

Can Financial Media Sentiment Predict Merger and Acquisition Performance?

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Abstract

This paper explores whether and how media serves as an information intermediary in the capital market and predicts value creation from mergers and acquisitions (M&As). Using a sample of 288 M&A deals in the U.S. market from 2000 to 2015, this paper examines whether pre-merger news about acquirers correlates to M&A performance. The empirical evidence shows that a positive media attitude before merger announcements has predictive power for stock returns in both the short and long run. Moreover, media pessimism is associated with higher bid premiums, meaning that acquirers must raise the bid price to offset the negative effects produced by the media. These findings suggest that media news contains information relevant to M&A performance and thus has implications for shareholder wealth.

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1. Introduction

It is generally believed that media plays an important role in disseminating information to financial market participants, and that news content affects future stock performance through its effect on investors' perception of investment risk (e.g., Bhattacharya et al., 2009; Tetlock et al., 2008). However, it is unclear whether media can help investors improve their assessment of firms' investment decisions and thus their intrinsic value. On the one hand, media news disseminates undisclosed, fundamental information about firms and predicts their long-term performance (Tetlock et al., 2008; Tetlock, 2010). On the other hand, media sentiment causes investor biases, which may lead to short-term momentum but also long-term reversals in stock returns (Gurun and Butler, 2012). These two perspectives suggest varying implications for how media relates to firms' long-term performance and capital market efficiency. To distinguish between these two views, this paper examines whether financial media predicts value creation through mergers and acquisitions (M&As hereafter).

M&As are recognised as an important way to grow business and have been shown to strongly influence shareholder wealth through changes in stock market prices. However, whether M&As create value for shareholders and support economic growth is inconclusive. Hsueh et al. (2014), for example, show that stock prices lead M&A activities, but there is almost no correlation between M&A activities and economic growth when using stock prices as the control variable. To understand M&As' implications for economic growth and shareholder wealth, it is vital to look more closely at the micro-level value creation of M&As—i.e., whether or not firms' M&A decisions create value and improve acquirers' performance. The most important way that M&As benefit acquirers' performance is through synergies, i.e., the realisation of economies of scale and scope. However, when such operating synergies are outweighed by negative effects, M&As can actually cause deterioration in firm performance. Rezitis (2008) shows that, in the banking industry, technical inefficiencies following mergers

lead to decreases in total factor productivity. It is also worth remembering that M&A decisions are not always motivated by the pursuit of profit. Jovanovic and Rousseau (1992) find that while some merger waves are responses to profit reallocation opportunities, others are not; some are possibly spurred by managerial hubris. This paper investigates whether media has any predictive power for value creation from M&As, and thus help distinguishing M&As that improve firm performance from those do not.

Stock returns—i.e., stock price movements—represent the value created on behalf of shareholders. Under the efficient market hypothesis, the market's assessment of value creation from M&As is fully included in stock returns during the announcement period. Therefore, stock returns around M&A announcement periods are commonly used to measure the net value created by M&As.

A large body of literature documents the effects of media news on asset pricing under various scenarios, such as IPOs (Cook et al., 2006), seasoned equity offerings (Sun et al., 2018), bubbles (Bhattacharya et al., 2009), recessions (Garcia, 2013) and earnings announcements (Peress, 2016). In the setting of M&A activities, we expect financial media to relate to M&A performance through two channels. First, widespread media attention leads to a higher degree of investor recognition of the acquirer and the M&A deal. Green and Jame (2013) document that better investor recognition and more positive sentiment improve firm value. Gurun and Butler (2012) show that news content influences investors' sentiment and valuation of a stock. Second, news content provides investors with undisclosed, fundamental information about acquirers as well as information on M&A efficiency. Tetlock et al. (2008) prove that financial news transmits new, fundamental information to investors. As positive news content indicates better acquirer fundamentals and M&A efficiency, it is expected to lead to higher returns around the merger announcement period.

Nevertheless, the occurrence of positive returns during the announcement period does not necessarily indicate higher value created by M&A activities or better post-merging performance. Autore and Kovacs (2014) find that the higher value brought by better investor recognition in seasoned equity offers is reversed in the three years following the issue. Ahern and Sosyura (2014) suggest that media coverage might even be manipulated by managers during the M&A negotiation period, resulting in news stories that are irrelevant to acquirers' fundamentals and are only able to generate a short-lived run-up in bidders' stock prices. Tetlock (2007) shows that news content is predictive of future stock price movements but that they are later reversed. Therefore, a higher valuation during an M&A announcement could merely be a temporary bias that cannot be sustained in the long run. To distinguish whether news media effects on valuation represent long-run M&A value creation or just a temporary price run-up, we also examine long-term returns during the post-merger period.

Using a sample of U.S. M&A deals between 2000 and 2015, this paper examines how media attitude correlates to both short-term returns around M&A announcements and long-term performance after M&As. We collect a comprehensive dataset that contains 478,830 financial news articles matched to 288 M&A deals in the U.S. market during the period from 2000 to 2015. The M&A deals are divided into subsamples according to a measure of media attitude toward acquirers before deal announcements. By comparing returns around M&A announcements between the subsample with a positive media attitude and the subsample with a negative media attitude, we show that the market responds more favourably to takeover deal announcements when the media attitude is positive. After controlling for various determinants of M&A bidders' stock returns, the empirical results of multivariate regression show a significantly negative relation between media pessimism and announcement returns. We also find evidence that media attitude has predictive power for acquirers' post-merger long-term performance in both univariate and multivariate analyses. These results suggest that media attitude is significantly correlated with both the short-term and long-term performance of acquirers in M&As. Meanwhile, we fail to find any evidence that media

coverage influences acquirers' M&A performance. In addition, we document that acquirers receiving negative news stories tend to pay a higher premium for M&A deals. Our research makes several contributions to the literature. First, while previous works relate media to other corporate events (e.g., Bhattacharya et al., 2009; Cook et al., 2006), we focus on M&As, which are big investment decisions that strongly influence firms' future performance and are vital to economic growth. Second, we examine short-term market reactions to event announcements, as others have done, but we also investigate the relation between media and acquirers' long-term performance, which better reflects value creation from M&As. Our evidence on acquirers' long-term returns is consistent with the notion that the news media provides new information relevant to firm value. Third, unlike works focusing on media coverage, i.e., news quantity (e.g., Cook et al., 2006; Da et al., 2011), we simultaneously consider media coverage and media attitude, i.e., news content. Ferguson et al. (2015) show that media coverage has more predictive power for future returns than media tone. However, our study shows that in the M&A context, media content displays a stronger relation with future returns than media coverage. Finally, our findings are meaningful for both policymakers and stock investors. Policymakers can learn from the financial media how to better distinguish M&As that are beneficial to economic growth from those that are not. For capital market investors, incorporating information contained in the financial media when valuing M&As can result in better investment decisions.

The remainder of this paper is organised as follows. Section 2 develops the main hypotheses. Section 3 introduces the sample selection, variable constructions and descriptive statistics. Section 4 presents the empirical results. Section 5 concludes the paper.

2. Hypothesis development

Acquirer performance in M&As is a major topic in M&A research, as it directly relates to firm value. The literature has identified both deal characteristics, such as payment

methods (Moeller et al., 2007), and acquirer characteristics, such as experience (Luo, 2005) and size (Moeller et al., 2007), that affect acquirers' stock performance in M&A deals.

This paper examines whether the financial media, an outsider in the deal, influences takeover performance. Media affects investors through both media coverage and news content. This study focuses on media attitude, i.e., media content. Johnson et al. (2005) document that favourable news published by the business press results in significant positive returns. Likewise, both Tetlock (2007, 2010) and Fang and Peress (2016) show that media attitudes have significant effects on the stock market. Media attitudes change investor behaviour through influencing their sentiment and valuation of stocks (Gurun and Butler, 2012). Garcia (2013) shows that "media pessimism" has predictive power for daily stock returns, particularly in times of recession. Solomon (2012) finds that firms generate more positive news on purpose to raise investor expectations and improve announcement returns.

In the setting of M&As, we propose two potential mechanisms through which media attitudes influence investors' reactions to takeover announcements. First, media reports provide new information about acquirers' fundamentals and thus influence investors' expectations regarding the efficiency of M&A decisions. Examining the role of media during financial bubbles, Campbell et al. (2012) conclude that the main contribution of media is to provide factual information that investors can use to inform their decisions. Illustrating the sophisticated information mining ability of the media, Miller (2006) shows that almost one third of fraud cases are identified in the media before being announced by the firm in question. Second, aside from whether any new information is provided, positive news induces optimistic investor sentiment, which leads to higher short-term abnormal returns around M&A announcements. These intuitions are formalised in the following hypothesis.

H1: Bidders that attract a more optimistic (pessimistic) media attitude achieve higher (lower) abnormal returns around takeover announcements.

Of course, abnormal announcement returns represent only the short-term reaction to M&A deals in the financial market; the efficiency of M&A decisions is more properly measured by incorporating firms' long-term post-merger stock returns. As previously discussed, we expect that media dissemination of new information about acquirers' fundamentals is one mechanism by which media influences market prices. In this case, media attitudes could have the potential to predict acquirers' future long-run stock performance. However, Tetlock (2007) documents that after media pessimism pressures market prices, the price movement eventually reverses, which suggests that the influence of media content on stock prices results from noise and liquidity traders rather than new information about fundamental asset value. In this case, the high market reaction to takeover announcements is due to temporary investor sentiment, which cannot last long. Ferguson et al. (2015) show that price pressure induced by the tone of news stories is only partially corrected by subsequent reversals, which suggests that news content does incorporate information predictive of asset returns. Thus, whether media attitudes are related to acquirers' long-term performance in M&A settings becomes an empirical question. We state our hypothesis in a directional form.

H2: More optimistic (pessimistic) media attitudes predict higher (lower) long-term abnormal returns of acquiring firms after M&As.

In conclusion, we expect that media attitudes influence market reactions to M&A events through two mechanisms. First, news influences investor sentiment, which is quickly reflected in investors' reactions to takeover announcements. Sentiment is generally a short-term rather than a long-term factor. Second, given that news reports contain undisclosed information about acquirers' fundamentals and resolve the information asymmetry that exists between acquirers and investors, they should be able to predict acquirers' long-term performance. H1 examines whether media attitudes influence

market reactions to M&A announcements, which is a joint consequence of both mechanisms. In H2, we expect media attitudes to have predictive power for acquirers' future stock performance, consistent with our argument that news incorporates undisclosed information relevant to firm value.

As noted earlier, media coverage also influences investors, but in a different way than media attitude does. Previous research (e.g., Cook et al., 2006; Da et al., 2011) point out that media coverage attracts attention from more investors and alleviates information friction among investors, thus generating higher demand for new shares even without necessarily revealing any value-relevant information. These effects may also influence acquirers' short-term and long-term stock performance. Therefore, we also analyse the effects of media coverage on markets' reaction to takeover announcements and acquirers' long-term returns. However, as media coverage is not the focus of this study, we do not propose formal hypotheses about its effects.

3. Data and methodology

3.1. Sample selection criteria

Our M&A data are collected from the SDC Mergers & Acquisitions database, which includes all successful deals during the period January 2000 to December 2015. Collecting data on all deals in which both the acquiring and target firms are U.S.-listed companies, we obtain an initial sample of 133,067 deals. We exclude deals involving firms in the financial and utility industries, as they are under special regulation; this reduces the sample to 88,492 deals. Next, we only keep deals that were successfully completed, which further reduces our sample to 20,177 deals. Then we exclude deals identified by the SDC as forms of privatisation, acquisitions of remaining interest, spinoffs, recapitalisations, repurchases and self-tenders, leaving a sample of 19,566 deals. Furthermore, takeover deals of less than US\$100 million are deleted, as small deals usually fail to attract media coverage before the merger announcements; this leaves a sample of 2,793 deals.

The primary source of media data is the Dow Jones' Factiva database. The financial news articles come from two major U.S. financial media players, the Dow Jones News Service and *The Wall Street Journal (WSJ)*. For each acquirer, we collect news three years before and three years after the takeover announcement and obtain a sample of 478,830 news articles.

Finally, we merge the M&A deal data with the collected media data, and we collect accounting data from Compustat and stock price data from CRSP databases. To properly estimate the media attitude, we exclude deals without news coverage during the pre-merger period, i.e., 60 days to 3 days before merger announcements. We end with a final sample containing 288 M&A deals.¹

3.2. Variable construction

Media variables

We construct two media variables, i.e., Media Pessimism and Media Coverage. First, we construct the measure for media content analysis. Following the framework of Tetlock (2007) and Tetlock et al. (2008), we choose the ratio of negative words to the total number of words to represent the media attitude of each news article. Similar to the previous literature, each single word in the document-term matrix was categorised into two groups, using positive and negative word categories. Unlike previous studies that use the *Harvard IV-4 Psychosocial Dictionary*, this paper uses Loughran and McDonald's (2011) alternative financial word list. The *Harvard IV-4 Psychosocial Dictionary* was originally developed for psychology and sociology contexts, and it is doubtful whether it applies well to the realm of finance. Loughran and McDonald (2011) provide evidence that the Harvard IV-4 list substantially misclassifies words when used in financial applications. They created a new word category list comprising words with typically negative connotations in a financial context, which is applicable to our study.

¹ The reason we lose a large amount of observations is that most acquirers are not covered by news during the pre-merger period.

For the short-term return analyses, the proxy for media pessimism (Media Pessimism) is the average fraction of negative words in news articles issued during the pre-merger period. The pre-merger period is defined as the period from 60 days to 3 days before merger announcements, which is the same as the one adopted by Fang and Peress (2009) and Ferguson (2015).² We end the pre-merger window at three days before M&A announcements to avoid any overlap between the window used to estimate media variables and that used to calculate CARs around merger announcements. For the long-term performance analyses, the proxy for media pessimism is the average fraction of negative words in news articles issued during the merger period, which is defined as the period from the announcement date to the M&A agreement effective date.

Second, we use the number of news articles issued during the pre-merger period as the proxy for media coverage (Media Coverage) for the short-term return analyses and the media coverage estimated during the merger period for the long-term performance analyses.

Besides the fraction of negative words in each news article, another measure commonly used in the previous literature (e.g., Tetlock, 2007; Tetlock et al., 2008; and Loughran and McDonald, 2011) to assess media attitude is the media pessimism factor, which looks at the number of both positive and negative words. The media pessimism factor is defined as the difference between the number of positive words and the number of negative words, scaled by the sum of positive and negative words. In this study, we choose the fraction of negative words as the main measure of media attitude because the negative word category summarises common variations better than any other single category of words, including positive words (Tetlock, 2007). Measures based on negative words alone present a stronger correlation with stock market performance than those based on other categories. The main explanation is that negative information has

² For a robustness check, we use different windows including (-90, -3), (-60, -3), (-30, -3) and (-30, +30) around the merger announcements dates as the estimation window for media variables, and the results remain similar.

a greater impact on investor behaviour than positive information, a phenomenon explained by a large body of psychology literature (e.g., Baumeister et al., 2001). In a wide range of settings where information is processed, negative information attracts more public attention and induces stronger reactions (Rozin and Royzman, 2001). Another potential explanation is that either the Harvard IV-4 list or Loughran and McDonald's (2011) financial words list has a tendency toward negative words. The word count of the positive list is significantly smaller than that of the negative list, which creates potential bias when used for content analysis.³

Cumulative abnormal returns (CARs) and buy and hold abnormal returns (BHARs)

We follow the standard event study methodology to calculate cumulative abnormal returns (CARs) during a five-day window (CAR[-2,+2]) around the announcement dates.⁴ We estimate the abnormal returns using the Carhart four-factor model (Carhart, 1997) as follows:

$$R_{it} = \alpha_{it} + \beta_{it}(R_m - R_f) + s_{it}SMB_t + h_{it}HML_t + m_{it}Mom_{it} + e_{it}$$

The CARs are calculated by the sum of abnormal returns during the [-2,+2] window:

$$CAR_{it} = \sum AR_{it}$$

To better evaluate a firm's long-term post-merger performance, we calculate the 6-month and 12-month buy and hold abnormal returns (BHARs) for each acquirer. Specifically, BHARs are calculated following Lyon et al. (1999) as follows:⁵

$$BHAR_i = \prod_{t=1}^T (1 + R_{i,t}) - \prod_{t=1}^T (1 + R_{benchmark,t})$$

³ We still use the media pessimism factor as a robustness test. Our results are weaker but still significant. We also check the results of another alternative measure for media attitude developed by Boudoukh et al. (2012), which is defined as the difference between positive and negative words divided by the total number of positive and negative words. The results are generally consistent with those reported in the paper.

⁴ We also calculate CARs for a 3-day window (CAR[-1,+1]) and an 11-day window (CAR[-5,+5]) for robustness reasons. The results are consistent with our main results.

⁵ We also calculate the BHARs for 24-month and 36-month windows for a robustness check, and get similar results.

where we use the returns of the 25 value-weight, non-rebalanced portfolios grouped by both firm size and book-to-market ratio as the benchmarks for expected returns. The p-value is calculated through bootstrapping.

3.3. Sample description

The summary statistics for all of the collected news articles are reported in Table 1. We report the length of the articles and the number of positive and negative words used in both titles (headlines) and content (the body of the articles). Media Pessimism, the last variable reported, is the measure of media pessimism, i.e., the number of negative words over the total number of words. A comparison of the mean and median values for each variable suggests that there is no substantial skewness caused by outliers. The mean and median of media pessimism are 1.74% and 1.47%, respectively, comparable to those reported by Loughran and McDonald (2011), and much lower than those estimated using the Harvard IV-4 word criterion. A reasonable explanation is that Loughran and McDonald's negative words list is only about half the size of the Harvard IV-4 negative list.

Table 2 provides descriptive statistics for both firm and deal characteristics and compares the two subsamples divided according to media attitude (Panel A) and media coverage (Panel B). In Panel A, if a deal has Media Pessimism below the sample median, we classify it as receiving a “positive media attitude,” and otherwise a “negative media attitude.” Throughout the paper, we use this approach to divide the sample into subsamples of positive and negative media attitudes. Acquirer characteristics reported include a firm's growth opportunity (Market-to-Book Ratio), profitability (Profit) and interest coverage ratio (Interest Coverage). There is no significant difference between the deals receiving positive and negative media attitudes across all acquirer characteristics reported, based on either the t-test for the mean value or the Wilcoxon Rank-Sum test for the median value. The comparisons for deal characteristics, including deal size (Deal Value and Relative Size), deal premium (Premium), payment methods (Pure Cash and Pure Stock) and the existence of a competing deal (Compete

Deal), also generally do not present significant differences between the two subsamples. One exception is the deal premium (Premium). Acquirers receiving negative news tend to pay higher premiums for the deal. We explore this phenomenon more in Section 4.5. The mean value of the relative size ratio is statistically significant, but the median value turns out to be insignificant.

In Panel B of Table 2, the sample is divided into two subsamples according to the sample median of Media Coverage. Throughout the paper, we use the sample median to divide the sample into subsamples of high and low media coverage. Compared to the results in Panel A, more variables show significant differences between the two subsamples. First, large acquirers prefer larger targets than small acquirers. Consistent with this, the average deal value of acquirers with high media coverage is significantly higher than that of acquirers with low media coverage. Meanwhile, the comparison of Relative Size—i.e., the ratio of a target's value to its acquirer's value—reveals that acquirers receiving high media coverage, which are also likely to be larger in size, tend to acquire targets of smaller size relative to their own size. The differences in capital structure, measured by interest coverage ratio, between acquirers with high and low media coverage are also distinct. In terms of deal characteristics, deals purely paid in cash and with higher premiums attract higher media coverage.

4. Empirical results

4.1. Univariate analysis for CARs

Table 3 reports the five-day CARs (CAR [-2,+2]) around M&A announcements for acquirers across different media attitudes and payment methods. Panel A of Table 3 reports the CARs for the full sample of acquirers and two subsamples classified by the sample median of Media Pessimism. For all acquirers included in our sample, the five-day CAR is negative (-1.79%) and statistically significant at the 1% level (p-value = 0.0015). When we divide the sample according to media attitude during the pre-merger period, the performances of the two subsamples are statistically different. The average

CAR [-2,+2] for acquirers with a positive media attitude is negative (-0.95%) but statistically insignificant (p-value = 0.3088). The average CAR [-2,+2] for acquirers with a negative media attitude is more negative in magnitude (-2.61%) and highly significant (p-value = 0.0003). Comparison between the two subsamples reveals that the CARs for acquirers with a positive media attitude are 1.66% higher (significant at the 10% level with a p-value = 0.0688) than those for acquirers with a negative media attitude. This finding is consistent with our first hypothesis that media pessimism leads to lower market returns around M&A announcements. Investors react more favourably to M&As receiving positive news during the pre-merger period.

Loughran and Vijh (1997) and Moeller et al. (2007) both suggest a relation between methods of payment for takeovers and acquirer abnormal returns over both the short and long term. Thus, we further explore whether the short-term CARs around the announcements differ according to the method of payment in M&As. Specifically, we divide our full sample into three subsamples according to payment methods: pure cash payments, pure stock payments and mixed payments. Generally, the results show that the average of the CARs for deals purely paid in cash is negative (-0.66%) but insignificant (p-value = 0.1477). Also, for deals purely paid in cash, there is no significant differences in CARs between the subsamples with positive and negative media attitudes. These findings are consistent with Moeller et al. (2004), who document that cash offers are marked by insignificant positive abnormal returns, while other acquisitions have significant negative abnormal returns. According to Moeller et al. (2004), small firms are more likely to pay in cash in M&As and on average record higher abnormal returns in M&As than big firms. In summary, media attitudes during the pre-merger period do not have obvious effects on short-term market reactions to deals purely paid in cash.

In contrast, the average of the CARs for takeovers paid in stocks is negative (-4.24%) and significant at the 1% level (p-value = 0.0042). This result is consistent with Travlos (1987) and Martin (1996), both of whom show that abnormal returns around the

announcement of deals paid in stocks are significantly negative. Comparison between the two subsamples indicates that acquirers with a positive media attitude receive 1.66% higher CARs than acquirers with a negative media attitude. However, the t-test suggests that the difference is insignificant.

Moreover, the results of deals paid both in cash and stocks are similar to the results of the full sample. The average of the CARs is -1.77% and statistically significant (p-value = 0.0267). For acquirers with a positive media attitude, the average of the CARs is slightly positive (0.25%) but insignificantly different from zero (p-value = 0.8154). In contrast, the average of the CARs of acquirers with a negative media attitude is negative (-3.75%) and significant at the 1% level (p-value = 0.0014). The 4.00% difference in CARs between the two subsamples is also significant at the 5% level (p-value = 0.0105).

Panel B of Table 3 presents the CARs for acquirers with different media coverage and payment methods. The average CARs for the subsample with high media coverage and the subsample with low media coverage are both negative (-1.28% and -2.24%) and significant (p-values = 0.0153 and 0.0024). The difference between the two subsamples is 0.96% but insignificant (p-value = 0.2825). We next examine whether payment methods cause any differences. While deals paid in stocks on average receive more negative market reactions for both high and low media coverage subsamples, the differences between the two subgroups are insignificant for all payments methods. These findings imply that the pre-merger media coverage does not affect market reactions to M&A announcements.

4.2. Regression analysis for CARs

The univariate analyses in Table 3 support our argument that media attitude during the pre-merger period influences market reactions to takeover announcements, while media coverage does not display any significant effect on announcement returns. Next, we adopt multivariate regressions to control for firm and deal characteristics that also influence market reactions to M&A announcements.

In the regression models of Table 4, we use the five-day CARs around the takeover announcements (CAR[-2,+2]) as the dependent variable. The first regression model includes only our variables of interest, i.e., Media Pessimism and Media Coverage. Consistent with our prediction, the coefficient on Media Pessimism is negative (-0.9362) and statistically significant (p-value = 0.0545). This finding suggests that media pessimism decreases the CARs around takeover announcements. As for media coverage, the coefficient on Media Coverage is positive (0.0054) but insignificant (p-value = 0.1299). The results of Model (1) are consistent with those of the univariate analyses. The market reactions to the takeover announcements vary according to media attitude but are unrelated to media coverage during the pre-merger period.

In regression Model (2), we include a number of deal and firm characteristics that have been identified to influence announcement returns in previous studies. Malmendier and Tate (2005, 2008) show that overpaid takeovers have significantly lower abnormal returns around announcement. To control for this effect, the bid premium (Premium) is included in the regression model. Several studies show that payment method is one of the dominant factors influencing acquirers' abnormal announcement returns. For example, Travlos (1987) and others indicate that acquisitions of public targets paid in pure cash are accompanied by higher announcement returns. Thus, a dummy variable that equals one for deals purely paid in cash (Pure Cash) is included in the model to control for the effect of payment methods.

For firm characteristics, we control for acquirers' capital structure and market-to-book ratio. Maloney et al. (1993) find that bidders bearing more debt have higher announcement returns. Our regression model uses interest coverage (Interest Coverage) to proxy for acquirers' debt burden. Lang et al. (1991) and Servaes (1991) both reveal a positive relation between the acquirer's market-to-book ratio, a proxy for future growth opportunities, and announcement returns. We calculate the market-to-book ratio as the ratio of the firm's market value of assets over the book value and include it in

Model (2). Furthermore, the relative size between the target and the acquirer is also an indispensable control variable in previous M&A studies (e.g., Asquith et al., 1983; Travlos 1987). Thus, Relative Size is also controlled in Model (2).

The regression results of Model (2) are reported in Table 4. The negative correlation between the announcement CARs and media pessimism remains significantly negative. The coefficient on Media Pessimism is -1.5047 and statistically significant at the 1% level (p-value = 0.0048). As for economic magnitude, a one standard deviation increase in Media Pessimism (0.0138) leads to a -2.1% abnormal return during the five-day window around M&A announcement. Moreover, the coefficient on Media Coverage is still insignificant (p-value = 0.8089).

Among the control variables, only the coefficients on Interest Coverage and Relative Size are statistically significant. We document a significantly positive correlation between Interest Coverage and announcement CARs (0.0949, p-value = 0.0789), which is consistent with the argument of Masulis et al. (2007) that debtholders play a governance role and thus improve the efficiency of firms' M&A decisions. The results suggest that a higher Relative Size leads to significantly lower announcement CARs (-0.0844, p-value = 0.0001), which is consistent with Ramaswamy and Waagelein (2003), who interpret the negative correlation to mean that firms acquiring relatively larger firms have a more difficult time digesting those firms, leading to ineffective assimilation into the company's operations.

To summarise, the empirical results of both the univariate and multivariate regression analyses indicate that media pessimism during the pre-merger period leads to more negative market reactions to M&A announcements, which supports our first hypothesis. Meanwhile, we do not find any evidence that media coverage influences acquirers' short-term stock performance around M&A announcements.

4.3. Univariate analysis for BHARs

So far, this paper has investigated the interaction between media and short-term returns around takeover announcements. This section explores the relation between media during the event window and acquirers' post-merger performance. We use BHARs accumulated for 12 months after M&As' effective date to measure acquirers' long-term stock performance.

Table 5 reports acquirers' 12-month BHARs for the full sample and for subsamples divided according to media pessimism (reported in Panel A) and media coverage (reported in Panel B). The average of the BHARs for the full sample is negative (-14.59%) and statistically significant at the 1% level ($p\text{-value} = 0.0001$). This finding is consistent with Loughran and Vijh (1997), who argue that firms buying public targets suffer substantial losses in future stock performance. We next examine whether payment methods matter. For deals using pure cash, acquirers' 12-month BHAR is -6.62% on average. This is much better than the return for deals using the two other payment methods; for both deals purely paid in stock and those with a mixed payment method, the long-term BHARs are negative (-22.46% and -19.76%) and statistically significant ($p\text{-value} = 0.0056$ and 0.0005).

When the full sample is divided according to the sample median of Media Pessimism during the event window, acquirers' long-term performances do not show significant differences between the two subsamples, except for deals purely paid in cash. For pure cash deals receiving positive news, the average BHAR for acquirers is not significantly different from zero ($p\text{-value} = 0.9893$). The average BHAR for acquirers with a positive media attitude is 13.24% larger than that for pure cash deals receiving negative news, and the difference is statistically significant ($p\text{-value} = 0.0885$). For deals using the other two payment methods, the long-term performance of acquirers does not differ significantly between the subgroups with positive and negative media attitudes.

We report the comparison of BHARs between subgroups with high and low media coverage in Panel B of Table 5. Similar to the findings of the short-term CAR analyses,

there are no significant differences in BHARs between the subsamples with high and low media coverage, which indicates that media coverage cannot predict acquirers' long-term performance.

To sum up, we find that media pessimism in the event window period predicts low long-term stock returns for acquirers. However, media coverage has no predictive power for acquirers' long-term performance.

4.4. Regression analysis for BHARs

Next, we use multivariate regression analysis to further investigate the relation between media and acquiring firms' long-term stock performance. Table 6 presents the results of the multivariate regressions. The dependent variables for the two regression models are the 6- and 12-month BHARs of acquiring firms after M&As, respectively. Similar to the CAR regression models, the regression models control for deal characteristics including the bid premium (Premium), cash payment (Pure Cash) and targets' size relative to acquirers' size (Relative Size). In addition, we control for acquirer characteristics proxied by interest coverage (Interest Coverage), profitability (Profit) and the market-to-book ratio (Market-to-Book Ratio).

The coefficients on Media Pessimism in the two models are both negative (-5.0076 and -10.884) and significant at the 10% level (p-value = 0.0842 and 0.0717). The empirical results indicate that a one standard deviation increase in Media Pessimism (0.0138) leads to 6.9% and 15.0% loss in the 6-month and 12-month periods after M&As. However, the coefficients on Media Coverage are statistically insignificant in both models. These findings suggest that media attitude during the event window has predictive power for acquirers' future stock performance. However, there is no evidence that media coverage correlates to acquirers' post-merger long-term performance.

Furthermore, the empirical evidence suggests a significantly negative correlation between Market-to-Book Ratio and BHARs in both models, with coefficients that are

equal to -0.0123 and -0.067, respectively, and significant (p-value = 0.0825 and 0.0001), consistent with the argument that growth stocks underperform value stocks. In addition, the coefficients on Profit and Pure Cash are significantly positive in Model (2), but insignificant in Model (1).

In conclusion, the above analyses show that acquiring firms' long-term BHARs can be predicted by news attitude during the M&A period. Tetlock et al. (2008) argue that the financial news media is able to forecast a firm's future earnings and stock returns, which suggests that media attitude is related to a firm's fundamental information. In the setting of an M&A, media closely tracks the takeover progress during the period from the announcement date to the effective date, and release news containing value-relevant information. Our empirical evidence supports our expectation that news pessimism has predictive power over whether a takeover deal benefits the acquiring firm's shareholders in the long term. However, media coverage during the M&A period cannot predict the future performance of acquiring firms. These findings are particularly useful for capital market investors developing a long-term portfolio strategy. For M&As involving acquirers about whom media attitudes are negative, capital market investors should be more cautious and consider discounting the stock value to a greater extent.

4.5. Premium analysis

Our study on acquirers' short-term abnormal returns and long-term stock performance demonstrates the interaction between the financial media and M&A performance. This section further examines the relation between the pre-merger media and bid premiums. Buehlmaier (2013) argues that the media can mitigate the information asymmetry between target shareholders and bidding firms. Buehlmaier (2013) shows that good news improves acquirer ratings by target shareholders and encourages them to accept takeover offers. Thus, a positive media attitude can predict takeover success. In terms of bid premiums, we expect that media pessimism during the pre-merger period has a negative effect on target shareholders' perceptions of deal success, which forces acquirers to pay higher premiums to compensate for target shareholder risks. To

examine whether our expectation is correct, we regress bid premiums on the measures for media attitude and media coverage, along with the control variables.

Table 7 presents the regression results, with the premium paid by acquirers for target shares (Premium) as the dependent variable. Model (1) only includes Media Pessimism and Media Coverage, and Model (2) further include control variables. Consistent with our expectation, the coefficient on Media Pessimism is positive (3.3359 and 3.8314) and statistically significant at the 10% level (p-value = 0.0978 and 0.0773) in both columns, indicating that a more pessimistic media attitude leads to higher bid premiums. These results imply that an acquiring firm's managers must raise their bid price to offset the media's negative effect on target shareholders' perceptions. The coefficients on Media Coverage are also positive (0.0290 and 0.0343) and statistically significant at the 5% to 10% level (p-value = 0.0523 and 0.0337) in both models, which suggests that acquirers attracting higher media coverage tend to pay higher premiums in takeovers. In conclusion, the analyses on bid premiums show that news during the pre-merger period has a significant impact on the premiums paid by acquiring firms to target shareholders. The empirical results suggest that more pessimistic media attitudes and higher media coverage are related to higher bidding premiums.

In this study, we show that pessimistic media reports about acquirers during the pre-merger period lead to acquirers paying higher premiums and investors reacting more negatively around deal announcements. In addition, media pessimism during the M&A period predicts worse long-term stock performance of the acquirers.

5. Conclusion

This paper examines the interaction between the financial media and M&A performance. The previous literature shows that both media attitude and media coverage affect firm stock performance. However, this finding has not been applied to

the M&A context. This paper addresses the issue by examining whether the financial media affects or predicts takeover returns in both the short and long term.

First, this paper provides empirical evidence that the attitude of financial news appearing during the pre-merger period affects financial market reactions to takeover deal announcements. We find that a more pessimistic media attitude during the pre-merger period leads to significantly lower five-day CARs of acquirers around M&A announcements. This result holds in both univariate and multivariate regression analyses.

Second, this paper also investigates the relation between financial media and acquirers' long-term stock performance after M&As. We document a significant correlation between media pessimism during the merger period and acquirers' long-term BHARs after M&As in both univariate and multivariate analyses. The predictive power of media attitude for long-term returns is consistent with the argument that the media is able to report undisclosed, fundamental information about acquirers, thus helping to resolve the problem of information asymmetry between firms and investors. However, we fail to find any evidence that media coverage influences either short-term or long-term M&A performance.

Furthermore, the regression on bid premium shows that bid premiums are also affected by financial news during the pre-announcement period. When the shareholders of target firms are influenced by pessimistic news, acquirers have to boost their bid prices to compensate them.

Our comprehensive study on the role of financial media in M&As complements the existing literature on both M&As and media. Our results imply that investors can learn from the content of news, and for M&A events, media content is more important than media coverage in predicting future returns. Due to data availability issues, however, our empirical tests are based on a relatively small sample. The sample could be enlarged

by expanding our media source to include local newspapers or digital media. This study also raises unanswered questions that could be clarified by future research. For instance, what accounts for the diversity of financial media attitudes found in different news sources, and what are the implications of such differences in terms of the effect on investors? This would be an interesting avenue for future studies.

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Table 1

Descriptive statistics for media data.

Variables	Mean	Median	SD	10 percentile	90 percentile
News Length	629.29	525	461.92	185	1164
Title Positive	0.1386	0	0.3792	0	1
Title Negative	0.3029	0	0.5915	0	1
Content Positive	5.3203	4	5.6692	0	13
Content Negative	10.9852	8	12.0129	1	25
Media Pessimism	0.0174	0.0147	0.0138	0.0026	0.0348

Note: This table shows descriptive statistics for all 478,830 media articles collected. News Length is the number of total words in each news article. Title Positive and Title Negative are the number of positive and negative words in each news title, respectively. Content Positive and Content Negative are the number of positive and negative words in each news article, respectively. Media Pessimism is the fraction of negative words to total number of words in each news article.

Table 2

Descriptive statistics of deal and acquirer characteristics.

Panel A Descriptive statistic for the full sample and comparison between subsamples with positive and negative attitude.

Variable	Full Sample			Positive Attitude			Negative Attitude			T-test	Wilcoxon Rank-Sum Test
	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	P-Value	P-Value
Market-to-Book Ratio	255	3.192	2.100	124	3.479	2.154	131	2.921	2.092	0.3695	0.7559
Profit	286	0.156	0.159	141	0.153	0.168	145	0.158	0.153	0.6456	0.1940
Interest Coverage	263	0.091	0.057	124	0.095	0.065	139	0.087	0.049	0.5214	0.1227
Deal Value	288	2962.6	887.7	142	2798.2	976.3	146	3122.5	864.3	0.6811	0.4802
Relative Size	255	0.191	0.080	124	0.227	0.083	131	0.157	0.073	0.0572	0.7559
Premium	278	0.334	0.272	137	0.303	0.236	141	0.365	0.301	0.0844	0.0211
Pure Cash	288	38.80%	-	142	40.14%	-	146	45.21%	-	0.3850	-
Pure Stock	288	22.78%	-	142	22.54%	-	146	17.81%	-	0.3173	-
Compete Deal	281	6.05%	-	137	6.57%		144	5.55%	-	0.8954	-

Table 2 Continued from previous page.

Panel B Comparison between subsamples with high and low media coverage.

	Low Media Coverage			High Media Coverage			T-Test	Wilcoxon Rank-sum Test
	Obs.	Mean	Median	Obs.	Mean	Median	P-Value	P-Value
Market-to-Book Ratio	134	2.875	1.738	121	3.544	2.329	0.2822	0.0006
Profit	152	0.146	0.152	134	0.166	0.165	0.0627	0.1558
Interest Coverage	139	0.113	0.077	124	0.066	0.045	0.0002	0.0004
Deal Value	154	1958.6	793.6	134	4116.5	1090.3	0.0095	0.1570
Relative Size	134	0.266	0.144	121	0.107	0.027	0.0001	0.0001
Premium	154	0.305	0.235	134	0.369	0.279	0.0786	0.0068
Pure Cash	154	35.71%	-	134	50.75%	-	0.0101	-
Pure Stock	154	23.38%	-	134	16.42%	-	0.1419	-
Compete Deal	154	3.90%	-	134	8.21%	-	0.1313	-

Note: This table presents firm and M&A deal characteristics for acquiring firms from 2000 to 2015. Panel A includes the descriptive statistics for the full sample and two subsamples that are classified by the sample median of Media Pessimism. Panel B reports the comparison results for the two subsamples divided by the sample median of Media Coverage. Market-to-Book ratio is the ratio of the firm's market value divided by its book value. Profit is earnings before interest, taxes, depreciation, and amortisation (EBITDA) over total assets. Interest Coverage is the ratio of interest expenses over earnings before interest and taxes. Deal Value is the total amount paid by acquirers recorded in SDC. Relative Size is the total value of the target over acquirers. Premium is the four-week premium of each deal recorded by the SDC database. Pure Cash is an indicator that equals one if the deal is paid 100% in cash, and zero otherwise. Pure Stock is an indicator that equals one if the deal is paid 100% in stock, and zero otherwise. Compete Deal is an indicator that equals one if there exists a competing deal, and zero otherwise. This table also provides results of a t-test for the difference of mean value and the Wilcoxon Rank-Sum Test for the difference of median value between the two subsamples.

Table 3

Univariate analysis for CARs.

Panel A CAR[-2, +2] for the full sample and comparison between subsamples with positive and negative attitude.

	Full Sample			Positive Media Attitude			Negative Media Attitude			Differences	
	Obs.	Mean	P-Value	Obs.	Mean	P-Value	Obs.	Mean	P-Value	Mean	P-Value
All Deals	288	-1.79%***	0.0015	120	-0.95%	0.3088	168	-2.61%***	0.0003	1.66%*	0.0688
Pure Cash	123	-0.66%	0.1477	58	-0.63%	0.7807	65	-0.69%	0.4533	0.06%	0.9509
Pure Stock	58	-4.24%***	0.0042	25	-3.49%*	0.0751	33	-5.15%***	0.0040	1.66%	0.5659
Mixed	107	-1.77%**	0.0267	39	0.25%	0.8154	68	-3.75%***	0.0014	4.00%**	0.0105

Panel B Comparison of CAR[-2,+2] between subsamples with high and low media coverage.

	High Media Coverage			Low Media Coverage			Differences	
	Obs.	Mean	P-Value	Obs.	Mean	P-Value	Mean	P-Value
All Deals	127	-1.28%**	0.0153	161	-2.24%***	0.0024	0.96%	0.2825
Pure Cash	51	-0.57%	0.3252	72	-0.77%	0.2936	0.20%	0.8281
Pure Stock	20	-3.35%*	0.0646	38	-4.77%**	0.0253	1.42%	0.5969
Mixed	56	-1.34%	0.1804	51	-2.07%*	0.0772	0.74%	0.6272

Note: This table shows the five-day cumulative abnormal returns (CAR[-2,+2]) of acquirers around the takeover announcements. The abnormal return is measured using the Carhart (1997) model, and the estimate period is [-346, -91]. Panel A reports the CARs of the full sample and two subsamples divided by the sample median of Media Pessimism. Panel B reports the comparison results between the two subsamples divided by the sample median of Media Coverage. Pure Cash refers to the subsample of deals paid purely in cash. Pure Stock refers to the subsample of deals paid purely in stocks. Mixed refers to the subsample of the rest of the deals. This table also provides results of the t-test for the difference of mean values between subgroups. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively.

Table 4

Multivariate regression of CARs.

	CAR[-2,+2]			
	Model (1)		Model (2)	
	Coefficient	P-Value	Coefficient	P-Value
Intercept	-0.0121	0.2435	0.0101	0.6235
Media Pessimism	-0.9362*	0.0545	-1.5047***	0.0048
Media Coverage	0.0054	0.1299	0.0010	0.8089
Premium			-0.0224	0.1430
Interest Coverage			0.0949*	0.0789
Profit			0.0593	0.3702
Pure Cash			0.0047	0.6652
Relative Size			-0.0844***	0.0001
Market-to-Book Ratio			0.0003	0.8896
Adjusted R-Squared	0.175		0.128	
Obs.	288		226	

Note: This table shows multivariate regressions with the five-day cumulative abnormal returns (CAR[-2,+2]) of acquirers around the takeover announcements as the dependent variable. Both the coefficients and p-values are reported. Media Pessimism is the average fraction of negative words for all articles reported during the pre-merger period for each acquirer. Media Coverage is the average number of news articles reported during the pre-merger period for each acquirer. Premium is the four-week premium of each deal recorded by the SDC database. Interest Coverage is the ratio of a firm's EBITDA over its interest expense. Profit is the ratio of EBITDA over total assets. Pure Cash refers to the subsample of deals paid purely in cash. Relative Size is the total value of the target over acquirers. Market-to-Book ratio is the ratio of firm's market value of assets over its book value. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively. The specific models are as follows:

Model 1

$$CAR[-2, +2] = \beta_0 + \beta_1 \text{Media Pessimism} + \beta_2 \text{Media Coverage} + \varepsilon$$

Model 2

$$CAR[-2, +2] = \beta_0 + \beta_1 \text{Media Pessimism} + \beta_2 \text{Media Coverage} + \beta_3 \text{Premium} \\ + \beta_4 \text{Interest Coverage} + \beta_5 \text{Profit} + \beta_6 \text{Pure Cash} + \beta_7 \text{Relative Size} \\ + \beta_8 \text{Market} - \text{to} - \text{Book Ratio} + \varepsilon$$

Table 5

Univariate analysis for BHARs.

Panel A BHAR[+25,+252] for the full sample and comparison between subsamples with positive and negative attitude.

	Full Sample			Positive Media Attitude			Negative Media Attitude			Differences	
	Obs.	Mean	P-Value	Obs.	Mean	P-Value	Obs.	Mean	P-Value	Mean	P-Value
All Deals	284	-14.59%***	0.0001	120	-12.20%***	0.0081	164	-17.93%***	0.0001	5.73%	0.3570
Pure Cash	123	-6.62%*	0.0836	57	-0.08%	0.9893	66	-13.33%***	0.0074	13.24%*	0.0885
Pure Stock	54	-22.46%***	0.0056	22	-17.46%	0.1370	32	-30.25%***	0.0096	12.79%	0.4245
Mixed	107	-19.76%***	0.0005	39	-21.21%***	0.0059	68	-18.00%**	0.0433	-3.21%	0.7770

Panel B Comparison of BHAR[+25,+252] between subsamples with high and low media coverage.

	High Media Coverage			Low Media Coverage			Differences	
	Obs.	Mean	P-Value	Obs.	Mean	P-Value	Mean	P-Value
All Deals	123	-12.62%***	0.0009	161	-17.38%***	0.0006	4.76%	0.4438
Cash	48	-8.36%	0.1159	75	-6.00%	0.3049	-2.36%	0.7622
Stock	20	-25.11%*	0.0589	34	-21.93%**	0.0409	-3.18%	0.8446
Mixed	55	-12.58%**	0.0209	52	-26.94%***	0.0087	14.35%	0.2033

Note: This table shows the 12-month buy-and-hold abnormal returns (BHAR[+25,+252]) for all acquirers after the deal is completed. The abnormal return is estimated using the Carhart (1997) model, and the estimation window is [-346, -91]. Panel A reports the BHARs of the full sample and two subsamples divided by the sample median of Media Pessimism. Panel B reports the comparison results between two subsamples divided by the sample median of Media Coverage. Pure Cash refers to the subsample of deals paid purely in cash. Pure Stock refers to the subsample of deals paid purely in stocks. Mixed refers to the subsample of the rest of the deals. This table also provides results of the t-test for the difference of mean values between subgroups. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively.

Table 6

Multivariate regression analysis for BHARs.

Dependent variable	BHAR[+25, +126]		BHAR[+25, +252]	
	Model (1)		Model (2)	
	Coefficient	P-Value	Coefficient	P-Value
Intercept	0.0333	0.6993	-0.1049	0.5596
Media Pessimism	-5.0076*	0.0842	-10.884*	0.0717
Media Coverage	-0.0119	0.4121	0.0465	0.1230
Premium	0.0732	0.2032	-0.0378	0.7516
Interest Coverage	-0.3295	0.1297	0.7156	0.1143
Profit	0.2102	0.3993	1.0599**	0.0421
Pure Cash	0.0532	0.1961	0.1437*	0.0941
Relative Size	0.0344	0.6416	-0.0446	0.7721
Market-to-Book Ratio	-0.0123*	0.0826	-0.0670***	0.0001
Adjusted R-Squared	0.129		0.161	
Obs.	221		221	

Note: This table shows multivariate regressions with the 6- and 12-month buy-and-hold abnormal returns (BHAR[+25,+126] and BHAR[+25,+252]) for all acquirers after the deal is completed as the dependent variables. Both the coefficients and p-values are reported. Media Pessimism is the average fraction of negative words for all articles reported during the pre-merger period for each acquirer. Media Coverage is the average number of news articles reported during the pre-merger period for each acquirer. Premium is the four-week premium of each deal recorded by the SDC database. Interest Coverage is the ratio of a firm's EBITDA over its interest expense. Profit is the ratio of EBITDA over total assets. Pure Cash refers to the subsample of deals paid purely in cash. Relative Size is the total value of the target over acquirers. Market-to-Book ratio is the ratio of firm's market value of assets over its book value. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively. The specific models are as follows:

Model 1

BHAR[+25, +126]

$$= \beta_0 + \beta_1 \text{Media Pessimism} + \beta_2 \text{Media Coverage} + \beta_3 \text{Premium} \\ + \beta_4 \text{Interest Coverage} + \beta_5 \text{Profit} + \beta_6 \text{Pure Cash} + \beta_7 \text{Relative Size} \\ + \beta_8 \text{Market} - \text{to} - \text{Book Ratio} + \varepsilon$$

Model 2

BHAR[+25, +252]

$$= \beta_0 + \beta_1 \text{Media Pessimism} + \beta_2 \text{Media Coverage} + \beta_3 \text{Premium} \\ + \beta_4 \text{Interest Coverage} + \beta_5 \text{Profit} + \beta_6 \text{Pure Cash} + \beta_7 \text{Relative Size} \\ + \beta_8 \text{Market} - \text{to} - \text{Book Ratio} + \varepsilon$$

Table 7

Multivariate regression analysis for bid premium.

	Model (1)		Model (2)	
	Coefficient	P-Value	Coefficient	P-Value
Intercept	0.2683***	0.0001	0.1320**	0.0298
Media Pessimism	3.3359*	0.0978	3.8314*	0.0773
Media Coverage	0.0290*	0.0523	0.0343**	0.0337
Tender Offer			0.2460***	0.0001
Pure Stock			0.0403	0.4534
Compete Deal			-0.0803	0.3268
Profit			0.2886	0.1851
Market-to-Book Ratio			0.0003	0.9437
Adjusted R-Squared	0.183		0.224	
Obs.	278		246	

Note: This table shows multivariate regressions with the four-week bid premium as the dependent variable. Both coefficients and p-values are reported. Media Pessimism is the average fraction of negative words for all articles reported during the pre-merger period for each acquirer. Media Coverage is the average number of news articles reported during the pre-merger period for each acquirer. Tender Offer is an indicator that equals one if the acquirer makes a tender offer for a target, and zero otherwise. Pure Stock is an indicator that equals one if the deal is paid 100% in stock, and zero otherwise. Compete Deal is an indicator that equals one if there exists a competing deal, and zero otherwise. Profit is the ratio of EBITDA over total assets. Pure Cash refers to the subsample of deals paid purely in cash. Relative Size is the total value of the target over acquirers. Market-to-Book ratio is the ratio of firm's market value of assets over its book value. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively. The specific models are as follows:

Model 1

$$\text{Premium} = \beta_0 + \beta_1 \text{Media Pessimism} + \beta_2 \text{Media Coverage} + \varepsilon$$

Model 2

$$\begin{aligned} \text{Premium} = & \beta_0 + \beta_1 \text{Media Pessimism} + \beta_2 \text{Media Coverage} + \beta_3 \text{Tender Offer} \\ & + \beta_4 \text{Pure Stock} + \beta_5 \text{Compete Deal} + \beta_6 \text{Profit} + \beta_7 \text{Market} - \text{to} \\ & - \text{book Ratio} + \varepsilon \end{aligned}$$