premiums. We argue that the positive association is conceivable so long as the acquirer has information advantage over market investors toward the target. To the extent that information risk is factored in firm valuation, the pricing discount by the market tends to be more severe than that by the acquirer, leading to higher bid premium under higher opacity of the target firm.

We also find positive relationship between information asymmetry proxies and announcement cumulative abnormal returns of the acquirer as well as the target over the five-day event window. One possible explanation is that when the target is more opaque to the market, it is more credible that the takeover announcement reveals the acquirer having information advantage over the market, leading to more favorable re-evaluation on both the acquirer and the target.

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Table 1
Sample distribution by announcement year

This table presents the yearly distribution of our sample which contains 1612 mergers and acquisitions announced between 1986 and 2006. In the sample, both the acquirer and the target are American firms traded on NYSE, AMEX or the NASDAQ, and the deal value is equal to or greater than $ 1 million.

Year	Number	Ratio
1986	30	1.86%
1987	33	2.05%
1988	62	3.85%
1989	43	2.67%
1990	23	1.43%
1991	30	1.86%
1992	26	1.61%
1993	34	2.11%
1994	38	2.36%
1995	103	6.39%
1996	113	7.01%
1997	167	10.36%
1998	168	10.42%
1999	182	11.30%
2000	120	7.44%
2001	110	6.82%
2002	67	4.16%
2003	85	5.27%
2004	89	5.52%
2005	68	4.22%
2006	21	1.30%
TOTAL	1612	100%

Table 2
Descriptive statistics of the variables

This table presents the descriptive statistics of the variables used in this paper. *Premium* is calculated as 100 *(offer price-target stock price of four weeks prior announcement) /target stock price of four weeks prior takeover announcement. *BCAR* is the bidder abnormal returns over the five-day event window (-2, +2) using market model benchmark returns with the CRSP value-weighted index returns. *TCAR* is the target abnormal returns over the five-day event window (-2, +2) using market model benchmark returns with the CRSP value-weighted index returns. *Conglomerate* equals one if the primary business line of the bidder is different with the target and zero otherwise. *Toehold* equals one if the bidder holds more than half of the target's shares outstanding before the takeover and zero otherwise. *Competition* is the number of bidders in a takeover. *Tender* equals one if the takeover is advanced via tender offer and zero otherwise. *Attitude* equals one if the offer is resisted by the target and zero otherwise. *Pooling* equals one if the pooling-of-interest accounting method is reported in takeovers and zero if purchase method is used. *Medium* equals one for pure cash offer, two for offer with a mixture of cash and stock, and three for pure stock offer. *Sales Growth* is the target's proportional change in sales in the year before takeover announcement. *Market-to-Book* is the ratio of market value of target common stock to book value of equity at the end of the year before takeover announcement. *Target Size* is the logarithm of book value of target total asset at the end of the year before takeover announcement. *Relative Size* is the ratio of the market value of target common equity to that of the bidder at the end of the year before takeover announcement. *COV* is the number of analysts following a target in the year before takeover announcement. *ERR* is the ratio of the absolute difference between the forecast earnings and the actual earnings per share in the last month of the previous year of takeover announcement to the price per share at the beginning of the month. *DISP* is the standard deviation of all earnings forecasts made in the last month of the previous year of takeover announcement. *SPREAD* is the annual average of the daily relative bid-ask spread defined as the absolute value of the bid-ask spread divided by the average of bid and ask in the previous year of announcement. *INDEX* is constructed by consolidating the four information asymmetry measures: *COV*, *ERR*, *DISP* and *SPREAD*.

Variable	Number	Mean	STD DEV	Min	Median	Max
Testing Variables						
Premium	1612	41.52	37.99	-92.94	35.85	200
BCAR	1078	-0.012	0.079	-0.839	-0.009	0.505
TCAR	1276	0.216	0.252	-0.739	0.176	3.370
Deal and Firm Characteristics						
Conglomerate	1612	0.69	0.46	0	1	1
Toehold	1612	0.12	0.33	0	0	1
Competition	1612	1.08	0.33	1	1	4
Tender	1612	0.22	0.41	0	0	1
Attitude	1612	0.12	0.32	0	0	1
Pooling	1612	0.17	0.37	0	0	1
Medium	1612	2.06	0.88	1	2	3
Market-to-Book	1612	2.65	3.71	0.08	1.70	66.63
Sales Growth	1612	0.38	2.45	-1.0	0.129	82.76
Target Size	1612	4.80	1.19	0.11	4.86	6.90
Relative Size	1612	0.34	0.74	0.0001	0.12	10.08
Information Asymmetry Proxies						
COV	1199	4.45	3.97	1.0	3	29.0
ERR	1151	0.031	0.16	0	0.004	3.21
DISP	989	0.01	0.043	0	0.0021	0.74
SPREAD	1499	0.037	0.035	0.0014	0.03	0.60
INDEX	1612	0.56	0.17	0.1	0.56	1.0

Table 3
Pearson correlation among variables used

This table shows the Pearson correlation among variables used in the regression. Variable definitions are in Table 2. Significance at the 10%, 5%, and 1% level is noted by *, **, and ***, respectively.

Panel A. Testing variables with Information Proxies and Firm Characteristics

	Premium	BCAR	TCAR	COV	ERR	DISP	SPREAD	INDEX	Market-to-Book	Sales Growth	Target Size	Relative Size
Premium	1	0.04	0.57***	-0.05**	0.11***	0.08***	0.09***	0.12***	-0.02	0.02*	-0.09***	-0.10***
BCAR		1	0.07**	-0.13***	0.04**	0.08***	0.09***	0.14***	-0.05*	-0.06**	-0.09***	-0.09***
TCAR			1	-0.07*	0.06***	0.03*	0.06**	0.13***	-0.03	0.01	-0.07***	-0.08***
COV				1	-0.03	-0.03	-0.40***	-0.55***	0.09***	-0.03	0.36***	0.14***
ERR					1	0.36***	0.25***	0.24***	-0.08***	-0.01	-0.03*	-0.04
DISP						1	0.07**	0.27***	-0.07**	-0.01	-0.05*	-0.03
SPREAD							1	0.63***	-0.12***	-0.01	-0.37***	-0.09***
INDEX								1	-0.19***	-0.001	-0.42***	-0.10***
Market-to-Book									1	0.08***	-0.07***	0.03
Sales Growth										1	-0.06**	-0.01
Target Size											1	0.09***
Relative Size												1

Panel B. Testing variables with Deal Characteristics and Firm Characteristics

	Premium	BCAR	TCAR	Conglomerate	Toehold	Competition	Tender	Attitude	Pooling	Medium	Market-to-Book	Sales Growth	Target Size	Relative Size
Premium	1	0.04	0.57***	0.03	-0.17***	0.05**	0.16***	-0.05**	0.06***	-0.02	-0.02	0.02*	-0.09***	-0.10***
BCAR		1	0.07**	-0.02	0.03	0.06**	0.12***	0.01	-0.09***	-0.17***	-0.05*	-0.06**	-0.09***	-0.09***
TCAR			1	0.04	-0.12***	-0.04*	0.18***	-0.01	-0.01	-0.13	-0.03	0.01	-0.07***	-0.08***
Conglomerate				1	0.08***	0.03	0.10***	0.05**	-0.04*	-0.08***	0.01	-0.01	-0.01	0.002
Toehold					1	-0.09***	-0.01	0.32***	-0.17***	-0.26***	0.01	0.04	0.01	0.03
Competition						1	0.14***	0.18***	-0.07***	-0.07***	-0.06**	-0.01	0.03	0.13***
Tender							1	0.13***	-0.23***	-0.45***	-0.01	0.02	-0.03	-0.0003
Attitude								1	-0.15***	-0.25***	-0.06***	-0.02	0.04	0.18***
Pooling									1	0.46***	0.09***	0.02	0.02	-0.03
Medium										1	0.11***	0.04	0.06**	0.03
Market-to-Book											1	0.08***	-0.07***	0.03
Sales Growth												1	-0.06**	-0.01
Target Size													1	0.09***
Relative Size														1

Panel C. Information Proxies with Deal Characteristics

	COV	ERR	DISP	SPREAD	INDEX	Conglomerate	Toehold	Competition	Tender	Attitude	Pooling	Medium
COV	1	-0.03	-0.03	-0.40***	-0.55***	-0.002	0.01	0.04	-0.01	0.11*	0.07***	0.04
ERR		1	0.36***	0.25***	0.24***	0.01	0.08***	0.09***	0.03	-0.03	-0.06**	-0.02
DISP			1	0.07**	0.27***	0.03	0.02	-0.01	0.02	-0.04	-0.06**	-0.01
SPREAD				1	0.63***	-0.004	0.004	-0.05**	-0.03	-0.04	-0.01	0.01
INDEX					1	0.02	0.04	-0.05*	0.04*	-0.02	-0.11***	-0.07
Conglomerate						1	0.08***	0.03	0.10***	0.05**	-0.04*	-0.08***
Toehold							1	-0.09***	-0.01	0.32***	-0.17***	-0.26***
Competition								1	0.14***	0.18***	-0.07***	-0.07***
Tender									1	0.13***	-0.23***	-0.45***
Attitude										1	-0.15***	-0.25***
Pooling											1	0.46***
Medium												1

Table 4
Sorting based on Information Asymmetry Level

This table shows the average bid premiums, bidder's cumulative abnormal return (BCAR), and target's cumulative abnormal return (TCAR) of 5 deciles sorted by information asymmetry level. *1/COV* is the reciprocal of *COV* which is the number of analysts following a target in the previous year of takeover announcement. *ERR* is the ratio of the absolute difference between the forecast earnings and the actual earnings per share in the last month of the previous year of takeover announcement to the price per share at the beginning of the month. *DISP* is the standard deviation of all earnings forecasts made in the last month of the previous year of takeover announcement. *SPREAD* is the annual average of the daily relative bid-ask spread defined as the absolute value of the bid-ask spread divided by the average of bid and ask in the previous year of announcement. *INDEX* is constructed by consolidating the four information asymmetry measures: *COV*, *ERR*, *DISP* and *SPREAD*. P values are reported in parentheses. Significance at the 10%, 5%, and 1% level is noted by *, **, and ***, respectively.

Panel A. Bid Premium

	1/COV	ERR	DISP	SPREAD	INDEX
D1 (low)	39.86***	35.56***	37.27***	33.66***	33.99***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D2	39.93***	38.64***	36.96***	39.57***	38.12***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D3	41.09***	40.43***	44.13***	39.57***	39.23***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D4	43.32***	45.89***	43.46***	43.06***	44.89***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D5 (high)	44.06***	45.48***	43.61***	45.23***	47.01***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D5-D1	4.20*	9.93***	6.34*	11.57***	13.02***
	(0.0826)	(0.0015)	(0.0813)	(<.0001)	(<.0001)

Panel B. BCAR

	1/COV	ERR	DISP	SPREAD	INDEX
D1 (low)	-0.032***	-0.025***	-0.027***	-0.032***	-0.027***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D2	-0.023***	-0.016***	-0.018***	-0.015***	-0.020***
	(<.0001)	(<.0001)	(<.0001)	(0.0026)	(<.0001)
D3	-0.013**	-0.020***	-0.023***	-0.012*	-0.014***
	(0.0294)	(0.0010)	(<.0001)	(0.0586)	(<.0001)
D4	-0.007***	-0.009***	-0.017**	0.00013	-0.005
	(0.0097)	(<.0001)	(0.0154)	(0.9769)	(0.7834)
D5 (high)	0.001	-0.009*	-0.007	0.00015	0.003
	(0.5020)	(0.0612)	(0.2191)	(0.9782)	(0.5307)
D5-D1	0.033***	0.016**	0.02***	0.033***	0.03***
	(<.0001)	(0.0190)	(0.0014)	(<.0001)	(<.0001)

Panel C. TCAR

	1/COV	ERR	DISP	SPREAD	INDEX
D1 (low)	0.200***	0.166***	0.172***	0.184***	0.148***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D2	0.210***	0.175***	0.209***	0.192***	0.199***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D3	0.209***	0.196***	0.211***	0.209***	0.217***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D4	0.207***	0.280***	0.214***	0.202***	0.241***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D5 (high)	0.228***	0.241***	0.222***	0.264***	0.243***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
D5-D1	0.029*	0.075***	0.05**	0.08***	0.095***
	(0.0846)	(0.0034)	(0.0440)	(0.0003)	(<.0001)

Table 5
Regressions on Bid Premium, BCAR, and TCAR

This table presents the regression results of the following regression model:

$$Premium_i / BCAR_i / TCAR_i = a + b*Inf\ Proxy_i + c*Deal\ Char_i + d*Firm\ Char_i + \varepsilon_i$$

There are three sets of regression results, one on the bid premium, one on the bidder's 5-day cumulative abnormal returns (BCAR), and the last on target's 5-day cumulative abnormal returns (TCAR). "Inf Proxy" consists of five information asymmetry proxies of COV, ERR, DISP, SPREAD, and INDEX. "Deal Char" is the deal characteristics of Conglomerate, Toehold, Competition, Tender, Attitude, Medium and Pooling. "Firm Char" is the firm characteristics of Sales Growth, Market-to-Book, Target Size, and Relative Size. Variable definitions are in Table 2. Significance is based on White-adjusted standard errors with *p*-values reported in parentheses. Significance at the 10%, 5%, and 1% level is noted by *, **, and ***, respectively.

Panel A. Bid Premium

	1	2	3	4	5
Intercept	42.71***	48.20***	50.59***	39.21***	34.63***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
COV	-0.36				
	(0.2056)				
ERR		56.08**			
		(0.0410)			
DISP			226*		
			(0.0976)		
SPREAD				71.31**	
				(0.0490)	
INDEX					12.74***
					(0.0096)
Conglomerate	0.96	0.75	1.32	4.24**	2.19
	(0.1586)	(0.7010)	(0.5173)	(0.0110)	(0.2631)
Toehold	-19.52***	-21.47***	-18.45***	-18.05***	-18.88***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Competition	1.03	2.37	-0.28	1.06	3.47
	(0.3306)	(0.4922)	(0.9327)	(0.7100)	(0.2979)
Tender	12.53***	14.39***	12.37***	13.32***	16.04***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Attitude	-2.71	-2.38	0.40	1.48	1.38
	(0.4337)	(0.4239)	(0.8940)	(0.5878)	(0.6325)
Pooling	5.40***	5.10*	7.23***	4.97**	9.03***
	(0.0079)	(0.0576)	(0.0084)	(0.0395)	(0.0013)
Medium	-1.16	-0.95	-2.07	0.39	0.03
	(0.7119)	(0.5101)	(0.1570)	(0.7529)	(0.9801)
Sales Growth	0.35	0.29	0.55	0.36	0.36
	(0.2168)	(0.2645)	(0.2842)	(0.2581)	(0.4139)
Market-to-Book	0.05	0.17	0.19	0.12	-0.08
	(0.9283)	(0.4583)	(0.4372)	(0.4315)	(0.7004)
Target Size	-2.71***	-1.96**	-1.89**	-1.54**	-1.58*
	(0.0082)	(0.0151)	(0.0400)	(0.0335)	(0.0554)
Relative Size	-2.48***	-2.74***	-2.53***	-3.51***	-4.27***
	(0.0002)	(0.0045)	(0.0066)	(0.0044)	(0.0005)
N	1170	1122	968	1469	1578
Adj R-Square	0.0788	0.1050	0.1066	0.0787	0.0777

Table 5 (Cont'd)

Regressions on Bid Premium, BCAR, and TCAR

Panel B. Bidder Cumulative Abnormal Returns (BCAR)

	1	2	3	4	5
Intercept	0.03**	0.04**	0.04*	0.01	-0.004
	(0.0492)	(0.0202)	(0.0626)	(0.5368)	(0.8101)
COV	-0.002***				
	(0.0075)				
ERR		0.01			
		(0.2217)			
DISP			0.15*		
			(0.0609)		
SPREAD				0.13*	
				(0.0641)	
INDEX					0.03***
					(0.0015)
Conglomerate	-0.003	-0.004	-0.005	-0.005	-0.006
	(0.6862)	(0.5597)	(0.4869)	(0.3592)	(0.2140)
Toehold	0.004	0.001	0.002	0.006	0.006
	(0.6314)	(0.9442)	(0.8520)	(0.3814)	(0.3176)
Competition	0.02**	0.01**	0.02*	0.03**	0.02***
	(0.0232)	(0.0499)	(0.0571)	(0.0183)	(0.0081)
Tender	0.01*	0.01	0.01	0.01	0.01
	(0.0969)	(0.1602)	(0.1723)	(0.1927)	(0.1017)
Attitude	0.003	0.004	0.004	-0.006	-0.004
	(0.7480)	(0.6825)	(0.7153)	(0.4884)	(0.6111)
Pooling	-0.004	-0.003	0.001	0.0005	0.001
	(0.6845)	(0.7413)	(0.9304)	(0.9543)	(0.8902)
Medium	-0.01**	-0.01***	-0.02***	-0.01***	-0.01***
	(0.0109)	(0.0068)	(0.0014)	(0.0034)	(0.0005)
Sales Growth	-0.004***	-0.003***	-0.003***	-0.004***	-0.003***
	(0.0017)	(0.0014)	(0.0012)	(<.0001)	(0.0026)
Market-to-Book	-0.001**	-0.001**	-0.001*	-0.0001	-0.0003
	(0.0427)	(0.0134)	(0.0503)	(0.8443)	(0.6096)
Target Size	-0.01*	-0.01***	-0.01**	-0.005**	-0.003
	(0.0594)	(0.0025)	(0.0267)	(0.0447)	(0.1039)
Relative Size	-0.01	-0.01	-0.01	-0.02	-0.01
	(0.3289)	(0.2633)	(0.2137)	(0.1130)	(0.2112)
Premium	0.0001	0.0001	0.00002	0.00002	0.00003
	(0.5386)	(0.3909)	(0.8481)	(0.7888)	(0.7423)
N	872	835	712	996	1078
Adj R-Square	0.0598	0.0535	0.0568	0.0519	0.0543

Table 5 (Cont'd)
Regressions on Bid Premium, BCAR, and TCAR

Panel C. Target Cumulative Abnormal Returns (TCAR)

	1	2	3	4	5
Intercept	0.40***	0.34***	0.25***	0.37***	0.28***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
COV	-0.001				
	(0.2346)				
ERR		0.07**			
		(0.0362)			
DISP			2.20		
			(0.1454)		
SPREAD				0.33*	
				(0.0990)	
INDEX					0.12***
					(0.0028)
Conglomerate	0.01	0.01	0.01	0.01	0.02
	(0.2834)	(0.3101)	(0.3347)	(0.2532)	(0.1765)
Toehold	-0.02	-0.04*	-0.05**	-0.05**	-0.05**
	(0.3087)	(0.0933)	(0.0566)	(0.0180)	(0.0151)
Competition	-0.09***	-0.07***	-0.09***	-0.09***	-0.09***
	(<.0001)	(0.0021)	(<.0001)	(<.0001)	(<.0001)
Tender	0.06***	0.06**	0.05**	0.04**	0.04***
	(0.0006)	(0.0018)	(0.0234)	(0.0134)	(0.0069)
Attitude	0.003	0.03	0.03	0.02	0.02
	(0.8804)	(0.1610)	(0.1306)	(0.3049)	(0.2042)
Pooling	0.01	0.03	0.02	0.02	0.02
	(0.5479)	(0.1436)	(0.4132)	(0.3205)	(0.2572)
Medium	-0.04***	-0.04***	-0.04***	-0.04***	-0.04***
	(0.0002)	(0.0002)	(0.0003)	(<.0001)	(<.0001)
Sales Growth	0.002	0.002	0.005	0.001	0.005
	(0.5751)	(0.6521)	(0.2043)	(0.6698)	(0.1966)
Market-to-Book	-0.0002	-0.001	-0.001	0.0004	0.0003
	(0.8900)	(0.4682)	(0.3568)	(0.9998)	(0.7854)
Target Size	-0.006	-0.002	-0.003	-0.001	0.004
	(0.3000)	(0.7372)	(0.6220)	(0.9016)	(0.4989)
Relative Size	-0.003	-0.002	-0.005	-0.003	-0.003
	(0.6313)	(0.7849)	(0.4328)	(0.5924)	(0.6600)
ResPremium	0.003***	0.004***	0.003***	0.004***	0.004***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
N	910	858	716	1139	1276
Adj R-Square	0.3081	0.3455	0.3205	0.3532	0.3355

Table 6
Sorting based on Information Asymmetry Proxy, INDEX

This table presents the 2 decile bidding premium sorted by information asymmetry INDEX. In Panel A, the sample is divided into three groups according to the target year-end market value of common equity in the year before takeover announcement. In Panel B, the sample is divided into three groups according to the bidder year-end market value of common equity in the year before takeover announcement. In Panel C, the sample is divided into three groups according to the relative size of the target year-end market value of common equity to that of the bidder in the year before takeover announcement. In Panel D, the sample is divided into three groups according to the payment method in takeovers-pure cash offer, mixture offer, and pure stock offer. P values are reported in parentheses. Significance at the 10%, 5%, and 1% level is noted by *, **, and ***, respectively.

Panel A. Bid premium

	Payment Method			Bidder Size			Target Size			Relative Size		
	CASH	MIXTURE	STOCK	SMALL	MEDIUM	BIG	SMALL	MEDIUM	BIG	SMALL	MEDIUM	BIG
Low	40.26***	36.75***	37.56***	35.13***	32.70***	42.58***	40.42***	41.95***	34.89***	44.86***	39.25***	28.36***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(0.0032)	(<.0001)	(<.0001)
High	45.52***	44.65***	44.18***	43.08***	45.19***	45.06***	49.38***	43.89***	39.11***	53.43***	39.56***	37.81***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
High –	5.26*	7.90**	6.62**	7.94**	12.49***	2.49	8.96**	1.94	4.22	8.57**	0.31	9.45***
Low	(0.0970)	(0.0370)	(0.0217)	(0.0118)	(<.0001)	(0.4114)	(0.0110)	(0.5576)	(0.1264)	(0.0112)	(0.9102)	(0.0011)

Panel B. Bidder abnormal return

	Payment Method			Bidder Size			Target Size			Relative Size		
	CASH	MIXTURE	STOCK	SMALL	MEDIUM	BIG	SMALL	MEDIUM	BIG	SMALL	MEDIUM	BIG
Low	0.0003	-0.022***	-0.038***	-0.027***	-0.023***	-0.02***	-0.01***	-0.023***	-	-0.009***	-0.023***	-0.037***
	(0.1225)	(0.0053)	(<.0001)	(0.0003)	(<.0001)	(<.0001)	(0.0085)	(0.0002)	0.019***	(0.0032)	(<.0001)	(<.0001)
									(0.0003)			
High	0.0105***	-0.004	-0.016***	0.0045	0.0002	-0.008*	0.0033	-0.001	-0.004	0.0013	-0.003	-0.007
	(0.0009)	(0.1535)	(0.0091)	(0.5151)	(0.9688)	(0.0531)	(0.6330)	(0.6919)	(0.2815)	(0.7099)	(0.5488)	(0.3826)
High –	0.01**	0.018**	0.022***	0.032***	0.023***	0.012**	0.014**	0.022***	0.015**	0.01**	0.02***	0.03***
Low	(0.0349)	(0.0205)	(0.0076)	(0.0019)	(0.0004)	(0.0407)	(0.0401)	(0.0086)	(0.0312)	(0.0269)	(0.0045)	(0.0042)

Panel C. Target abnormal return

	Payment Method			Bidder Size			Target Size			Relative Size		
	CASH	MIXTURE	STOCK	SMALL	MEDIUM	BIG	SMALL	MEDIUM	BIG	SMALL	MEDIUM	BIG
Low	0.23***	0.18***	0.16***	0.17***	0.16***	0.22***	0.19***	0.20***	0.19***	0.24***	0.20***	0.13***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
High	0.29***	0.24***	0.20***	0.21***	0.23***	0.27***	0.26***	0.24***	0.20***	0.30***	0.23***	0.17***
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
High -	0.054**	0.059*	0.036*	0.04*	0.065***	0.057**	0.07***	0.04	0.01	0.062**	0.026	0.042**
Low	(0.0271)	(0.0667)	(0.0652)	(0.0595)	(0.0015)	(0.0242)	(0.0050)	(0.1134)	(0.6173)	(0.0270)	(0.2148)	(0.0161)

Table 7
Robustness tests of determinants of the Bid Premium and Firm Abnormal Returns

This table provides the robustness test of the relation between information asymmetry measured with INDEX and bid premium and firm announcement abnormal returns. The sample is divided into three groups according to the payment method in takeovers- pure cash offer, mixture offer, and pure stock offer. Variable definitions are reported in table 2. Significance is based on White-adjusted standard errors with *p*-values reported in parentheses. Significance at the 10%, 5%, and 1% level is noted by *, **, and ***, respectively.

	Bid Premium			BCAR			TCAR		
	pure cash	mixture	pure stock	pure cash	mixture	pure stock	pure cash	mixture	pure stock
Intercept	31.76**	32.12**	54.15***	-0.02	-0.02	-0.06*	0.25***	0.18**	0.14**
	(0.0142)	(0.0125)	(<.0001)	(0.4228)	(0.7419)	(0.0527)	(0.0046)	(0.0483)	(0.0162)
INDEX	8.31	18.04**	10.57*	0.037**	0.021	0.055**	0.127**	0.139**	0.093*
	(0.1232)	(0.0190)	(0.0857)	(0.0176)	(0.4500)	(0.0371)	(0.0214)	(0.0277)	(0.0600)
Conglomerate	-2.13	3.17	4.57	-0.002	-0.01	-0.02*	0.02	0.02	0.01
	(0.5730)	(0.3231)	(0.1171)	(0.8058)	(0.6189)	(0.0564)	(0.3283)	(0.3615)	(0.7255)
Toehold	-14.65***	-21.88***	-21.81***	-0.006	0.04***	0.02	-0.08***	0.02	-0.17***
	(0.0004)	(<.0001)	(<.0001)	(0.4953)	(<.0001)	(0.1983)	(0.0075)	(0.6927)	(0.0009)
Competition	10.65*	2.42	-8.46**	-0.01	0.03*	0.04**	-0.14***	-0.09***	-0.02
	(0.0556)	(0.6825)	(0.0423)	(0.1892)	(0.0939)	(0.0172)	(<.0001)	(0.0007)	(0.4585)
Tender	13.76***	20.85***	9.23	0.002	0.03**	0.001	0.03	0.06**	0.12**
	(<.0001)	(<.0001)	(0.2368)	(0.7370)	(0.0410)	(0.9732)	(0.2450)	(0.0199)	(0.0246)
Attitude	-7.70*	5.35	11.63	-0.01	0.01	0.007	0.06**	-0.03	0.03
	(0.0546)	(0.2838)	(0.1328)	(0.1623)	(0.6487)	(0.5990)	(0.0327)	(0.2879)	(0.4817)
Pooling	N/A	12.11	5.83**	N/A	-0.03	0.01	N/A	0.05	0.01
		(0.1874)	(0.0386)		(0.1689)	(0.2910)		(0.6068)	(0.4138)
Sales Growth	-0.55	0.56	0.68	-0.0006	-0.01	-0.002	0.02***	-0.003	0.02***
	(0.4476)	(0.3635)	(0.6422)	(0.6891)	(0.4456)	(0.6992)	(<.0001)	(0.2226)	(0.0030)
Market-to-Book	-0.21	-0.10	-0.02	0.0003	0.001	-0.0005	0.0001	0.002	-0.002
	(0.6183)	(0.6736)	(0.9643)	(0.7310)	(0.2228)	(0.6888)	(0.9832)	(0.2060)	(0.3122)
Target Size	-0.97	-1.82	-2.84**	0.0003	-0.004	-0.004	0.01	0.004	-0.0002
	(0.5535)	(0.1969)	(0.0219)	(0.9241)	(0.4859)	(0.2284)	(0.3554)	(0.7306)	(0.9816)
Relative Size	-1.51	-5.48**	-7.02**	0.008**	-0.04	-0.01*	0.004	-0.008	-0.03*
	(0.2034)	(0.0487)	(0.0156)	(0.0440)	(0.1435)	(0.0982)	(0.5991)	(0.3958)	(0.0540)
Premium/ResPremium				0.0003***	-0.0001	-0.0001	0.004***	0.004***	0.003***
				(0.0006)	(0.5975)	(0.5985)	(<.0001)	(<.0001)	(<.0001)

N	544	428	606	383	285	410	433	357	486
Adj R-Square	0.1025	0.1142	0.0529	0.0419	0.1191	0.0306	0.3221	0.3334	0.3266