Investor Attention and Early Announcements in Mergers and Acquisitions

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Abstract

By focusing on mergers and acquisitions (M&As) with the public announcement dates before the definitive agreements, we find that acquiring firms tend to have higher abnormal trading volume and abnormal Google search volume, which indicates higher investors' attention. The early announced takeovers combined with excessive investor attention are associated with higher short-term abnormal returns, which are reserved in the long-term. The high investor attention on early announced deals are more likely to reduce the deal competition probability. Collectively, our findings support the price pressure hypothesis that increased investor attention causes temporary price run-ups at the early announcement date to frighten the competing bidders.

Keywords: Mergers and acquisitions; Investor attention; Early announcement
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1. Introduction

Why do firms make an early announcement of Mergers and Acquisitions (M&A)? One explanation is the "announce-to-signal" target shareholders' high synergies to overcome negotiation frictions and improve success rates (Aktas *et al.* 2018). We focus on another explanation, attracting attention. M&A deals attract considerable attention from investors, media, and financial analysts. Previous studies show that the pricing effect of new information on various other issues could be escalated by the magnitude of investor attention in stock markets (Barber and Odean, 2008; Da, Engelberg, and Gao, 2011). To our knowledge, this is the first paper studying investor attention in the context of early announcements of mergers and acquisitions. We show early announcements increase investor attention. Excessive investor attention to early announcements can lead to a higher short-term firm value but eventually be reversed in the long run. Then we study whether deals with early announcements attracting large attention are attractive in the M&A market in terms of competing bids. We find early announcements with high attention reduce the probability of competing bids.

Investor attention influences the market reaction to firms' events through two channels: the price pressure hypothesis (Barber and Odean, 2008) and the price discovery hypothesis (Hirshleifer and Teoh, 2003). According to the price pressure hypothesis, increased investor attention causes temporary price run-ups around attention-grabbing events, due to investor psychological biases and introducing inefficiencies in the market. According to the price discovery hypothesis, increased investor attention improves market efficiency by leading to more informed responses to the disclosure of new information. In the context of early announcements, we will

test the two competing hypotheses. Early announcements of takeovers may be attention-grabbing events as they are unexpected and can reveal valid signals. We first test if early announcement deals are associated with higher levels of investor attention and show they do. Then we test for the two competing hypotheses regarding investor attention. If the price pressure hypothesis holds, we expect increased attention on early announced deals leads to a short-term valuation premium and a price reversal in the long run. In contrast, if the price discovery hypothesis holds, we expect that increased attention on early announced deals causes both short-term and long-term positive returns. We also study the impact of increased investor attention due to early announcements on the deal competition. In the price pressure hypothesis, the short-term valuation premium is caused by investor overreacting, which overestimates the deal quality and attractiveness. Thus, early announced deals with high attention are less competitive in the market because the short-term premium will disappear in the long run. However, if the price discovery hypothesis holds, excessive investor attention increases the discovery of deal quality, which in turn improves deal competition in the public stage. As a result, we would expect early announcements with high attention are associated with a higher probability of competitive bids in the hypothesis.

We first examine the magnitude of investor attention around early announcements by using manually collected data on the google search volume index (*AbSVI)* and the abnormal dollar trading volume (*AbVOL)*. Next, we explore the relationship between investor attention around early announced deals and abnormal returns. To accommodate the possible endogeneity caused by the bidder firm's decision to announce early, we employ the Heckman-two stage model (1979) and Propensity Score Matching analysis (PSM) in our analysis. We find early announced

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deals with high attention are associated with higher returns in the short run up to 6% over a three-day window and experience a price reversal in the long run up to -26% over a two-year window. Our results are in line with the price pressure hypothesis (Barber and Odean,2008) that concludes that attention-grabbing events have a temporary valuation premium and price reversal over a longer horizon. We find that the early announced deals are related to a lower probability of competitive bids for those deals that attract more attention. This evidence further supports the price pressure hypothesis that short-term mispricing is caused by the investor overreacting and market inefficiency. In fact, early announced deals with high attention are less competitive in the market.

One recent paper most closely related to our work is by Aktas *et al.* (2018) who report that early announced bidder firms are engaging in value-created deals and earn positive announcement returns. our results are different from them by showing that investors pay higher attention to early announcements in takeovers. Understanding how investor attention influences the market response to the early announcement is important. Prior literature shows that announcement returns could be biased due to price pressure around mergers and acquisitions (Louis and Sun, 2010; Barbopoulos *et al.* 2020), yet the issue has not been investigated before for early announcements that are not compulsory so the firm should have an intrinsic incentive to do so. Prior literature provides evidence that investor attention is an important factor in determining the stock price (e.g., Gervais, Kaniel, and Mingelgrin, 2001; Barber and Odean,2008; DellaVigna and Pollet,2009; Da, Engelberg, and Gao,2011; Hou, Peng, and Xiong,2009; Hirshleifer *et al.* 2009), yet this is the first study providing evidence on early announcements.

The remainder of this paper proceeds as follows. Section 2 reviews the relevant literature and develops hypotheses. Section 3 describes the sample, data, and methodology. Section 4 presents main results and Section 5 reports the robustness analysis. Section 6 concludes.

2. Literature review and hypothesis development

The growing literature on investor attention in financial markets rests on two competing hypotheses. Barber and Odean (2008) argue that attention has an important role in investors' buying decisions as investors do not have the time and resources to search through all stocks until they find a good target. Attention is a limited cognitive resource (Kahneman,1973), and investors typically buy stocks that grab their attention. In contrast, when selling stocks, investors only consider the limited number of stocks they already hold and this asymmetry causes investors to be on average net buyers of attention-grabbing stocks, thus leading a positive price pressure and short-term mispricing. Empirical evidence is provided for price pressure by many authors. Lee (1992) shows small traders persistently purchase stocks when firms have significant events, regardless of the direction of events. Gervais, Kaniel, and Mingelgrin (2001) find that abnormal trading volume increases stock visibility and investor attention, resulting in a subsequent price increase. In more recent work, Da, Engelberg and Gao (2011) find that an increase in investor attention measured by google search volume can predict higher stock returns in the next two weeks and a price reversal within a year. Luo (2014) shows that increasing advertising spending is associated with a contemporaneous rise in retail buying orders and abnormal stock returns, although the price effect is eventually reversal in the long run.

On the other hand, Hirshleifer and Teoh (2003) develop a model that shows limited investor attention reduces the price discovery and market efficiency. Consistent with this premise, DellaVigna and Pollet (2009) argue that limited investor attention influences stock prices because lower attention causes investors to take a longer time to react to market information. Their empirical evidence shows that earning announcements made on Fridays (lower investor attention) have a delayed market response and stronger post-announcement drifts. Hou, Peng, and Xiong (2009) use trading volume as a measure of investor attention and find that lower attention leads to more post-earnings announcement drifts. Drake *et al.* (2012) provide empirical supports for this channel in a setting of M&A, which shows that increased investor attention causes a higher trading volume and faster information acquisition process around M&A announcements, reflecting deal quality more accurately.

Previous literature uses mainly two proxies for investor attention. One is the trading volume, mainly during the period of direct measurement via internet search engines were not available. Hou, Peng, and Xiong (2009) document that trading volume can reflect investor attention since investors have to pay attention to the stock when they actively trade it. Lo and Wang (2000) provide empirical evidence that trading volume is higher among stocks which tend to attract investor attention. Chordia and Swaminathan (2000) show that trading volume can capture more attention which is not captured by firm size. By employing abnormal daily trading volume, Barber and Odean (2008) investigate the change in investor attention to the stock.

Recently, Da, Engelberg, and Gao (2011) argue that google search volume index (SVI) can directly capture the magnitude of investor attention, in particular,

retail investor attention. Given the increasing usage of internet technologies, it is common to use an internet search engine to gather information nowadays, and google is one of the most popular and prominent tools[1]. More importantly, the authors argue that the SVI is a revealed attention measure; when people search for a stock in google, they must be paying attention to this stock. For example, Da, Engelberg, and Gao (2011) firstly show that as a proxy of individual investor attention, higher weekly google SVI can predict higher stock returns in the short run and a reversal in the long run. In the study of earnings announcement and investor attention, Drake *et al.* (2012) find that abnormal google search volume sharply increases at the earnings announcement and is associated with higher announcement returns. Similarly, in the earnings announcement literature, as a proxy of investor attention, the SVI is employed by DeHaan *et al.* (2015) to examine whether managers strategically report negative (positive) earnings news when attention level is lower (higher).

Investor attention is central to mergers and acquisitions. Lou (2014) reports that managers opportunistically boost advertising spending in the contemporaneous year when the M&A transaction is stock-financed, and such behaviors essentially pump up bidder stock prices. Reyes (2018) directly examines the relationship between merger announcements and investor attention. His empirical evidence shows that abnormal attention with great news coverages leads to a higher announcement abnormal return for bidders. Barbopoulos *et al.* (2020) find that small acquisitions announced on the day of the release of macroeconomic news attract relatively high marker attention and realize a positive announcement return and a small price drift in the long run. This evidence supports the price pressure hypothesis of investor

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[1] Source: http://www.ebizmba.com/articles/search-engines

attention in takeover markets. Louis and Sun (2010) test the effect of inattention on

merger announcement and find M&A announcements made on Friday (lower

investor attention) present a lower abnormal trading volume and less pronounced

negative returns for stock swap acquisitions.

For most of M&As, bidders and targets will issue a press release announcing

the deal and describing the material terms of the transaction once they sign the

definitive merger agreements. This public disclosure of material information is

mandated by U.S. security laws with the purpose of protecting investors' interests and

improving market transparency[2]. However, with regard to the timing of deal public

announcements, there is room for discretion. Bidders' managers can choose to

voluntarily announce relevant information of the negotiation at an earlier stage, ahead

of definitive agreements being signed. These early announcements can be disclosed

before the formal due diligence process or during the negotiation period of a

transaction agreement. Generally, the early announcement is much more unexpected

and difficult to process in terms of information content than regular mergers and

acquisition announcements. Moreover, Aktas *et al.* (2019) report that early

announcements can be a valid signal and convey important information to the market.

As a result, early announcements would be attractive to investors and cause them to

pay much attention to this unscheduled and unexpected corporate event. Therefore,

we construct the first hypothesis as follows:

H₁: Bidder early announcements are associated with higher investor attention.

We next examine how investor attention influences market reaction to the

early announcement of mergers and acquisitions. According to the price pressure

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[2] For detailed mandate on M&A deal disclosure, see U.S. Securities Exchange Act (Rule 10b-5,
Exchange Act) about M&A press release.

hypothesis, increased attention could cause positive returns around early takeover announcements in the short run and return reversal in the long run leading to:

H$_{2a}$: Early announcements with high attention are associated with higher short-term returns and lower long-term returns.

According to the price discovery hypothesis, higher abnormal investor attention could cause faster information discovery of the synergies as in Aktas *et al.*(2018) reports. Therefore, we would expect increased attention due to early announcements would yield a positive short-term premium that does not disappear in the long run:

H$_{2b}$: Early announcements with high attention are associated with both higher short-term and long-term returns.

Finally, increased attention to early announcements might have different impacts on the public deal competition. As in the price pressure hypothesis, early announced deals with high attention might experience a price reversal in the long run because their short-term valuation premium might be caused by market mispricing. As a result, long-term price reversal suggests that this type of early announced deals may not be high-quality. Relative to individual investors, other potential acquirers are more informative and know the private information of deal quality. For other competitive acquirers, they would not engage in early announced deals with high attention as the deal quality is overvalued and lower. This leads to the following hypothesis:

H$_{3a}$: Early announcements with high attention reduce deal competition in the public phase.

Alternatively, in a setting of price discovery hypothesis, abnormal attention on early announced deals increase the market efficiency, and long-term valuation

premium would not be reversed. It suggests that increased attention on early announced deals might accelerate the finding of deal quality. These deals should be more attractive for potential acquirers and thus improve deal competition in the public stage. It predicts:

H$_{3b}$: Early announcements with high attention increase deal competition in the public phase.

3. Data and Methods

3.1 Deal sample selection

Our deal sample is from Thomson Financial SDC Mergers and Acquisitions Database (both completed and uncompleted). Our data period starts in 2005 when the Google Trends begins to provide data on google searches in 2004 and ends on December 31 2018. We require a deal to satisfy the following selection criteria:

(1) both bidders and targets are publicly listed firms in NYSE, AMEX, and NASDAQ;

(2) we exclude transactions involving spinoff, repurchase, self-tenders, recapitalizations, going privatizations, liquidations, exchange offers, acquisitions of remaining interest, and partial interest or assets, following similar filters of Aktas *et al.* (2018);

(3) the deal value reported in SDC is equal to or more than $10 million;

(4) bidders control at least 50% of the target shares after the transaction;

(5) bidders have stock price data from CRSP and accounting data from Compustat, which yields 1302 acquisition announcements.

As the proprietary definition of bidder pre-announcement of a deal is critical to our study, we handly check the data about the takeover announcement information from the SEC filings and SDC reported announcement dates. We define the early

announcement of bidder firms as a dummy variable (Early) equals to one if the SDC reported deal announcement date is prior to the definitive agreement date in SEC filings, and zero otherwise. We identify 65 early announcements. We further require the gap between the early announcement date and definitive agreement date to be over 3 days to avoid any early disclosure that is announced at the weekend or public holidays, while the definitive agreement is signed on the next working day. This procedure reduces one deal and the final sample consists of 64 early announced deals in a total of 1302 deals during the sample period.

Table 1 reports the industry distribution of bidder firms that made early announcements whereby the industry classification is based on the bidder firms' SIC codes and follows the definitions of Fama-French 12 industries. Panel A shows that the Business and Equipment industry has the largest number (i.e., 14) of early announcement deals, compared with the other 11 industries. Panel B of Table 1 shows that the early announcement deals account for 4.92% of total deals in this sample. This small proportion of early announcement deals is similar to Aktas *et al.* (2018) that shows 6.67% takeovers with early disclosure by focusing on a sample from 1990 to 2013. After 2004, their early announcement sample ratio is lower at 3.4%. Panel C shows that the difference of mean(median) days between the early announcement and late definitive agreement announcement is about 75 (55) days. These figures are similar to Aktas *et al.* (2018)'s 80 (55) days.

*****insert table 1 here*****

3.2 Measuring abnormal investor attention

To capture abnormal investor attention paid to early announcements, we use search frequency data from Google Trends (Search Volume Index (SVI)), which starts to provide information from January 2004. The Search Volume Index is

designed by google to report how often particular search terms entered in the google search engine over a specific period. An innovative work by Da, Engelberg, and Gao (2011) argues that google search volume is a proprietary proxy for investor attention for the following reasons. Firstly, as a market-leading internet search platform, search volume from google is likely to reflect search behaviors of general people. Secondly, people searching stocks in google means that they must pay active attention to these shares. Following Da, Engelberg, and Gao (2011), we focus on the google search volume for stock tickers since using the company business name can be problematic. People who search a company name are likely to be motivated by more reasons than non-investing purposes. The business name has variations that are hard to capture. To obtain a more precise and investment-based search volume, we identify a stock using its stock ticker during the sample period. Following Drake *et al.* (2012), we define the daily abnormal attention from the google search as follows:

$$AbSVI_{i,t} = \frac{SVI_{i,t} - ASVI_{i,t}}{ASVI_{i,t}} \qquad (1)$$

where $SVI_{i,t}$ is the value of daily SVI for a firm i on day t; $ASVI$ is the average same-day SVI of the week for the firm i over the past 10 weeks. To normalize distribution, we use the natural logarithm of 1+$AbSVI$. The $AbSVI$ indicates that the difference between a stock ticker's daily SVI and its average same-day SVI of the past ten weeks, scaled by the average. To avoid weekday and any seasonal effects, we estimate the past ten-week same day average of SVI. Overall, $AbSVI$ is designed to account for deviations of investor attention from within-firm and weekday benchmarks.

  Alternatively, as a traditional proxy of investor attention, we use trading volume which is widely adopted in prior literature, especially before google search

data was not available (Hou, Peng, and Xiong,2009; Chordia and

Swaminathan,2000; Barber and Odean ,2008). This makes our analysis comparable

to past literature and we estimate the abnormal trading volume using a similar

procedure for firm i on date t as:

$$AbVOL_{i,t} = \frac{VOL_{i,t} - AVOL_{i,t}}{AVOL_{i,t}} \qquad (2)$$

where $VOL_{i,t}$ is the dollar trading volume for a firm i on day t; $AbVOL$ is the

average same-day dollar trading volume of the week for the firm i over the past 10

weeks. To normalize distribution, we use the natural logarithm of 1+$AbVOL$.

3.3 Measuring bidder returns

We estimate abnormal returns around the early announcement over a three-

day event window ($CAR(-1,+1)$) using the market model with the parameters

estimated over the period starting 205 days and ending 6 days prior to the event date

with the benchmark portfolio CRSP value-weighted index. Following Aktas *et al.*

(2018), we also estimate the combined bidder announcement returns (*Combined

CAR(-1,1)*) as the sum of early announcement CARs and agreement announcement

CARs for early announced deals, and as the agreement announcement CARs for

others.

Following Barber and Lyon (1997), we use one of the most common methods

of evaluating long-run wealth effects of takeovers: buy-and-hold abnormal returns

(BHAR). The model 5 presents the BHAR estimations as follows :

$$BHAR_{i,t} = \prod_t^T (1 + R_{it}) - \prod_t^T (1 + R_{pt}) \qquad (3)$$

where R_{it} is the return of the bidder firm and R_{pt} is the return of the benchmark

portfolio on the month t; T is the holding period. Following Hirshleifer *et al.* (2009),

we compute R_{pt} using a five by five size and book-to-market matched portfolio

based on the market capitalization at the end of June and book value of equity for the

last fiscal year-end in the prior year divided by the market value of equity for December in the prior year. The holding period of BHAR is a period of up to 24 months following the month of the first announcement that is the early announcement for early announced deals and M&A agreement announcement for other deals.

3.4 Other control variables and descriptive statistics

We use a set of control variables related to bidder announcement returns. Firm size has a negative effect on bidder's announcement returns (Moeller, Schlingemann, and Stulz,2004). We define firm size (*Size*) as the natural logarithm of total assets. Bidder leverage has a positive impact on bidder returns (Maloney *et al.* 1993). We define the leverage (*Leverage*) as the book value of debt divided by the market value of total assets. Bidder firms with higher book-to-market ratio are associated with higher announcement returns (Dong *et al.*2006). The book-to-market ratio (*BTM*) is defined as the book value of equity to the market value of equity. Moller *et al.* (2007) show that bidder firms with high sigma (idiosyncratic volatility) acquire lower announcement returns in stock acquisitions. The bidder sigma (*Sigma*) is calculated as the standard deviation of the bidder firm's market-adjusted daily returns from CRSP over the period starting at 205 and ending 6 days prior to the announcement day. In addition, prior evidence suggests that bidder firms experience negative announcement returns when the bidder firms have price run-up (Rosen, 2006). We control the bidder firm's run-up(*Run up*) which is defined as the buy-and-hold returns for firms' stock over the period starting at 205 and ending 6 days prior to the announcement day. We also include corresponding target firms' characteristics into the analysis.

Secondly, we control for deal characteristics. Prior studies generally argue that bidder returns are negatively related to stock-financed acquisitions and positively related to the cash payment.[3] To control for the effect of method of payment, we include a dummy variable (*Stock*) that equals 1 if the deal is fully paid in stock, and zero otherwise. Maquieira *et al.* (1998) suggest that diversifying is important to the generation of merger wealth. We define diversification (*Diversify*) as an indicator variable that equals 1 when the bidder and target are not from the same Fama–French 48-industry classification group, and zero otherwise. Jensen and Ruback (1983) show that tender offer is positively associated with bidder returns. To control this effect, we use a dummy variable (*Tende*r) that takes the value 1 if the form of deal is a tender offer, and zero otherwise. Additionally, bidder firms operating in the high-tech industry show a negative effect on returns (Masulis *et al.* 2007). We use a dummy variable (*HighTech*) which equals to 1 if both bidder and target firms are from high-tech industries defined by Loughran and Ritter (2004). Prior evidence suggests that bidder announcement returns are negatively related to the relative size of target firms when bidder firms engage in public targets (Fuller *et al.* 2002). The relative size (*Relative size*) is defined as the deal size reported from SDC divided by the bidder firm's market value of equity 4 weeks prior to the announcement day. All variable definitions can be found in Appendix 1.

Table 2 presents the descriptive statistics of our deal sample. Of all mergers and acquisitions, during the research period, 4.9% are identified as the early announcement deals. The mean abnormal volume (*AbVOL*) is 2.65 indicating that both deal announcements and early announcements days have a higher trading volume than the normal day, while the mean abnormal google search index (*AbSVI*)

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[3] See, for example, Travlos (1987), Lang *et al.* (1989), Chang (1998), and Fuller *et al.* (2002).

is 0.937. The average deal value is \$2.96 billion and 23% of all deals are fully paid by stock and 29% of bidders engage in diversified transactions, while 9.4% of deals are in the high-tech industry and tender offers account for 15% of the sample. The mean (median) size of bidder firms is \$26.79 billion (\$5.87 billion), while the target firm size is smaller with mean (median) value of \$3.28 billion (\$0.82 billion). The average leverage of 14.8% (14.4%) and the book-to-market ratio of 0.50(0.59) for bidder (target) firms are similar. The mean sigma is 0.02 for bidder firms, while 0.03 is for target firms. Bidder firms show a higher average run-up (5.3%), compared with the target firms' run-up (3.6%).

*****insert table 2 here*****

3.5 Emprical methods

Our empirical analysis first examines the relation between early announcements and abnormal investor attention. Following Drake *et al.* (2012), we test hypothesis 1 by using the full time-series of daily sample of stock data and google search data for our deal sample. Specifically, we use the following model:

$$AbVOL_{it} \ (AbSVI_{it}) = \ \beta_1 Early_{it} + \beta_2 DealAnn_{it} + \beta_3 Bidder \ Size_{it} +$$
$$\beta_4 Bidder \ Leverage_{it} \ + \ \beta_5 Bidder \ BTM_{it} + \beta_6 Analyst_{it} +$$
$$+\beta_7 InstOwn_{it} + \ \beta_8 Raw \ Return_{it} + \gamma_{\ i} + \delta_{\ t} + \varepsilon_{it} \quad (4)$$

Outcome variables, *AbVOL* and *AbSVI*, are our two proxies for abnormal investor attention, which are defined in equation 1 and 2. Our main interest of variable is the early announcement dummy variable (*Early*). Additionally, we control for firm M&A agreement announcements (*DealAnn*) which equal one if bidder firms make agreement announcements in a given day, and zero otherwise. We include firm's analyst coverage (*Analyst*) which is defined as the natural log of 1 plus the

number of analysts providing earnings forecast for bidder firms at the end of last fiscal quarter. We also include the variable (*InstOwn*) to control for institutional ownership, which may influence investor attention and is calculated as the ratio of bidder firm's shares holding by institutional investors to total shares outstanding. Daily raw returns (*Raw return*) are also included. Other firm-level characteristics including, *Size*, *Leverage,* and *BTM ratio*, are included because these important factors may affect investor attention. γ_i indicates the firm fixed effects which capture the time-invariant differences in investor attention; δ_t denotes the year, month, and day-of-week fixed effects; ε_{it} indicates error terms.

Our second part of empirical analysis focuses on the stock market reaction to early announcements with abnormal investor attention. To test hypothesis 2, we employ our cross-sectional deal sample. Build on the work of Aktas *et al.* (2018), we construct the following OLS regression model:

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\begin{aligned}
CAR\ (BHAR) = {} & \beta_1 Early + \beta_2 (Early \times HighAtt) + \beta_3\ HighAtt \\
& + \beta_4 Bidder\ Size + \beta_5 Bidder\ Leverage \\
& + \beta_6 Bidder\ BTM + \beta_7 Bidder\ Runup + \beta_8 Bidder\ Sigma \\
& + \beta_9 Target\ Size + \beta_{10} Target\ Leverage + \beta_{11} Target\ BTM \\
& + \beta_{12} Target\ Runup + \beta_{13} Target\ Sigma + \beta_{14} Stock \\
& + \beta_{15} Diversify + \beta_{16} HighTech + \beta_{17} Tender + \beta_{18} Relative\ Size \\
& + \varepsilon \quad\quad\quad\quad (5)
\end{aligned}
$$

where CAR is defined as a cumulative abnormal return over a three-day window as discussed early. BHAR is buy-and-hold abnormal returns that are used for evaluating firm's long-term performance, which is defined in equation 3. *HighAtt* is the indicator variable which equals to one if the abnormal trading volume *(AbVOL)* on

the first announcement day is the top quartile in the year, and zero otherwise. We include a set of control variables to ensure that what we capture in estimation is not driven by the fundamental firm and deal characteristics that are known to affect bidder CARs. All regressions include year and Fama-French 48 industry fixed effects. Standard errors are two-way clustered by the firm and industry level. Our interest of variable is the interaction term ($Early \times HighAtt$). Following hypothesis H_{2a}, we would expect that the coefficient of the interaction term is positive in the short-run and negative in the long-run. However, as predicted in H_{2b}, the coefficient of the interaction term is positive both in the short-term and long-term.

4. Results

In this section, we analyze the investor attention around early announcements and the stock market reaction to early announcements. We present both univariate and multivariate analyses.

4.1 Attention to early announcements

We examine the magnitude of investor attention to early announcements using two measures, abnormal trading volume and google search volume. Figure 1 plots the mean abnormal trading volume (*AbVOL*) from day -5 to day +5 of early announcements (day 0). We observe a sharp spike in the abnormal volume of trade on the day of early announcements, then followed by a decreased trend in the post-event period. In contrast, the average *AbVOL* of the randomly selected day does not exhibit any obvious trend during the whole window, although there is a small fluctuation around the value of 0. Figure 2 presents google search volume (*AbSVI*) around early announcements. The average value of *AbSVI* increases dramatically on the early disclosure day and peaks the next day of the early announcement, while the

AbSVI before and after the randomly selected day generally bounces around 0 throughout the entire period.

Taken together, these two measures of attention, abnormal trading volume and abnormal google search volume indicate that investors pay considerable attention to the bidders' early announcements. Prior literature generally finds that the M&A announcement is one type of attention-grabbing event since the investors demand information (Drake *et al*. 2012). We show that early announcements in takeovers also perform as attention-grabbing events. Our results in terms of attention are consistent with the finding of Aktas *et al*. (2018) that early announcements in takeovers are not a simple firm's disclosure without useful information to investors. We add to it showing that investors demand this information and pay close attention to the event.

*****insert figures 1 and 2 here*****

Next, we perform both the univariate analysis and multivariate analysis to examine the degree of investor attention around early announcements in takeovers. Table 3 presents these results.

In Panel A of Tables 3, it provides the univariate analysis of the investor attention on the early announcement day and quiet days (days without early announcements). Consistent with prior figure evidence, the early announcement day is associated with higher abnormal trading volume and abnormal google search volume, compared with quiet days. Specifically, we find that the average difference of abnormal trading volume between early announcement days and quiet days is 0.952, with a p-value smaller than 1%. The difference of google search volume between early announcement days and quiet days are, on average, 0.297, with a p-value smaller than 5%. This evidence suggests that on the early announcement day,

both abnormal trading volume and google search volume are significantly large than other normal days.

Panel B of Table 3 presents the estimation results for model 4. In column 1, the coefficient estimate for the early announcement (*Early*) is significantly positive at 1% level, which indicates that abnormal trading volume sharply increases by 0.92% on the early announcement day. In column 2, the positive relation between early announcements and abnormal trading volume remains significant after controlling firm fixed effects. It is notable that the coefficient of M&A agreement announcement (*DealAnn*) is also significant and positive, which supports prior literature that argues that investors pay close attention to the firm M&A announcements (Drake *et al.* 2012; Reyes,2018). Also, a higher abnormal trading volume reaction to the early announcement remains after controlling for the agreement announcement of the deal. In Columns 3 and 4, we report results when abnormal attention is measured by the google search volume (*AbSVI*). The coefficient estimate for google search volume is 0.225 for column 3, with a t-statistic of 3.5, indicating that investors increase the stock search by 0.225% on the early announcement day. We also find similar results in column 4 after controlling firm fixed effects.

Taken together, results reported in Table 3 support the first Hypothesis (H_1) that early announcements are associated with higher investor attention. Investors demand information from the early announcements in takeovers and pay much attention to this type of corporate disclosure.

*****insert table 3 here*****

4.2 Attention to early announcements and merger performance

As the initial step to investigate how the increased investor attention to the early announcements in takeovers affects merger performance, we compare the CARs

of early announced deals and non-early announced deals. Table 4 reports CARs for bidders at different groups.

In Panel A of Table 4, the first row presents the three-day abnormal returns (CAR-1,1) for bidders that do not make early announcements around the M&A agreement announcement as -0.96%, supporting prior literature finds that bidder firms engage in public deals are value-destroying for firms (Travlos, 1987; Fuller *et al.* 2002). The average bidder CAR around early announcements (0.53%) is positive yet insignificant. However, the positive difference in the mean returns of bidders that made early announcements and those that did not is 1.49% and statistically significant. In the third row, we report the bidder combined CAR which is the sum of bidder early announcement CAR (if there is an early announcement) and bidder agreement CAR, and compare to the bidder CAR on the day of agreement announcement for the non-early announced deals. For early announced deals, on average, combined CAR is 1.13%, while non-early announced deals have -0.96% for combined CAR. The difference between the combined announcement returns for early announced deals and others is 2.09% and both economically and statistically significant.

Further, we compare the announcement returns between high attention and low attention bidders of early and non-early announced deals. Bidder firms are considered subject to high investor attention when the daily abnormal trading volume (*AbVOL*) on the announcement day is in the top quartile in the year of the corresponding group (i.e., early announcement day for early announced deals; agreement announcement day for non-early announced deals). Otherwise, bidder firms are considered subject to low investor attention. Panel B of Table 4 reports that the average bidder combined CAR(-1,1) for early announced deals with high

attention is 5.13% and significant at 5%, while combined CARs for low attention

bidders that made the early announcement is 0.2% and not statistically significant.

This implies that abnormal investor attention increases the positive market reaction

to early announcements. When we look at the return difference between these two

groups, the mean difference of 4.92% is positive and significantly different from

zero at 5% level. These results provide further evidence for Hypothesis 2 that early

announcement deals with high attention have higher returns in the short run.

Panel C of Table 4 reports that CARs around agreement announcements for

non-early announced deals for bidders with high and low attention. The average

bidder CAR (-1,1) is -1.67% for deals with high attention, while the average bidder

CAR(-1,1) is -0.72% for deals with low attention. The difference between the

CARs of agreement announcement of high attention and low attention bidders is

 -0.95% indicating that high attention firms earn considerably lower returns

compared to their low attention peers.

Panel D of Table 4 further compares CARs for early announced deals with

high attention and other deals (include early announced deals with low attention and

all non-early announced deals). The bidder CAR(-1,1) for early announcements of

high attention firms is 2.37% and the combined CAR(-1,1) for this subgroup is

5.13%, while for all non-early announced deals and early announced deals that

receive the low attention, CARs are negative (-0.92% in bidder CAR(-1,1) and -

0.91% in combined CAR(-1,1)). Compared to all other deals, early announced deals

with high attention are always associated with higher CARs: the difference of 3.29%

in bidder CAR (-1,1) and the difference of 6.04% in combined CAR (-1,1), which

are both significant at the traditional level.

Overall, this preliminary analysis provides evidence that increased investor attention on early announced deals is associated with higher returns which are also economically meaningful. These results hold for comparisons between the early announced deals and others and within-group analysis of early announced deals that attract high versus low attention. We show short-term value creation in mergers is correlated with the timing of takeover announcements (early announced deals) and the degree of investor attention. This evidence provides supports for both H_{2a} and H_{2b} in the short run that early announced deals with high attention receive higher returns.

*****insert table 4 here*****

To control for the other determinants of merger performance, we estimate model 5. Table 5 presents results for model 5 in which we control for the firm- and deal- characteristics, year, and industry effects. Column 1 reports results for the relation between early announced deals and combined bidder CAR (-1,1) (sum CARs of the early announcement and agreement announcement if there is an early announcement) based on the degree of investor attention. Column 2 reports results for the relation between early announced deals and bidder CAR (-1,1) (the early announcement CARs for early announced deals ; the agreement announcement CARs for non-early announced deals) on the condition of investor attention. Column 1 reports the coefficient of Early is 0.02, statistically significant at 10%. This evidence confirms the finding of Aktas *et al.* (2018) that early announcements are associated with higher returns over a short-term period. Column 1 further shows that early announced deals with high attention, on average, earn 5.7% higher returns than other deals. It is also economically meaningful as in prior univariate analysis. The coefficient on the interaction term($Early \times HighAtt$) is highly significant at 1% level. In column 2, we use the bidder CAR (-1,1) as the outcome variable. We

find that the coefficient of the interaction term is 0.033, significant at the traditional level, indicating early announced deals with high attention continue to earn higher returns in the short run.

*****insert table 5 here*****

4.3 Heckman two-stage model analysis

We use the Heckman two-step procedure to control for the potential endogeneity problem. Specifically, the first-stage decision model determines the choice of issuing early announcements, and the second-stage outcome model corrects for the selection bias by including the inverse Mill's ratio (IMR) calculated from the first-stage probit regression. It is suggestable to include a variable that is in the first-stage model but not in the second-stage model (Li and Prabhala, 2007). Ideally, this variable could directly influence the decision to announce early but not affect the outcome variable. Consistent with the spirit of Golubov *et al.* (2012), we use the past experience of issuing early announcements to satisfy the identification restriction. The variable *PastEarly* equals to one if the bidder firms have any past early announcements prior to the date of early announcements, and zero otherwise.

Table 6 reports the estimation results of CARs in the Heckman model. As expected, the coefficient on *PastEaly* is positive and highly significant at 1% level, suggesting that bidder firms have past experience of early announcements in takeovers are more likely to voluntarily disclose early again. In line with prior literature (Aktas *et al.* 2018), we find a positive relationship between tender offer and bidder firm's decision to announce early. Besides, 22% of the pseudo-R^2 indicates that our first-stage model can explain around 22% of the choice of early announcements.

In the second-stage model, we include the inverse Mills ratio in column 2 and 3 of Table 6. Consistent with prior findings in OLS regressions, the effect of $Early \times HighAtt$ on both combined CAR and bidder CAR is still positive and statistically significant (1% and 5%, respectively). These coefficient estimates are close to the results in Table 5. This evidence continues to suggest that early announced deals with high attention predict higher short-term returns. Put together, our finding is not sensitive to the correction of self-selection bias in the Heckman model.

<center>*****insert table 6 here*****</center>

4.4 PSM analysis

In this section, we intend to address the potential concern raised by Tucker (2010) who argues that the Heckman two-stage model (1979) mainly corrects the selection bias due to unobservable factors. Although our results continue to hold in the Heckman model, the selection bias due to observable factors might bias prior results. We therefore use the propensity-score matching (PSM) analysis to reinforce findings from previous sections. Specifically, we use the logit model to estimate the propensity scores as in column 1 of Table 6. The treatment group is defined as bidder firms with early announcements, while the control group is bidder firms without early announcements. To construct the matching sample, we match each treated firm with the closest propensity score of control firms using a one-to-one nearest neighbor matching method without replacements. This ensures that bidder firms without matching are dropped from the sample. The covariate matrix used for the matching is based on a set of control variables in the model 5:

$Bidder\ Size$, $Bidder\ BTM$, $Bidder\ Runup$, $Bidder\ Sigma$, $Target\ Size$,

$Target\ Leverage$, $Target\ BTM$, $Target\ Runup$, $Target\ Sigma$,

$Stock$, $Diversify$, $HighTech$, $Tender$, and $Relative\ Size$.

     Table 7 shows the PSM analysis. Panel A of Table 7 reports the univariate comparison of key variables between treated and control groups. Clearly, after matching, propensity scores and key covariates are successfully balanced in our tests. All paired differences are insignificant from zero based on the reported P-value, suggesting that observable characteristics of bidder firms are similar between treated and control groups.

     Importantly, Panel B reruns regressions in the Tabel 5 using a matched sample. For brevity, we report the coefficients of $Early,\ Early \times HighAtt,$ $and\ HighAtt$. Consistent with previous findings, early announced deals with high attention are associated with higher CARs (i.e., 8.9% increase in combined CAR and 6.9% increase in bidder CAR), which indicates that abnormal investor attention inflates the short-term market reaction to early announcements. Overall, the robustness of our findings across the Heckman two-stage model (1979) and PSM analysis reduces concerns of the self-selection bias.

<div align="center">*****insert table 7 here*****</div>

4.5 Attention, early announcements, and long-term performance of bidders

    So far, our results show that early announcements increase abnormal attention and excessive attention amplifies the positive relation between early announcements and abnormal returns in the short run. However, this short-term valuation premium is predicted both by the price pressure and price discovery hypothesis therefore we examine longer horizon returns next. If the short-term positive CARs around early announcements are driven by the price pressure hypothesis, it is expected that

positive returns on early announcements with high attention are eventually reversed in the long run due to the bias corrected by the market (**H$_{2a}$**). However, if abnormal attention increases the market efficiency and price discovery, we should observe a positive relationship between early announcements with high attention and long-run abnormal returns (**H$_{2b}$**).

Table 8 reports results for long-term performance of early announced deals. We estimate model 5 and the dependent variable is replaced by the buy-and-hold abnormal returns (BHAR*)* defined in equation 3.

Column 1 of Table 8 reports BHAR over a 6-month window starting from the month after agreement announcement. We find that coefficient of Early is still positive at 0.081 and significant at 5%. However, the estimation of the interaction term ($Early \times HighAtt$) is -0.167 and statistically significant at 1% level, which suggests that early announced deals with high attention, on average, earn lower returns by 0.086% (=0.081%-0.167%) in the long run.

In column 2, it reports BHAR for a period of 12 months. The estimator for Early is 0.157 and significant at 1% level, while the coefficient of $Early \times HighAtt$ is -0.2 and significant at 5% level. Similarly, this evidence indicates that early announced deals with high attention acquire lower returns over a year.

We continue to find similar reversed return patterns in column 3, when we use a longer period of BHAR (18 months). In column 4, the coefficient of the interaction term is still negative but insignificant at the traditional level, when we estimate the BHAR over a two-year period.

Overall, the results of Table 8 show that early announced deals with high attention experience a price reversal in the long run, which provides supports for the

price pressure hypothesis. This evidence also supports the predictions of price pressure hypothesis in prior literature on investor attention that the short-term inflated stock price of attention-grabbing events eventually experience a price reversal due to the investor's behavioral bias-corrected (for example, large spending on advertising in Lou (2014); small acquisitions announced on the day of macroeconomic news in Barbopoulos *et al.* (2020)).

<div align="center">*****insert table 8 here*****</div>

4.6 Attention, early announcements, and deal competition

Prior literature shows that early announced deals induce the deal competition during the transaction period since early announcements are interpreted as a good signal of targets' quality by the market (Aktas *et al.* 2018). However, due to our findings of long-term price reversal on early announced deals with high attention, an interesting question arises about whether or not early announced deals with high attention are more competitive in the market in terms of competitive bids.

To answer this question, we use a probit model to examine the relationship between early announced deals with high attention and the deal competition[4]. We use a dummy variable (*Competing*) that takes the value of one if a competing bid is recorded in the SDC, and zero otherwise. We estimate model 5 using the same controls, fixed effects, and clustering methods with *Competing* dummy as the dependent variable. Table 9 reports probit estimation results. In column 1 of Table 9 we report results without control variables. The coefficient estimate on early announced deals (0.136) is positive and significant at 1%, indicating that early announcements averagely increase a higher likelihood of competing bids by around 14%. This result is consistent with the finding of Aktas *et al.* (2018). However, when

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[4] In untabulated results, we also confirm the results of Table 9 using a logit model.

we consider the level of attention an early announcement attracts, we observe that the coefficient of $Early \times HighAtt$ is negative suggesting early announced deals are related with an average lower probability of competing bids by 11% due to high attention, significant at 5% level. This evidence shows that the positive relationship between early announcement and deal competition decreases for early announcements that attract high attention. Column 2 shows that this finding holds after including a set of firm characteristics, deal characteristics, year and industry fixed effects. Overall, these results provide support for hypothesis $\mathbf{H_{3a}}$ that early announcements with high attention reduce deal competition in the public phase.

*****insert table 9 here*****

5. Robustness tests

In this section, we examine the robustness of the relationship between early announced deals with high attention and returns by considering an alternative definition of high attention, in a subsample of without financial crisis in 2008, and in a subsample of without the financial and utility industry. We rerun regressions using these alternatives and the same specifications as in model 4. Overall, our results are not sensitive to these robustness tests, which implies that the price pressure effect caused by the increased investor attention is strong in early announced deals.

5.1 Alternative definition of high attention

In the previous analysis, we define the $HighAtt$ as the abnormal trading volume is the top quartile in the year. To test whether our results are sensitive to this cutoff, we use an alternative definition of $HighAtt$ that is the abnormal trading volume in the top quintile in the year. Panel A of Tabel 10 reports these results. In column 1 and 2, coefficients of $Early \times HighAtt$ are positive and statistically significant at 1% level, supporting evidence that early announced deals with high

attention are associated with higher short-term returns. As expected, the return reversal effect exists when we examine the bidder wealth effect in the longer horizons. All coefficients of interaction term become negative and are still significant at the traditional level. This alternative measure of high attention requires a higher degree of abnormal investor attention, which seems to yield stronger results. Thus, it shows that increased investor attention has an important role in affecting the market reaction to early announced deals.

5.2 Sample without 2008 financial crisis

As our sample period is from 2005 to 2018, it includes the recent extremely market negative shock: the financial crisis in 2008. To check whether the extreme market uncertainty drives the price reversal of early announced deals with high attention, we drop deals announced in 2008. Panel B reports estimation results. Consistent with findings from the main tables, the positive wealth effects of early announced deals are decreasing with high attention in the long run.

5.3 Sample without financial and utility industry

In the prior main analysis, the sample has no restriction on the bidder firm's industry. Due to highly regulated in the financial and utility industry, one potential concern is that the return patterns around CARs and BHARs are driven by these regulated industries. To check the robustness of prior findings, we exclude firms from the utility (SIC codes 4900-4999) and financial industries (SIC codes 6000-6999).

Panel C of Tabe 10 reports the results of this subsample analysis. Collectively, it shows that the price pressure effect is generally in early announced deals, which is not sensitive to regulated industries.

*****insert table 10 here*****

6. Conclusions

Investor attention is an important factor to affect marker reactions to takeover deals. In this study, we investigate the role of investor attention on early announced deals in both short-term and long-term performance. Using the abnormal trading volume and google search volume index as the proxy of investor attention, we find a positive relationship between the investor attention and early announcements in takeovers. Our results show that investors pay close attention to this type of M&A disclosures. Moreover, our univariate and multivariate results show that early announced deals with high attention realize higher short-term abnormal returns, which are reversed in the long-term. Finally, we further find that the positive relationship between early announced deals and public competitions is decreasing with abnormal attention. Overall, our findings support the role of investor attention in the price pressure hypothesis.

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Appendix 1

Variable	Definition	Source
$AbSVI_{i,t}$	The Google search volume index (SVI) for the bidder firm i stock ticker on day t minus average same-day value of the week for the same firm over the past 10 weeks, scaled by the average. Daily SVI are standardized across months using monthly SVI as follows: SVI= SVI_daily X SVI_monthly /100	Google
$AbVOL_{i,t}$	The dollar trading volume for the bidder firm i on day t minus average same-day dollar trading volume of the week for the same firm over the past 10 weeks, scaled by the average	CRSP
$HighAtt_{i,t}$	The indicator variable which equals to one if the abnormal trading volume on the first announcement day is the top quartile in the year, and zero otherwise	CRSP
$Early_{i,t}$	A dummy variable sets to one if bidder firm i's day t has early announcements, and zero otherwise	EDGAR; SDC
$DealAnn_{i,t}$	A dummy variable sets to one if bidder firm i's day t has agreement announcements, and zero otherwise	SDC
$Raw\ return_{i,t}$	The raw stock return of bidder firm i on the day t	CRSP
$Analyst_{i,t}$	The natural log of 1 plus the number of analysts providing earnings forecast for bidder firm i at the end of last fiscal quarter t	I/B/E/S
$Size_{i,t}$	The natural log of the total assets for firm i at the end of last fiscal quarter t;	CRSP
$Leverage_{i,t}$	The ratio of the book value of debt divided by market value of total assets for firm i at the end of last fiscal quarter t	Compustat
$BTM_{i,t}$	The ratio of the book value of equity to the	Compustat

	market value of equity for firm i at the end of last fiscal quarter t	
$InstOwn_{i,t}$	The ratio of shares holding by institutional investors scaled by total shares outstanding for firm i using the most recent information during quarter t	Thomson Financial 13F
$PastEarly$	The dummy variable equals to one if the bidder firms have any past early announcements prior to the date of early announcements, and zero otherwise	EDGAR; SDC
$Competing$	A dummy variable takes the value of one if a competing bid is recorded in the SDC, and zero otherwise	SDC
$Stock$	A dummy variable sets to 1 if the deal is fully paid in stock, and zero otherwise	SDC
$Diversify$	A dummy variable sets to 1 if the bidder and target are not from the same group of Fama-French 48 industry, and zero otherwise	SDC
$HighTech$	A dummy variable sets to 1 if bidder and target are both from high tech industries defined by Loughran and Ritter (2004), and zero otherwise	SDC
$Tender$	A dummy variable sets to 1 if the deal is the tender offer, and zero otherwise	SDC
$Deal\ size$	The total value of the transaction as reported by SDC	SDC
$Relative\ size$	The deal size reported from SDC divided by the bidder firm's market value of equity 4 weeks prior to the announcement day	SDC ; CRSP
$Run\ up$	Market-adjusted buy-and-hold return of the acquirer/target firm's stock over the period beginning 205 days and ending 6 days prior to the announcement	CRSP
$Sigma$	The standard deviation of the bidder firm's	CRSP

	market-adjusted daily returns from CRSP over the period starting at 205 and ending 6 days prior to the announcement day	
Bidder CAR$[-1,1]$	The three-day cumulative abnormal returns around the announcement date using the market model with the parameters estimated over the period starting 205 days and ending 6 days prior to the event date. The benchmark portfolio is the CRSP value-weighted index return in the model	CRSP
Bidder agreement CAR [-1,1]	The three-day cumulative abnormal returns around definitive agreement date for the subsample of early announced deals	CRSP
Bidder Combined CAR$[-1,1]$	The sum of bidder announcement CARs and agreement CARs for the subsample of early announced deals, and equal to the bidder announcement CARs for the subsample of non-early-announced deals	CRSP
$BHAR_{1,6}$	The bidder firm's buy-and-hold abnormal returns for the period of 6 months following the month of the first announcement	CRSP
$BHAR_{1,12}$	The bidder firm's buy-and-hold abnormal returns for the period of 12 months following the month of the first announcement	CRSP
$BHAR_{1,18}$	The bidder firm's buy-and-hold abnormal returns for the period of 18 months following the month of the first announcement	CRSP
$BHAR_{1,24}$	The bidder firm's buy-and-hold abnormal returns for the period of 24 months following the month of the first announcement	CRSP

Figure 1

Average abnormal trading volume around M&A early announcement day
The figure plots the mean abnormal trading volume (AbVOL) around the day of the
bidder early announcements (day 0) and a randomly selected event date (day 0).
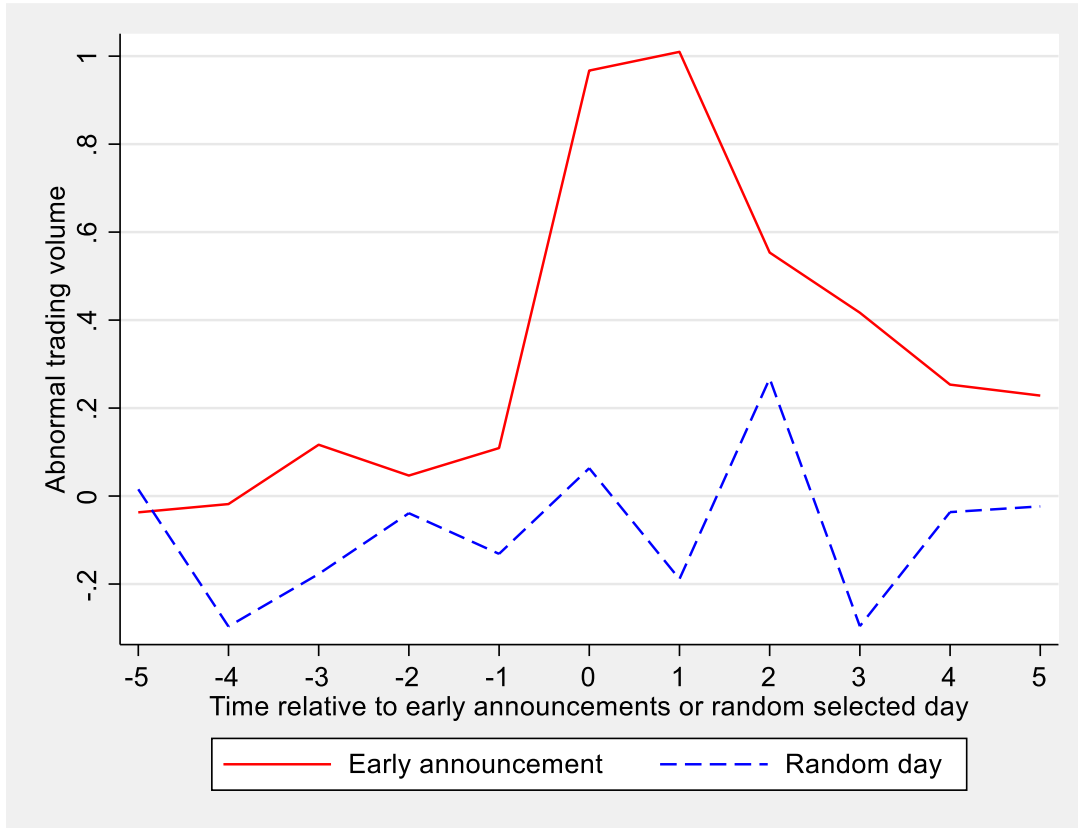
Figure 2

Average AbSVI around M&A early announcement day

The figure plots the mean abnormal search volume (AbSVI) around the day of the bidder early announcements (day 0) and a randomly selected event date (day 0).
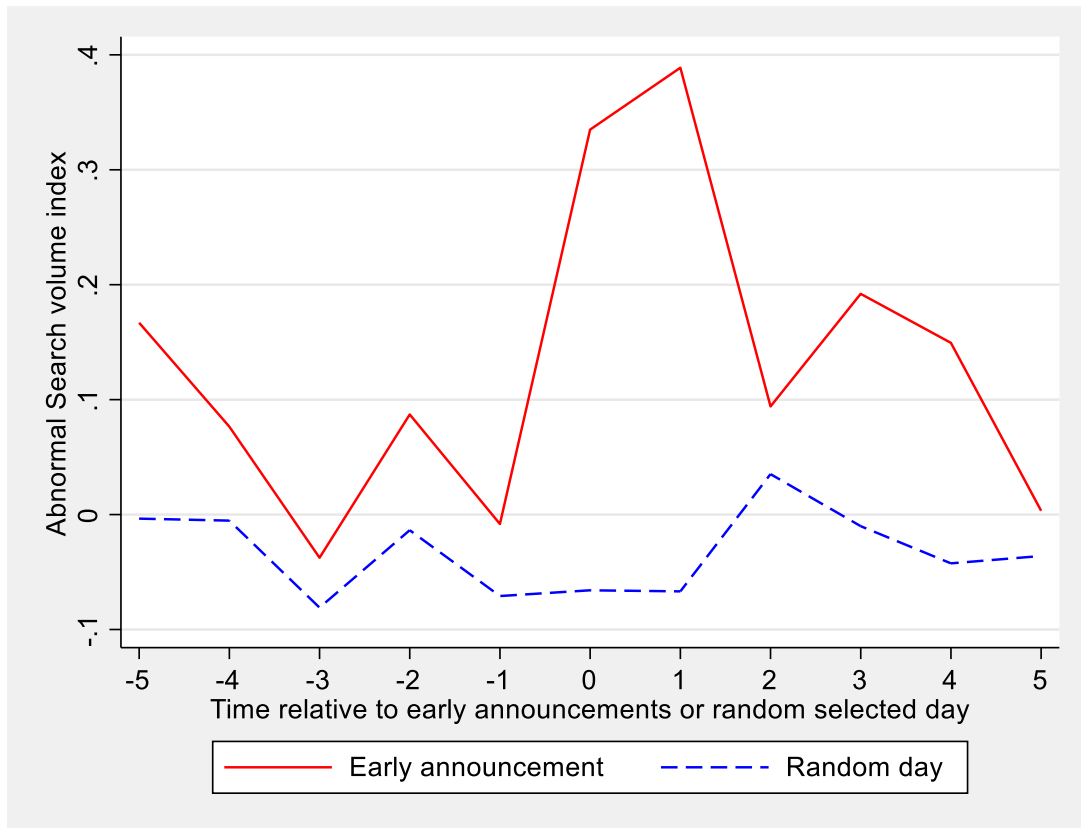
Table 1

The industry and year distribution of total deals and early announced deals

This table reports the distribution of total deals and early announced deals. The sample covers 1302 takeovers from 2005 to 2018 with 64 deals issuing early announcements. Panel A shows the number of total deals, the number of early announced deals and percentage of early announced deals across the Fama-French 12 industries, respectively. Panel B report the year distribution of the number of total deals, the number of early announced deals and percentage of early announced deals, respectively. Panel C reports the days gap between early announcements and definitive announcements.

Panel A: deal across Fama-French 12 industries			
	Total deals	Number of early announcements	Percent of early announcements
Industry:			
Consumer Nondurables	31	6	19.35%
Consumer Durables	11	2	18.18%
Manufacturing	83	3	3.61%
Oil, Gas, and Coal	57	3	5.26%
Chemicals	20	2	10.00%
Business Equipment	302	14	4.64%
Communications	42	6	14.29%
Utilities	43	2	4.65%
Wholesale and Retail	63	3	4.76%
Healthcare	164	10	6.10%
Finance	404	10	2.48%
Other	82	3	3.66%
Total	1,302	64	4.92%

Panel B: deal across years			
Year	Total deal	Number of early announcements	Percent of early announcements
2005	128	8	6.25%
2006	132	4	3.03%
2007	127	4	3.15%
2008	75	5	6.67%
2009	74	9	12.16%
2010	90	3	3.33%
2011	53	4	7.55%
2012	83	2	2.41%
2013	74	4	5.41%
2014	100	6	6.00%
2015	101	6	5.94%
2016	102	4	3.92%
2017	69	2	2.90%
2018	94	3	3.19%
Total	1,302	64	4.92%

Panel C: days between early announcements and definitive announcement	
Mean	75 days
Median	55 days

Table 2
Summary statistics

This table provides summary statistics for main variables. The sample covers 1302 deals from 2005 to 2018 with 64 deals issuing early announcements. We collect deals with at least $10 million deal size value and deals are not recognized as spinoff, repurchase, self-tenders, recapitalizations, going privatizations, liquidations, exchange offers, acquisitions of remaining interest, and partial interest or assets. We require that the bidders control at least 50% of target shares after transaction. Table 2 reports the number of observations, mean, standard deviation, 10th percentile, median, 90th percentile for main variables. All continuous variables are winsorized at 1st and 99th percentiles. The detailed variable definition can be found in Appendix 1.

Variable	N	Mean	St.Dev.	P (10)	Median	P (90)
Early	1,302	0.049	0.216	0.000	0.000	0.000
AbVOL	1,302	2.650	4.331	-0.735	0.842	8.021
AbSVI	1,168	0.937	2.657	-1.000	0.145	2.815
Deal Characteristics						
Stock	1,302	0.228	0.420	0.000	0.000	1.000
Cash	1,302	0.387	0.487	0.000	0.000	1.000
Diversify	1,302	0.293	0.455	0.000	0.000	1.000
HighTech	1,302	0.094	0.292	0.000	0.000	0.000
Tender	1,302	0.149	0.356	0.000	0.000	1.000
Deal size (Billion)	1,302	2.962	6.895	0.150	0.633	7.230
Relative size	1,302	0.398	0.525	0.014	0.203	1.032
Bidder Characteristics						
Size (Billion)	1,299	26.791	65.010	0.573	5.873	70.829
Leverage	1,297	0.148	0.128	0.010	0.115	0.326
BTM	1,297	0.502	0.319	0.168	0.457	0.881
Run up	1,302	0.053	0.265	-0.229	0.022	0.359
Sigma	1,302	0.016	0.009	0.009	0.014	0.027
Target Characteristics						
Size (Billion)	1,197	3.280	7.816	0.078	0.820	7.780
Leverage	1,195	0.144	0.155	0.000	0.103	0.364
BTM	1,195	0.591	0.547	0.150	0.490	1.104
Run up	1,248	0.036	0.425	-0.392	-0.020	0.461
Sigma	1,227	0.025	0.016	0.011	0.021	0.043

Table 3
Investor attention around early announcements in takeovers

The table covers 1302 deals from 2005 to 2018 with 64 deals issuing early announcements. An early announcement day is defined as the day of early announcements. A quiet day is defined as days without early announcements. AbVOL is defined as the dollar trading volume for the bidder firm i on day t minus average same-day dollar trading volume of the week for the same firm over the past 10 weeks, scaled by the average. AbSVI is defined as the Google search volume index (SVI) for the firm i stock ticker on day t minus average same-day value of the week for the same firm over the past 10 weeks, scaled by the average. Daily SVI is standardized across months using monthly SVI as follows: $SVI = SVI_{daily} \times SVI_{monthly} / 100$. In Panel A, we calculate the average abnormal trading volume (AbVOL) and abnormal SVI (AbSVI) for bidder firms on early announcement days, quiet days, and their difference for each firm. The difference tests are based on t-tests for the mean. In Pane B, we run daily panel regressions of AbVOL and AbSVI from bidder firms on the early announcement dummy variable, controlling for a set of firm characteristics, firm, year, month, and week fixed effects. Robust standard errors are two-way clustered at the firm and industry level. The t statistics are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Panel A: early announcement day and quiet day

	AbVOL			AbSVI		
	Early announcement day	Quiet day	Difference (P-value)	Early announcement day	Quiet day	Difference (P-value)
Mean	0.999	0.048	0.952*** (0.00)	0.340	0.042	0.297** (0.038)
Number of days	64	2,513,415		56	2,355,865	

Panel B: regression analysis

	AbVOL		AbSVI	
	(1)	(2)	(3)	(4)
Early	0.920***	0.919***	0.225***	0.263***
	(5.328)	(5.313)	(3.494)	(3.649)
DealAnn	1.363***	1.362***	0.315***	0.253***
	(24.416)	(24.461)	(12.895)	(11.685)
Bidder Size (Log)	-0.004***	-0.024***	-0.039***	-0.061***
	(-7.563)	(-9.150)	(-8.430)	(-4.783)
Bidder Leverage	-0.002	-0.013	-0.101**	0.073
	(-0.337)	(-0.911)	(-2.063)	(1.332)
Bidder BTM	-0.007***	-0.004	0.077***	-0.012
	(-2.826)	(-0.872)	(4.790)	(-0.953)
Analyst (Log)	-0.008***	-0.021***	-0.010	0.010
	(-7.128)	(-6.966)	(-0.909)	(0.978)
InstOwn	-0.020***	-0.032***	-0.031	-0.002
	(-6.176)	(-4.351)	(-1.102)	(-0.066)
Raw return	2.015***	2.003***	0.176***	0.144***
	(38.144)	(38.029)	(7.552)	(7.046)
Year FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Day of week FE	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes
Adjusted-R^2	0.025	0.025	0.031	0.034
N	2,159,937	2,159,937	1,567,655	1,567,655

Table 4
Univariate analysis of early announcement CARs

The table reports the univariate analysis of the bidder's three-day cumulative abnormal returns (CARs) across various groups of deals based on the timing of announcements and the degree of investor attention on the first announcement day. In each subsample of group deals, bidder firms are considered subject to high (low) investor attention when the daily abnormal trading volume (AbVol) on the first announcement day is the top (bottom three) quartile in the year. CARs are defined as the market model with the parameters estimated over the period starting 205 days and ending 6 days prior to the event date. The benchmark portfolio is the CRSP value-weighted index return in the model. Bidder CAR is the announcement return around the first deal announcement date. Bidder agreement CAR is the announcement return around definitive agreement date for the subsample of early announced deals. Bidder combined CAR is the sum of announcement CARs and agreement CARs for the subsample of early announced deals, and equal to the announcement CARs for the subsample of non-early announced deals. Panel A reports analysis for the whole sample and subsample of early announced deals and non-early announced deals, respectively. Panel B reports analysis of a subsample of early announced deals across the degree of investor attention, while Panel C reports the subsample of non-early announced deals across the degree of investor attention. Panel D reports an analysis of the overall sample across the deal type and the degree of investor attention. The difference tests are based on t-tests for the mean
*, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Panel A: comparison between early and non-early announced deals (%)				
	ALL	Early announcement deal	Non-early announcement deal	Difference
	(1)	(2)	(3)	(2)-(3)
Bidder CAR [-1,1]	-0.88***	0.53	-0.96***	1.49*
Bidder agreement CAR [-1,1]		0.59		
Bidder combined CAR [-1,1]	-0.85***	1.13	-0.96***	2.09**
N	1,302	64	1,238	

Panel B: comparison between early announced deals with high attention and low attention (%)			
	High attention (Top quartile)	Low attention (Bottom three quartiles)	Difference (High-Low)
Bidder CAR [-1,1]	2.37	0.11	2.26
Bidder combined CAR [-1,1]	5.13**	0.20	4.92**
N	12	52	

Panel C: comparison between non-early announced deals with high attention and low attention (%)			
	High attention (Top quartile)	Low attention (Bottom three quartiles)	Difference (High-Low)
Bidder CAR [-1,1]	-1.67 ***	-0.72***	-0.95**
Bidder combined CAR [-1,1]			
N	303	935	

Panel D: comparison across deal groups (%)			
	Early announced deals (High attention)	All other deals	Difference (High-All)
Bidder CAR [-1,1]	2.37	-0.92***	3.29*
Bidder combined CAR [-1,1]	5.13**	-0.91***	6.04**
N	12	1,290	

Table 5
Market reaction to early announcements and investor attention
The table reports results of the cross-sectional OLS regression analysis of cumulative abnormal returns on early announced deals with high attention and a set of control variables for a sample of U.S. deals during the 2005-2018 period. The dependent variable is the three-day bidder's CARs. The bidder CAR is defined as the three-day cumulative abnormal returns around the announcement date. The combined CAR is defined as the sum of bidder announcement CARs and agreement CARs for the subsample of early announced deals, and equal to the bidder announcement CARs for the subsample of non-early-announced deals. All variable definitions can be found in Appendix 1. All regressions control for year fixed effects and industry fixed effects. Robust standard errors are two-way clustered at the firm and industry level. The t statistics are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Variables	Combined CAR [-1,1]	Bidder CAR[-1,1]
	(1)	(2)
Early	0.020*	0.016*
	(1.865)	(1.808)
Early X HighAtt	0.057***	0.033*
	(2.807)	(1.894)
HighAtt	0.001	-0.001
	(0.090)	(-0.084)
Bidder Size (Log)	-0.000	0.000
	(-0.171)	(0.044)
Bidder Leverage	0.056**	0.051**
	(2.230)	(2.046)
Bidder BTM	-0.007	-0.009
	(-0.565)	(-0.745)
Bidder Run up	-0.006	-0.007
	(-0.538)	(-0.654)
Bidder Sigma	-0.691	-0.627
	(-1.295)	(-1.207)
Target Size(Log)	-0.002	-0.002
	(-0.797)	(-0.811)
Target Leverage	0.007	0.006
	(0.355)	(0.310)
Target BTM	0.012**	0.012**
	(2.163)	(2.177)
Target Run up	0.007	0.007
	(1.358)	(1.451)
Target Sigma	-0.079	-0.039
	(-0.342)	(-0.171)
Stock	0.005	0.005
	(0.836)	(0.805)
Diversify	-0.007	-0.008
	(-1.168)	(-1.324)
HighTech	0.000	-0.001

	(0.019)	(-0.101)
Tender	-0.000	0.000
	(-0.068)	(0.023)
Relative Size	-0.013	-0.010
	(-1.638)	(-1.280)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Adjusted-R^2	0.089	0.083
N	1,164	1,164

Table 6
Heckman two-stage procedure-Bidder CARs

The table presents results of Heckman two-stage procedure for Bidder CARs to allow for the possibility of the early announcements being endogenous determined. The first-stage selection equation (Column 1) is estimated by the probit regression, where the dependent variable is the Early dummy variable which sets to one if the bidder firm i's day t has the early announcements, and zero otherwise. Column 2 and 3 are the second-stage equation, where the dependent variable is the Bidder CAR and Combined CAR, respectively. The inverse Mills ratio is included in the outcome regressions. The PastEarly variable equals to one if the bidder firms have any past early announcements prior to the date of early announcements, and zero otherwise. Other variable definitions can be found in Appendix 1. All regressions control for year fixed effects and industry fixed effects. Robust standard errors are two-way clustered at the firm and industry level. The t statistics are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

	Selection (Early=1)	Combined CAR [-1,1]	Bidder CAR [-1,1]
	(1)	(2)	(3)
PastEarly	1.585***		
	(3.520)		
Early		0.021*	0.017*
		(1.867)	(1.797)
Early X HighAtt		0.059***	0.035**
		(2.927)	(2.018)
HighAtt		-0.000	-0.002
		(-0.067)	(-0.244)
Bidder Size (Log)	-0.134**	0.002	0.002
	(-1.989)	(0.538)	(0.740)
Bidder Leverage	1.030	0.043	0.037
	(1.422)	(1.442)	(1.266)
Bidder BTM	0.197	-0.014	-0.016
	(0.766)	(-0.934)	(-1.131)
Bidder Run up	-0.022	-0.003	0.011*
	(-0.079)	(-0.235)	(1.746)
Bidder Sigma	11.104	-0.539	-0.224
	(1.019)	(-0.920)	(-0.724)
Target Size (Log)	0.246***	-0.004	-0.004
	(3.263)	(-1.001)	(-1.049)
Target Leverage	-1.105*	0.025	0.024
	(-1.896)	(1.046)	(1.031)
Target BTM	-0.304	0.016**	0.015**
	(-1.594)	(2.242)	(2.290)
Target Run up	-0.282*	0.010	0.011*
	(-1.678)	(1.630)	(1.746)
Target Sigma	16.316***	-0.265	-0.224
	(2.848)	(-0.835)	(-0.724)
Stock	0.030	0.005	0.004
	(0.151)	(0.761)	(0.736)
Diversify	0.191	-0.009	-0.010
	(0.953)	(-1.152)	(-1.312)
HighTech	0.295	-0.002	-0.003

	(1.082)	(-0.157)	(-0.276)
Tender	0.946***	-0.014	-0.013
	(4.551)	(-0.993)	(-1.013)
Relative Size	-0.086	-0.015*	-0.012
	(-0.498)	(-1.784)	(-1.400)
Inverse Mills Ratio		-0.012	-0.012
		(-0.914)	(-0.984)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Adjusted-R^2/ Pseudo- R^2	0.220	0.077	0.069
N	980	980	980

Table 7

PSM analysis

The table presents results from a propensity score matching analysis. The treatment group is defined as the bidder firms with early announcements, while the control group is defined as the bidder firms without early announcements. We match firms using one-to-one nearest neighbour propensity score matching, without replacement. Panel A reports the univariate comparison between the treatment and control firms' characteristics and corresponding P-values. Panel B reports coefficients of Early, Early X HighAtt, and HighAtt from the regression with the same specification as in Table 5 on the matched sample. Other variable definitions can be found in the Appendix. All regressions control for year fixed effects and industry fixed effects. Robust standard errors are two-way clustered at the firm and industry level. The t statistics are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Panel A: covariates balancing								
Variable	Before Matching				After matching			
	Treatment	Control	Difference	P-value	Treatment	Control	Difference	P-value
Propensity score	0.210	0.051	0.160	0.000	0.145	0.147	-0.002	0.948
Bidder Size (Log)	8.537	8.741	-0.204	0.384	8.647	8.655	-0.008	0.983
Bidder Leverage	0.181	0.147	0.033	0.044	0.191	0.213	-0.021	0.500
Bidder BTM	0.475	0.501	-0.026	0.535	0.433	0.526	-0.093	0.149
Bidder Run up	0.054	0.056	-0.002	0.960	0.063	0.023	0.040	0.498
Bidder Sigma	0.020	0.016	0.004	0.001	0.018	0.020	-0.002	0.442
Target Size (Log)	6.745	6.658	0.087	0.703	6.739	7.006	-0.267	0.461
Target Leverage	0.173	0.143	0.030	0.145	0.172	0.179	-0.007	0.854

Target BTM	0.475	0.600	-0.125	0.082	0.479	0.641	-0.162	0.200
Target Run up	0.026	0.040	-0.014	0.797	0.055	-0.076	0.131	0.131
Target Sigma	0.031	0.025	0.006	0.004	0.029	0.027	0.002	0.651
Stock	0.177	0.227	-0.049	0.364	0.216	0.235	-0.020	0.815
Diversify	0.306	0.226	0.080	0.143	0.275	0.176	0.098	0.240
HighTech	0.161	0.100	0.061	0.122	0.176	0.275	-0.098	0.240
Tender	0.387	0.131	0.256	0.000	0.333	0.333	0.000	1.000
Relative Size	0.542	0.400	0.142	0.039	0.506	0.653	-0.147	0.309

Panel B: regression diagnostics

Dependent variable	Combined CAR [-1,1]	Bidder CAR [-1,1]
Early	0.018	0.009
	(0.990)	(0.571)
Early X HighAtt	0.089**	0.069*
	(2.072)	(1.738)
HighAtt	-0.013	-0.019
	(-0.396)	(-0.623)
Control Factors	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Adjusted-R^2	0.207	0.194
N	102	102

Table 8
Market reaction to early announcements and investor attention in the long-term

The table reports results of early announced deals with high attention in long-term performance. Column 1, 2, 3, and 4 report bidder firm's buy-and-hold abnormal returns (BHAR) for a period of 6 months, 12 months, 18 months, and 24 months, starting from the month after the first announcement, respectively. All variable definitions can be found in Appendix 1. All regressions control for year fixed effects and industry fixed effects. Robust standard errors are two-way clustered at the firm and industry level. The t statistics are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

	$BHAR_{1,6}$	$BHAR_{1,12}$	$BHAR_{1,18}$	$BHAR_{1,24}$
	(1)	(2)	(3)	(4)
Early	0.081**	0.157***	0.219**	0.156*
	(2.405)	(2.684)	(2.414)	(1.737)
Early X HighAtt	-0.167***	-0.200**	-0.256**	-0.278
	(-2.998)	(-1.993)	(-1.977)	(-1.565)
HighAtt	0.007	-0.028	-0.022	-0.050
	(0.432)	(-1.156)	(-0.725)	(-1.407)
Bidder Size (Log)	-0.006	-0.011	-0.021*	-0.028*
	(-0.974)	(-1.155)	(-1.900)	(-1.902)
Bidder Leverage	-0.012	-0.165	-0.169	-0.257*
	(-0.164)	(-1.534)	(-1.264)	(-1.658)
Bidder BTM	0.031	0.015	0.080	0.084
	(1.049)	(0.332)	(1.222)	(1.115)
Bidder Run up	0.044	0.021	0.044	-0.004
	(1.388)	(0.450)	(0.734)	(-0.060)
Bidder Sigma	-2.524*	-4.305**	-6.461**	-7.070**
	(-1.795)	(-2.201)	(-2.473)	(-2.209)
Target Size (Log)	-0.001	0.012	0.014	0.021
	(-0.218)	(1.229)	(1.223)	(1.258)
Target Leverage	-0.027	-0.118	-0.241**	-0.247**
	(-0.497)	(-1.485)	(-2.452)	(-2.145)

Target BTM	0.004	-0.003	0.027	-0.001
	(0.300)	(-0.113)	(1.019)	(-0.017)
Target Run up	0.019	-0.016	-0.008	-0.037
	(1.208)	(-0.689)	(-0.219)	(-0.964)
Target Sigma	-1.077*	0.561	0.195	0.859
	(-1.793)	(0.552)	(0.150)	(0.489)
Stock	-0.038**	-0.039	-0.027	-0.020
	(-2.439)	(-1.581)	(-0.923)	(-0.580)
Diversify	-0.002	0.001	0.014	0.015
	(-0.098)	(0.052)	(0.427)	(0.421)
HighTech	0.008	0.032	0.072	0.127**
	(0.316)	(0.823)	(1.600)	(2.122)
Tender	0.002	0.001	0.026	0.012
	(0.111)	(0.039)	(0.744)	(0.282)
Relative Size	0.017	0.026	0.005	0.020
	(0.741)	(0.840)	(0.145)	(0.469)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Adjusted-R^2	0.032	0.034	0.065	0.062
N	1,164	1,164	1,164	1,164

Table 9
Deal competition: investor attention and early announcements

The table reports results in a probit model to examine the role of abnormal attention on the relationship between early announced deals and public competitions. The dependent variable in all columns is Competing, which is a dummy variable takes the value of one if a competing bid is recorded in the SDC, and zero otherwise. Other variable definitions can be found in Appendix 1. Coeffients of marginal effects are reported. All regressions control for year fixed effects and industry fixed effects. Robust standard errors are two-way clustered at the firm and industry level. The t statistics are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

	Competing deal=1 Otherwise=0	Competing deal=1 Otherwise=0
	(1)	(2)
Early	0.136***	0.133***
	(7.343)	(7.312)
Early X HighAtt	-0.099**	-0.113***
	(-2.142)	(-2.619)
HighAtt	0.000	-0.002
	(0.032)	(-0.141)
Bidder Size (Log)		-0.008
		(-1.265)
Bidder Leverage		0.030
		(0.473)
Bidder BTM		-0.042
		(-1.479)
Bidder Run up		0.015
		(0.710)
Bidder Sigma		0.097
		(0.103)
Target Size (Log)		0.020***
		(3.537)
Target Leverage		-0.100
		(-1.449)
Target BTM		0.030**
		(2.246)
Target Run up		0.043***
		(3.613)
Target Sigma		0.104
		(0.263)
Stock		-0.069***
		(-2.770)
Diversify		-0.035**
		(-2.203)
HighTech		0.000
		(0.019)
Tender		0.031*
		(1.915)
Relative Size		-0.002
		(-0.130)

Year FE	Yes	Yes
Industry FE	Yes	Yes
Pseudo-R^2	0.248	0.375
N	1,064	943

Table 10

Additional robustness checks

The table reports robustness tests for Table 6 and Table 8 by using an alternative definition of high attention in Panel A, a subsample of time periods in Panel B, and a subsample without financial and utility industries in Panel C. Regression specifications are all same as in main tables. Variable definitions can be found in Appendix 1. All regressions control for year fixed effects and industry fixed effects. Robust standard errors are two-way clustered at the firm and industry level. The t statistics are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Panel A: alternative definition of high attention (top quintile)						
	Combined CAR [-1,1]	Bidder CAR [-1,1]	$BHAR_{1,6}$	$BHAR_{1,12}$	$BHAR_{1,18}$	$BHAR_{1,24}$
	(1)	(2)	(3)	(4)	(5)	(6)
Early	0.026**	0.020**	0.068**	0.152***	0.211**	0.141*
	(2.544)	(2.312)	(2.214)	(2.879)	(2.580)	(1.677)
Early X HighAtt	0.080***	0.049***	-0.224**	-0.398***	-0.495***	-0.481***
	(2.953)	(2.615)	(-2.430)	(-2.732)	(-3.535)	(-3.247)
HighAtt	0.006	0.005	0.009	-0.005	-0.004	-0.039
	(0.755)	(0.606)	(0.535)	(-0.174)	(-0.129)	(-1.020)
Control Factors	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.090	0.083	0.031	0.034	0.066	0.061
N	1164	1164	1164	1164	1164	1164
Panel B: sample without the 2008 financial crisis						
	Combined CAR [-1,1]	Bidder CAR [-1,1]	$BHAR_{1,6}$	$BHAR_{1,12}$	$BHAR_{1,18}$	$BHAR_{1,24}$
	(1)	(2)	(3)	(4)	(5)	(6)
Early	0.022*	0.017*	0.094***	0.156**	0.231**	0.173*

	(1.882)	(1.755)	(2.733)	(2.578)	(2.404)	(1.822)
Early X HighAtt	0.048**	0.028	-0.207***	-0.212*	-0.256*	-0.281
	(2.274)	(1.496)	(-3.780)	(-1.944)	(-1.841)	(-1.469)
HighAtt	0.001	-0.000	0.008	-0.027	-0.029	-0.065*
	(0.141)	(-0.059)	(0.481)	(-1.062)	(-0.903)	(-1.796)
Control Factors	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.095	0.090	0.038	0.027	0.067	0.062
N	1,095	1,095	1,095	1,095	1,095	1,095

Panel C: regression after excluding financial utility industry

	Combined CAR [-1,1]	Bidder CAR [-1,1]	$BHAR_{1,6}$	$BHAR_{1,12}$	$BHAR_{1,18}$	$BHAR_{1,24}$
	(1)	(2)	(3)	(4)	(5)	(6)
Early	0.026**	0.020*	0.100***	0.212***	0.282***	0.209**
	(2.054)	(1.821)	(2.737)	(3.285)	(2.632)	(1.978)
Early X HighAtt	0.051**	0.031	-0.201***	-0.264**	-0.369**	-0.369
	(2.229)	(1.625)	(-3.053)	(-2.134)	(-2.497)	(-1.631)
HighAtt	0.014	0.012	-0.002	-0.027	-0.015	-0.035
	(1.395)	(1.263)	(-0.091)	(-0.789)	(-0.335)	(-0.673)
Control Factors	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.091	0.084	0.037	0.048	0.073	0.056
N	758	758	758	758	758	758