

Earnings Management Surrounding Takeover Rumours

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A Thesis

In

The John Molson School of Business

Presented in Partial Fulfillment of the Requirements

For the Degree of Master of Science in Administration (Finance) at

Concordia University

Montréal, Québec, Canada

January 2018

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CONCORDIA UNIVERSITY

School of Graduate Studies

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Master of Science in Administration (Finance Option)

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Abstract

I investigate whether firms manage earnings in proximity to initially published rumours of their impending takeover. Utilizing a unique sample of 1,831 takeover rumours, I find that rumoured target firms inflate their earnings prior to the rumour's publication. Rumours which are more likely to be anticipated by the target firm (rumours initiated by targets, rumours concerning financial distress, and rumours concerning the hiring of a financial advisor) provide stronger associations with earnings management than do other rumour types. I interpret results as consistent with rumored target firms attempting to benefit from higher takeover valuations if takeover bids are indeed forthcoming

Keywords: earnings management; media coverage; mergers and acquisitions; rumours.

Acknowledgement

The completion of this thesis marks the end of an amazing and exciting two and half years spent in Montreal, and there are many good friends and advisors I have to thank for that. First, I would like to thank the merciful God for all the gifts he has offered me, May all the honour and glory belong to him. I would also like to express my gratitude to my supervisor, Dr. Frederick Davis, for his experienced guidance, encouraging attitude, responsiveness, and countless support. I am grateful to my friends that I have met in China and Montreal. They are all great people and I thank them for the love, encouragement, inspiration, and joy they have given me. Last but not least, I would like to thank my family, my parents and brother. I would not have completed my study without their unconditional love and support.

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1. Instruction

Within the context of mergers and acquisitions, the ability to subjectively manipulate accounting results is an important issue. Erickson and Wang (1999), Louis (2004), and Gong (2008) all find that acquirers engaging in stock swap mergers are likely to increase their earnings prior to the merger announcement date in order to increase their stock price, thus lowering the value paid to the corresponding target firm. There is, however, a dearth of studies focusing on whether the target itself also engages in earnings management practices in an attempt to receive higher premiums; this may be because prior to a takeover announcement it is difficult for target firms to identify and time the acquisition deal (Erickson and Wang, 1999), and thus too late for the target firm to engage in any earnings manipulation.

This paper addresses this issue by analyzing an event which precedes takeover announcements, namely the first published instance of an article clearly indicating that a certain firm is a potential takeover candidate. Specifically, I use a sample of 1,831 takeover rumours constructed by Betton, Davis, and Walker (2017) to determine whether firms who may reasonably expect impending takeover offers engage in earnings management to increase the value of such offers made.

Earnings management is a process whereby managers utilize accounting techniques, such as reporting fictional revenues, delaying expenses, writing-off assets, and opportunistic estimation to manage earnings, typically upward. Such procedures are legal providing managers remain within the limits of Generally Accepted Accounting Principles (GAAP), as GAAP provides managers with some discretion in the management of their firm's earnings and allows managers to determine whether reported earnings should be aggressive or conservative. While such procedures do not affect cash flow, they do impact firms' earnings before interest, taxes, depreciation, and

amortization (EBITDA), and EBITDA is widely used by investment bankers to evaluate both acquisition partners and acquisition premiums (Louis, 2004).

Earnings management activities are not costly to implement as they can be completed without destructive economic events. However, detecting earnings management is costly. For markets and investors, it is hard to identify and qualify the extent to which managers use earnings management. For acquirers, the board or management team can hire advisors, experts, and experienced auditors to detect and qualify earnings management. The detection process is, however, time-consuming and the cost of detection can be a significant burden for firms about to go through a merger.

To analyze the earnings management of target firms rumoured to be subject to an impending takeover, I investigate two major research questions. First, I examine whether rumoured target firms manipulate their accounting earnings upward prior to the rumour release date. Second, I examine whether specific types of rumours are more strongly related to earnings management, as they may represent cases in which the connection to potential future takeover activity is very evident to the target firm. Specifically, I hypothesize that rumours which are initiated by the target, rumours which indicate a financial advisor was hired by the target, and rumours suggesting the target firm is in financial distress will provide the strongest associations with earnings management, as target firms are more likely to anticipate such rumours and thus manipulate earnings accordingly.

I analyze a sample, constructed by Betton, Davis, and Walker (2017), with 1,831 initial rumours from 2002 to 2011 merged with the *Compustat* dataset for necessary accounting fundamental data. Consistent with previous studies, I use the difference between total accruals and estimated accruals as a proxy for earnings management. Following Erickson and Wang (1999), the Jones Model is applied to estimate accruals.

The results suggest that firms do indeed manipulate their earnings upward in pre-rumour quarters. Significant results are found in both aggregated and separated time levels. Furthermore, I provide evidence of the sources of documented earnings management. Results further indicate that as hypothesized, firms are more likely to participate in earnings management in pre-rumour quarters when the rumors themselves are more easily anticipated.

To consolidate my results, I construct a matched sample for my rumoured sample firms and test whether the earnings management levels differ significantly. The results indicate that the earnings management levels of rumoured target firms are significantly higher than that of firms from the matched sample. Furthermore, I develop a robustness test by adjusting estimated accruals through a performance match approach in order to eliminate the possibility that results are exclusively dependent upon the Jones Model. I test my hypotheses again and the results are consistent with those of my previous tests.

Pre-rumour period evidence of earnings management by rumoured target firms provides several contributions to extant studies. First, it contributes to our understanding of the earnings management activities of rumoured target firms in a merger and acquisition setting, thereby allowing us to have a better understanding of firms' corporate events. In addition, it contributes to our understanding of how firms use media coverage to their benefit in the context of mergers and acquisitions.

The rest of this paper is organized as follows: Section 2 gives a review of previous studies, Section 3 presents the two major hypotheses, Section 4 reports the sample and descriptive statistics, Section 5 presents the methodology used to estimate earnings management, Section 6 displays the empirical results, Section 7 discusses the robustness tests, and Section 8 presents the conclusions.

2. Literature

2.1 Earnings Management

Earnings management is a common phenomenon among publicly traded firms. Earnings management refers to the accounting techniques used to refine financial reports and change apparent firm performance to satisfy the interests of shareholders and creditors of firms. Generally Accepted Accounting Principles (GAAP) offers managers flexibility and opportunities to apply accounting choices to manage earnings. This then benefits the firm and increases its wealth (Pornsit et al., 2008). Thus, companies have the potential to use earnings management to smooth out fluctuations in earnings, resulting in a bright prospect for the firms' futures. This is often received positively by the public, leading to an increase in share price (Erickson and Wang, 1999). Earnings management activities are observed in a wide spectrum of settings. Extant studies find firms tend to manipulate their earnings prior to certain corporate events, such as initial public offerings (IPOs) (Teoh, Welch, and Wong, 1998), seasoned equity offerings (SEOs) (Shivakumar, 2000), and open-market repurchases (Gong, Louis and Sun, 2008), and Lie, 2005).

Prior studies have also observed earnings management within the context of mergers and acquisitions. Erickson and Wang (1999) find that acquirers who are engaging in stock for stock mergers are likely to increase their earnings in the period prior to the announcement date of the merger agreement. They also state that target firms also have incentives to increase their earnings prior to the merger announcement date. They detected positive unexpected accruals during the pre-merger period, but they have not proven these unexpected accruals are significantly different from zero. However, these insignificant results may be due to the timing of the acquisitions. They state that acquirers have more flexibility and time to identify targets and initiate the negotiations. For

target firm managers, however, it is too late for them to manage their earnings once the acquirer initiates the bid.

Louis's (2004) finding is consistent with previous studies. He contends that bidders tend to inflate their earnings preceding the stock swap announcement in order to raise their stock price. He then finds a reverse relationship between pre-merger earnings management and post-merger long-term stock performance. Jensen (2005) asserts that overvalued firms in a merger tend to inflate their earnings to meet the market expectation. Furthermore, Easterwood (2011) suggests that managers of firms which are faced with the threat of takeover, especially that of a hostile takeover, have strong incentives to manage reported earnings. Those firms attempt to inflate their reported earnings to prevent shareholders from supporting takeovers. He finds that targets of hostile takeovers tend to inflate earnings prior to the initiation of hostile takeovers. Baik, Kang and Morton (2007) find that when acquirers are faced with higher estimation of risk, such as in acquisitions of privately owned targets in different industries, they are more likely to have higher abnormal accruals.

Previous studies also focus on earnings management in management buyouts. DeAngelo (1986) posits that managers tend to manipulate reported earnings prior to management buyouts. However, he finds no evidence for pre-buyout earnings management. In contrast, Perry and Williams (1994) find significant evidence of downward managerial manipulation of reported earnings in the period prior to management buyout because management has strong incentives to reduce the purchase price. Meulbroek (1992) observes significant run-ups in target firm stock price a month prior to initial merger announcements and tender offer announcements. However, these run-ups are largely due to news leakage and insider trading (Meulbroek, 1992, Shivakumar, 2000, and Schwert, 1996) rather than earnings management.

2.2 Takeover Rumours

My study also relates to the literature on takeover rumours. Prior studies pay attention to the power and accuracy of rumours in merger and acquisition settings. Ahern and Sosyura (2014) view firms as active players which can use media coverage to impact their stock price. They state that in the time around corporate events (such as mergers and acquisitions, stock issues, repurchases, and proxy contests) press can be used by firms to manipulate their stock price. Analyzing a sample of 507 mergers found within both the Thomson Reuters Securities Data Company (SDC) and Factiva databases, they find that target firms with increased media coverage have increased share price during the negotiation period, and negotiation periods tend to have increased media coverage as well. These findings are consistent with the studies of Huberman and Regev (2001) and Tetlock (2007), which confirm that firms strategically use the press to boost their stock price, with large run-ups in stock price attributed to investors' attention and overreaction.

Jarrell and Poulsen (1989) assert that target firms experience dramatic increases in stock price before a formal bid announcement date. They examine 172 cash tender offers from 1981 to 1985 and find that both unexpected premiums and run-ups in target share price can be largely explained by the presence of rumours about an impending bid in the media. Pound and Zeckhauser (1990) examine the effect of takeover rumours on stock price using a sample of 42 rumours published on the "Heard on the Street" (HOTS) column of the *Wall Street Journal* between 1983 and 1985. They find target firm stock price run-ups over 20 trading days before the materialization of rumours. They also find no abnormal profits from buying the shares of firms mentioned in the column, even though these stocks show a significant positive excess return in the 20 trading days before the publishing of a rumour.

In addition to the HOTS column, Zivney, Bertin and Torabzadeh (1996) also use the “Abreast of the Market” (AOTM) column, which appears on the same page from *Wall Street Journal* as the HOTS column. They examine a sample of 871 takeover rumours between 1985 and 1988 and show that the 302 initial rumours from the AOTM column have higher prediction power, in terms of rumour accuracy, and that the rumoured firms experience significant run-ups before the rumour date. By analysing the post-rumour publication return and investor overreaction, they posit optimized holding and buying strategies.

Ahern and Sosyura (2015) construct a sample of 501 initial merger rumours from the Factiva database between 2000 and 2011. They examine the prediction power of corporate takeover rumours and assert that the media has an incentive to publish sensational news, with the journalist’s experience, specialized education, and industry expertise influencing the accuracy of rumours. Consistent with extant findings, Clarkson, Joyce and Tutticci (2006) show that rumours are always associated with abnormal returns. They analyze 189 takeover rumour postings in the Hotcopper Internet Discussion Site from May 1999 to March 2000 and find abnormal returns and trading volumes the day before and the day of the rumour publishing.

3. Hypotheses

Many studies have examined the connection between acquirer earnings management and takeover rumours. There is, however a relative dearth of studies focusing on the relationship of target firm earnings management. As previously stated, Erickson and Wang (1999) find positive but insignificant pre-merger unexplained accruals for target firms surrounding the takeover announcement, and they attribute these insignificant results to the inflexibility of targets and the timings of transactions; i.e., by the time the takeover announcement is evident, target firms rarely

have enough time to engage in undetected earnings manipulation, even if they desire to do so. As we know that firms actively use media coverage around corporate events to manipulate their stock price (Ahern and Sosyura, 2015; Cook, Kieschnick, and Ness, 2006; and Chen, 2003), it seems reasonable to examine whether target firms manipulate their earnings around events other than takeover announcements. I specifically examine target firm earnings management surrounding the initial publicized rumours of their acquisition, as this event provides target firm managers with a reason for manipulating earnings (a potential takeover premium), yet may afford them enough time to implement such manipulation before the acquirer has determined the offer amount.

I thus investigate two major research questions in order to determine the extent, if any, of earnings management for firms rumored to be takeover targets: First, I hypothesize that in general, rumored target firms manipulate their accounting earnings upwards close to the rumour release date, in an attempt to inflate the transaction price of the acquisition. Second, I hypothesize that rumours which are easier for target firm managers to anticipate provide stronger evidence of earnings management. Such rumour types include those are initiated by the target firm itself, those which indicate a financial advisor has been hired, and those which indicate that the firm has been in financial distress for some time and rumours concerning retaining investment bank service. In these circumstances, the timing of the takeover rumour is more certain, permitting strategic implementation of earnings management in the period prior. In addition, managers of financially distressed firms have clear incentives to manipulate their earnings and are likely to understand their vulnerability to an impending takeover attempt (Nagar and Sen, 2016). I rephrase my hypotheses as below:

Hypothesis 1: Rumoured target firms manipulate their accounting earnings upwards prior to the rumour release date, in an attempt to inflate the transaction price of the acquisition.

Hypothesis 2: Rumours which are easier for target firm managers to anticipate provide stronger evidence of prior earnings management.

4. Data and Sample

I use the rumour sample constructed by Betton, Davis, and Walker (2017), which identified 2,074 initial takeover rumours of target firms in the period between January 2002 and December 2011. They constructed this sample by searching public U.S. firms listed in the Centre for Research in Security Price (CRSP) database and matching them with rumours taken from S&P Takeover Talk, S&P Capital IQ, Zephyr, Factiva and Pro-Quest. These sources include thousands of newspapers, news wires, and business journals during the period from 2002 to 2011. They ultimately identified 2,074 rumours, which have a 180-day clean window¹ preceding the rumour date, and categorize each according to one or more of 21 rumour types as presented in Appendices Table 1. Since previous studies question the accuracy of the Thomson Reuters SDC Platinum database (Faccio and Masulis 2005), they also provide verification and correction for the sample data by manually searching rumoured target firm announcement dates on both Factiva and Google.

In the rumour sample, there are 1,152 unique target firms subject to rumours during the period from 2002 to 2011. After eliminating firms without complete accounting data as required to compute earnings management, there remain 1,831 identified initial rumours representing 1,079 uniquely rumoured target firms.

In Table 1, I show the distribution of sample firms by Fama – French 48 industry codes and by rumour year. Business service has the most of initial rumour among the 48 industries, with 16.6%

¹ Betton, Davis, and Walker (2017) search back to make sure similar rumours do not exist for those rumoured target firm within the last 180 days, recording only the initial rumour.

of the total rumours. Capital-intensive industries make up much of the sample, with Pharmaceutical Product, retail industry, and petroleum and natural gas products accounting for 11.41%, 8.03%, and 7.97% of the sample respectively.

As displayed in panel B of Table 1, the number of merger and acquisition related rumours increases over time. This is consistent with Sosyura (2014), who finds that firms are actively engaging in media coverage. In Panel B, I also present SDC merger and acquisitions deals during sample period. As observed in Panel B, the number of M&A deals recorded in Thomson Reuters SDC Platinum database increases over time but there's fluctuations during financial crisis (2008-2010).

[Insert Table 1]

In Table 2, I present the summary statistics for all the 21 rumour categories, grouped by event year, in my sample. Rumour characteristics are not mutually exclusive, which means one rumour can have multiple characteristics. I divide the ten sample years into three periods: Pre-financial crisis (2002-2007), the financial crisis (2008-2009), and post-crisis (2010-2011). Overall, the number of scoop rumours increases year by year, with the sum of the last two years six times that of the previous years. This suggests that even during the financial crisis, firms rarely decreased their manipulation of media coverage.

[Insert Table 2]

In Table 3, I present additional summary statistics of fundamental information for my sample of target firms, including rumoured target firm sales, total assets, earnings and market value. The rumoured target firm in our sample, with an average (median) total assets of \$6,433.39 (\$ 1985.80) and average (median) market value of \$5,891 (\$ 2,148) million, are relatively small. The quarterly earnings before interest and tax (EBIT) for rumoured target firms range from -\$6,077 to \$10,496, which means some firms are profitable while others are experiencing losses. Since the sample is

heavily concentrated in capital-intensive industries, I also present the quarterly earnings before interest, tax, depreciation, and amortization (EBITDA) to have a more precise understanding of the corporate characteristics of rumoured target firms. Consistent with what I have observed using EBIT, the profitability changes across firms.

[Insert Table 3]

There are 163 (representing 9% of the total) rumours whose publication date is after the earnings release date² in the same quarter, while 91% of rumours are released prior to the quarterly earnings announcement date. Since the majority of rumours are released before quarterly earnings in the same quarter, and these rumours might have an influence on analyst earnings forecast, it is reasonable to estimate accounting accruals surrounding rumour publication date. In addition, Erickson and Wang (1999) suggest firms might continuously engage in earnings management activities until a merger agreement is reached. Thereby, periods surround rumour date, both preceding and following, are likely to be subject to earnings management activities. As shown in Figure 1, for all rumoured target firms, the quarter with rumours following the earnings release is defined as quarter 0 (Q_0). The first quarter prior to quarter 0 is defined as quarter -1 (Q_{-1}), two quarters prior to quarter 0 is defined as quarter -2 (Q_{-2}). The first quarter after quarter 0 is considered as quarter 1 (Q_1) and the second quarter as quarter 2 (Q_2), etc.

[Insert Figure 1]

In Appendices Table 1, I present definitions of key variables, such as essential rumour categories, discretionary accruals and control variables utilized in multivariate analysis. Consistent with previous studies, I include return on assets (ROA), the leverage ratio, and the Altman's Z-score to

² Quarterly earnings announcement date refers to the first date that quarterly earnings are reported. This data is available on *Compustat* as data date.

my multivariate analysis as control for firms' characteristics (Kothari, Leone, and Wasley, 2005, Becker et al., 1998, Strebulaev and Yang, 2013, and Howe and Houston, 2015).

5. Methodology

The first step in determining whether firms engage in earnings management activities is to calculate accounting accruals. In this paper, I follow previous studies and use discretionary accruals as a proxy for earnings management. (Healy, 1985).

Discretionary accruals are defined as the difference between total accruals and estimated accruals, which also refers to the residuals from the earnings management detective model. I measure total accruals the same way as Erickson and Wang (1999)³, who define it as the difference between net income and operating cash flows⁴. The expected accruals are estimated by using the Jones Model (Jones, 1991), which is utilized to control for the effects of changes in a firm's economic circumstances on nondiscretionary accruals. The conventional linear discretionary accruals model estimated by Jones (1991) has been widely used in accounting literature to estimate abnormal accruals (Dechow 1994; Becker et al, 1998; Erickson and Wang, 1999). The Jones model controls for change in firm's revenues and gross property, plant and equipment in order to eliminate expectable accrual-related changes. Working capital accruals are expected to increase with revenues, while depreciation are expected to have a positive relationship with property, plant and

³ According to Erickson and Wang, the calculation is also the same as Deangelo (1994) and close to Healy (1985).

⁴ All the accounting fundamental data are from quarterly *Compustat* database. Net income is defined as quarterly *Compustat* data item 69. Followed Erickson and Wang (1999), operating cash flow is estimated by working capital from operation minus working capital accruals. Working capital from operations is the sum of income before extraordinary items (item 76), depreciation and amortization (item 77), extraordinary items and discounted operations (item 78), deferred taxes (item 79), equity in net loss (earnings) (item 80), sales of property, plant and equipment, gain or loss on sale of investment (item 102), and other funds from operation (item 76). Working capital accruals are calculated as the sum of changes in accounting payable (item 46), income tax payable (item 47), and other current liability (item 48), plus the sum of change in inventory (item 38), account receivable (item 37), and other current asset (item 39). For any item who calculated as a cumulative basis is adjusted to reflect quarterly value.

equipment. All variables from Jones model are scaled by the beginning of quarter book value of total assets to control for the influence of firm size. Therefore, consistent with the previous studies, I use the Jones Model to estimate the value of discretionary accruals. The discretionary accruals are measured as the residuals from the following model:

$$Accr_{i,t}/Assets_{i,t} = \alpha_0 + \alpha_1 \left(\frac{1}{Assets_{i,t}} \right) + \alpha_2 \Delta Rev_{i,t} + \alpha_3 PPE_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $Accr_{i,t}$ is the total accruals for firm i in quarter t . $\Delta Rev_{i,t}$ is the quarterly change in revenues ($\Delta sale_t$) scaled by total assets ($at_{i,t}$) for firm i in quarter t , and $PPE_{i,t}$ is property, plant, and equipment for firm i in quarter t ($ppegt_t$) scaled by total assets ($at_{i,t}$). $\varepsilon_{i,t}$ is abnormal accruals for firm i at time t . The abnormal accrual is considered to be lower when differences between actual accruals and the expected accruals are higher.

I show the detailed linear regression for the Jones Model in Table 4. The estimation uses 1,831 initial rumours and 13,991 firm quarters over the period 2002 to 2011. The F-statistic for the model is 241.59 (<.0001). All the control variables from the Jones Model are statistically significant at the 5% level. Consistent with prior studies, I find a positive relationship between total accruals and change in firms' revenue and a negative correlation between total accruals and gross property, plant and equipment.

[Insert Table 4]

In Table 5, I present the statistical description of rumoured target firm quarterly earnings management around rumour release quarters. Figure 2 uses the residuals from the Jones Model in Eq. (1) as the mean and median of quarterly earnings management of rumoured firms and plots them surround the rumour release date. Quarter 0 is the quarter in which firms immediately release

their quarterly earnings precede rumour publication. Quarter $-t$ is the t th quarter preceding quarter 0, and vice versa.

The results in Figure 2 show that the level of median unexplained earnings is generally higher than the level of mean unexplained earnings and median unexplained earning for each quarter is above zero. This indicates that there might exist some negative outliers among unexplained earnings to drag the mean unexplained earnings down. A similar conclusion can be drawn from Table 5, the absolute value of quarterly minimum residuals is higher than that of maximum residuals, as well. Despite there are several quarters that the mean unexplained earnings are smaller than 0 (quarter - 2, 0, and 4), a lower minimum residual among peers always can be observed.

The large scale of negative outliers and significant discrepancy between mean and median unexplained earnings can be attributed to firms' consecutive financial losses, financial distress, large depreciation or amortization finance activities, or even an error in the sample. In order to avoid drawing conclusions based on outliers and errors in the data, I delete the top and bottom one percentile of unexplained earnings.

[Insert Table 5]

[Insert Figure 2]

6. Empirical Results

6.1 All Rumour Categories

To investigate whether the rumoured target firms in my sample dataset participate in earnings management activities around rumour publications I first analyze the unexpected earnings trends for eight quarters surrounding rumour publication date. I conduct a multivariate test to evaluate the time profile of accruals contributes to rumoured target firms' earnings management.

Unexpected earnings are proxied by discretionary accruals, previously defined as the residuals estimated from the Jones Model shown in Eq. (1). To control for the variations caused by time changes I add year fixed effects to the regression shown below.

Kothari, Leone, and Wasley (2005) argue that accruals are correlated with performance since firms who experienced unusual performance systematically have nonzero accruals. Therefore, I introduce return on assets (ROA) into my regression model to control for firm performance. I also control for leverage since higher levels of leverage may be associated with debt covenant violation and discretionary accrual management (Becker et al. 1998; Defond and Park, 1997). In addition, Howe and Houston (2015) find that firms in financial distress engage in greater earnings management than non-distressed firms do. Z-score, an accounting ratio based on the bankruptcy model of Altman (1968, 2000), is utilized to assess the level of financial distress for all of the rumoured target firms in my sample. My focus in this subsection is to examine whether rumoured target firms engage in earnings manipulation activities and to find out the time profile of those activities. I presents Pearson correlation matrix of control variables in table 6 to estimate the strength of the correlation among the three variables. Normally, there raises collinearity concerns only when the correlation coefficient is over 0.5 or less than -0.5. Thereby, I keep all three control variables in my following regressions.

[Insert Table 6]

In order to examine how the pre-rumour and post-rumour quarters affect firms' earnings management activities, I first integrated the quarters preceding to the rumour as H_1 , which equals to one for pre- rumour quarters (Q_{-2} to Q_0) and zero otherwise, the quarters following to rumour quarter as D_1 , which set equal to one for post- rumour quarters (Q_1 to Q_2) and zero otherwise. My initial regression model is:

$$UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 H_1 + \beta_5 D_1 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t} \quad (2)$$

Where $UAcc_{i,t}$ is unexplained earnings for firm i and in quarter t . $ROA_{i,t}$ is return on assets for firm i in quarter t ; $Lev_{i,t}$ is the leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . Y_y is a dummy variable to control for year fixed effect which equals one for year y and zero otherwise. As I address in the previous section, to mitigate the effect of errors and outliers in the data, I delete the top and bottom 1% of unexpected earnings in my sample dataset.

In addition, to run the regression in an integration level, I also analyze unexpected accruals for each quarter surrounding the rumour publication date to capture the accurate time profile of target rumour firms' earnings management activities. My second multivariate analysis model is showed as below:

$$UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \sum_{t=-2}^2 \beta_t Q_t + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t} \quad (3)$$

where Quarter $-t$ is the t th quarter preceding quarter 0 and Quarter t is the t th quarter preceding quarter 0. Quarter 0 is the quarter in which firms immediately release their quarterly earnings preceding rumour publication.

In Table 7, I present parameter estimates for the association between rumoured target firms' unexplained earnings and pre and post rumour quarters from 2002 to 2011. In all the three models, coefficients on the control variables (return on assets, leverage ratio, and Z score) are significant at the 1% level. The coefficient for H_1 is positive and significant at the 10% level, which indicates that rumoured target firms significantly manipulate their earnings upward in the quarters preceding the date in which the rumour was first published, while the coefficient for D_1 , the post rumour quarters, is negative and insignificant. This seems to imply that companies subject to takeover

rumours are likely to inflate their earnings in the pre-rumour period, in an attempt to increase any forthcoming takeover offers.

Similarly, the results from quarterly basis (Table 7) are consistent with previous findings. I observe a significant (at the 10% level) and positive coefficient for Q_{-1} . This positive significant coefficient implies that in general, the rumoured target firms are likely to increase their earnings two quarters prior to the initial rumour announcement. The coefficient for Q_0 is positive but not significant. Earnings is one of the key variables for analysts from an investment bank or investment institutions to conduct firm valuation and due diligence. Gong et al (2008) state that managers may manipulate market expectations through gradual manipulation of reported earnings. Therefore earnings management activities might start early in the quarter. For the remaining quarters, the coefficients are mostly positive but insignificant. Overall, the results are consistent with Erickson and Wang (1999) study which find acquirers manipulate their earnings upward prior to corporate merger agreement announcement date in terms of stock swap merger. The results are also consistent with Teoh, Welch, and Wong (1998), Shivakumar (2000) and Gong, Louis and Sun (2008), who find firms significantly manage their earnings prior to major public corporate events such as initial public offerings, secondary public offerings, and open market repurchases.

Insert Table 7

6.2 Rumour Types

It is interesting to estimate if the subgroup of takeover rumours with specific characteristic exhibit significantly influence on earnings management activities. In the initial rumour sample, Betton, Davis, and Walker (2017) cover a wide range of rumour sources, finding that the market reacts differently to each of those sources of information. Firms and management who are mentioned in or engage in those rumours would also differ in their reactions to rumours. Erickson and Wang

(1999) find a positive but insignificant relationship between target firms' unexplained earnings and pre-merger quarters. They attribute this insignificant result to timing considerations. Acquirers can identify and plan out the time of acquisition, whereas the target firms are in a relatively passive position. In general, merger and acquisition deals are usually announced and agreed to within a quarter, and in most of the cases, target firms are only aware of the potential merger and acquisition opportunity when the acquirers reach out and initiate the negotiations. Therefore, in most of the transactions, target firms do not have sufficient time to manage their earnings. The potential determinants should ensure target firms' management flexibility or imply a forthcoming deal for the management team, despite the deal not yet coming publicly.

When target firms initiate the rumours, however, they gain the ability to identify their acquirers and time the deals. In this case, the rumoured target firm has sufficient time to schedule and engage in earnings management activities. In addition, prior studies find that merger rumours associated with target-initiated deals might lend more credibility to an impending deal and be used by media as evidence to support rumours. Management teams of firms who release the potential deal rumours thus have strong incentives to manipulate their earnings upward in pre-rumour quarters. Similarly, if the rumour mentioned that the target firm hired an advisor or retained investment banking service, it might imply they are more prepared than target firms with shortly noticed negotiation, and have enough time to engage in earnings management activities. Besides, rumour related to hiring and retaining advisor service might indicate a forthcoming deal, despite a rumour not yet existing. Thereby, the management is incentivized to effectively protect the interests of shareholders and the firm.

Teoh, Welch, and Wong (1998) find managers who underperform (relative to market expectations) in consecutive quarters are likely to be fired. Besides, for most replaced managers from financially

distressed firms, the major reason is failing to meet analyst expectations (Negar and Sen, 2016). In addition, for managers of firms rumoured to be in financial distress, they are more likely to manage their earnings in order to avoid reporting the volatility of the earnings and losses than other firms (Howe and Houston 2015). Furthermore, the hubris hypothesis postulates that some managers believe that they can correctly identify the undervalued firms (Roll, 1986). Firms who are rumoured in financial distress are likely to be spotted by these managers and involve in a potential takeover deal. Thereby, rumoured target firms are likely to manipulate their earnings more in order to have stronger negotiating positions with potential bidders and protect the interests of their shareholders.

To identify significant determinants of the earnings management, I run a cross-sectional regression to test the relationship between earnings management and various potential determinants (takeover rumours), including rumours initiated by target firms, rumours concerning the hiring of advisors, and rumours concerning financial distress. I then estimate the time profile of the firms' earnings management activities to capture how firms transit certain incentive to actions. Consistent with the research model I build in section 5.1, I simply add the individual rumour category dummy variable (and the appropriate control variables) into the regression model. I employ the following model:

$$UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Target_ini_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t} \quad (4)$$

$$UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Distress_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t} \quad (5)$$

$$UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Advisor_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t} \quad (6)$$

$$UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 RumorCombined_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t} \quad (7)$$

where $UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for

firm i in quarter t ; $Lev_{i,t}$ is the leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . Y_y is a dummy variable controlling for year fixed effect. It equals one for year y and zero otherwise. $Target_ini_i$ is a dummy variable equal to one when firm i initiated the buyout rumour and zero otherwise. $Distress_i$ is a dummy variable set to one when firm i is rumoured to be experiencing financial difficulties or financial distress and zero otherwise. $Advisor_i$ is a rumour dummy equals to one when firm i retained the services of an investment bank or advisor. $RumorCombined_i$ is an integrated dummy, equals to one when $Target_ini_i$, $Distress_i$ or $Advisor_i$ is one and zero otherwise. To control for the downside effect caused by outliers and errors in the data, I remove the top and bottom 1% of unexplained earnings, return on assets, and leverage ratios from the sample.

Table 8 reports the results of the regression of different rumour categories and pre and post rumour quarters on unexplained earnings. Consistent with the results from subsection 5.1, the coefficients of control variables (return on assets, leverage ratio and Z score) are statistically significant at the 1% level. I observe significant negative coefficients for the leverage ratio and Z score, both of which are used to control for the firm's financial condition. These are included because firms who have high leverage ratios or are experiencing financial difficulties are expected to write off assets more frequently and exhibit larger negative discretionary accruals. For certain types of rumours, such as target-initiated rumours, financial distress rumours, and advisor being hired rumours, the rumoured target firms tend to inflate their earnings upward in pre-rumour quarters. Table 8 also reports significant positive coefficients for the target-initiated, financial distress, and advisor hired dummies at 1%, 5%, and 1% significant levels respectively. The target-initiated dummy has the largest scale; rumours initiated by the target lead to a 1.7% increase in unexplained earnings. Rumours involving financial distress are not economically significant as they lead to only a 0.7%

increase in unexplained earnings. Therefore, these three types of rumour might be the indicators that show the rumoured target firms would engage in earnings management activities and manipulate their earnings upward in pre-rumour quarters. The strong results for target-initiated and advisor hired dummies suggest that purposeful actions on the part of the target (e.g. starting a rumour or hiring advisors) are more closely tied to earnings management than the target's financial position (e.g. financially distressed). Furthermore, I also combine these specific rumours together in Eq. (7), as an integrated dummy, $RumorCombined_i$, that is positive and significant at the 1% level. These three rumours are thus significantly related to earnings management independently of the other rumour types.

[Insert Table 8]

In addition, I also add interaction terms to test whether firms with specific rumours tend to manipulate their earnings preceding the rumour publication quarter. $Target_ini_i * H_1$ is the product of $Target_ini_i$ and H_1 ; $Target_ini_i * Q_{-1}$ is the product of $Target_ini_i$ and Q_{-1} ; $Distress_i * H_1$ is the product of $Finance_D_i$ and H_1 ; $Distress_i * Q_{-1}$ is the product of $Distress_i$ and Q_{-1} ; $Advisor_i * H_1$ is the product of $Advisor_i$ and H_1 ; $Advisor_i * Q_{-1}$ is the product of $Advisor_i$ and Q_{-1} .

For models A to F, shown in Table 9, the product of rumour categories and time indicator are separately added into the models. Because all the rumour indicators and time indicators are dummy variables, auto-correlation may be a problem if I keep all the variables in the regression. Therefore, I only keep the product since my main focus is to examine whether specific rumour firms manipulate their earnings upward at pre-rumour quarters. Table 9 reports the results of parameter estimation from ordinary least regression. The coefficients for most of the interaction terms are significant (1%) and positive, which indicates that firms who start the rumour, are rumoured to be

in financial distress, and are rumoured to be hiring advisor are likely to inflate their earning in pre-rumour periods, which is consistent with my previous finding. for the product of $Distress_i$ and H_1 , the p-value is still relatively small (0.1157), but not significant. In conclusion, firms which are the subject of certain categories of rumours are likely to manage their earnings upward in pre-rumour quarters.

[Insert Table 9]

6.3 Matched Sample

In order to ensure my results are not driven by outliers, I provide additional non-parametric analyses of unexplained earnings through a matched sample of control firms. These firms are listed on *Compustat* and are matched by three-digit SIC. I also make sure the sizes of matched firms are similar to those of the rumoured firms for 30% of the matched sample. For the rest of the sample, I match by book-to-market ratio.

Since the difference in unexplained earnings between the two samples is normally distributed (Figure 3), I conduct a Student's t-test to examine whether the unexplained earnings from my rumour sample are significantly different from that of the matched sample. At the same time, I also investigate the scale of unexplained earnings from both samples to test whether the unexplained earnings of rumoured target firms have a larger scale than match sample firms.

[Insert Figure 3]

Table 10 presents results of mean unexplained earnings difference test under multiple settings. In Panel A, I show the t statistic of the mean difference of unexplained earnings from both samples in the quarters prior to quarter 0. The mean difference is positive and significant at the 1% level (with a p-value of 0.004). This indicates that, in general, rumoured target firms have greater unexplained earnings in pre-rumour quarters than matched sample firms. In Panel B, I exclude

firms who have initiated rumours, are rumoured to be in financial distress and rumoured to be hiring merger and acquisition advisors. The unexplained earnings for rumoured target firms are significantly greater than that of matched firms. Overall, the wide discrepancy of the mean difference on unexplained earnings points out the potential influence of heightened media and investor awareness.

In addition, I also examine whether the specific three rumour types excluded from Panel B have a stronger impact than remaining rumours. I conduct the Kolmogorov-Smirnov test to check the normality of the rumour sample. Since the earnings management is not normally distributed in the sample period, a Wilcoxon Rank Sum test is used to test median differences between the two groups. Panel C reports the results of two-tailed Wilcoxon Rank Sum test. The median difference between $RumorCombined_{i,t}$ firms and other rumour firms are significantly different from zero at the 1% level, and the median difference is positive. In conclusion, the three rumour types (target initiated rumours, targets in distress rumours, and rumours mentioning the hiring of a financial advisor) have a stronger impact on earnings management than other rumours combined. This provides evidence that in cases in which rumours are more easily anticipated by the target firms, earnings management is more severe, in accordance with my second hypothesis.

I also build a sample which comprises rumoured firms and a one-to-one matched sample. A dummy variable, $RumorFirm_i$, is created to identify rumour firms. I compared the earnings management for rumour firms with that for matched firms in the same time period by regressing $RumorFirm_i$ on firms' unexplained earnings while controlling for the return on assets, leverage, and the Z-score. As the results show in Panel D, compared with the matched firm, rumoured target firms have an increased 0.2% in earnings management, significant at the 10% level.

[Insert Table 10]

7. Robustness Test

7.1 Alternative Measure of Earnings Management

The previous analysis was conducted using the Jones Model to estimate earnings management. As several studies have mentioned the tendency of the Jones Model to measure discretionary accruals as an error term when discretion is exercised over revenue recognition, I perform a robustness check. Specifically, I use the Modified Jones Model in coordination with the performance-matched approach as an alternative to estimate the discretionary accruals for rumoured target firms.

Consistent with my previous method, I use abnormal accruals as a proxy for earnings management. Following Gong, Louis and Sun (2008) and Louis, Robinson, and Sbaraglia (2008), I estimate abnormal accruals using the residual of the Modified Jones model shown below:

$$TA_{i,t} = \alpha_1 Assets_{i,t} + \alpha_2 \Delta Sale_{i,t} + \alpha_3 PPE_{i,t} + \alpha_4 LTA_{i,t} + \varepsilon_{i,t} \quad (8)$$

where $TA_{i,t}$ ⁵ is total accruals for firm i in quarter t . $Assets_{i,t}$ is the total asset at the beginning quarter for firm i in quarter t . $\Delta Sale_{i,t}$ is the quarterly change in sales for firm i in quarter t . $PPE_{i,t}$ is the plant property and equipment at the beginning quarter for firm i in quarter t . $LTA_{i,t}$ is the lag of total accruals for firm i in quarter t . $\varepsilon_{i,t}$ is the residual from the regression. Gong, Louis and Sun (2008) scaled the model by the total assets at the beginning quarter. This approach is used in my model and results in a column of ones to estimate the intercept. In order to reduce the effect of

⁵ Since my sample period starts from 2002, when cash flow statements are widely available, I measure total accruals based on changes in cash flows statement data instead of the balance sheet. Specifically, total accruals the change in current assets minus current liability minus change in cash and cash equivalents, minus the change in debt include current liabilities and plus depreciation and amortization expense.

outliers and errors in the data, they delete the top and bottom one percentile of deflated variables. In addition, they estimate the accruals for each two-digit Standard Industrial Classification (SIC) code that has more than 20 observations.

Kothari et al. (2005) find that the performance matching approach using current year return on assets is superior to including an independent variable in a discretionary accruals regression. Therefore, I create five portfolios with at least four firms each by sorting the data into quintiles based on ROA from the same quarter in the previous year. Following Louis (2004), the abnormal accruals for firms are the difference between rumoured target firms' discretionary accruals and the median discretionary accruals from its respective industry performance-matched portfolio.

Following my previous research model, I keep return on assets, leverage ratio, and Z score as my control variables. I also add year fixed effects to control for the variations across the sample period. Table 11 uses an alternative method to present the parameter estimation results for my first hypothesis, which is to examine whether and when rumoured target firms engage in earnings management activities. Most of the control variables are significant, with one exception: the Z-score, which is used to control for firms' levels of financial distress. As in previous tests, the quarters prior to the rumour date are positively significant. The integrated quarters dummy and one quarter before rumour announcement date (Q_{-1}) variables are significant at the 10% level. The results support my previous finding: rumoured target firms tend to inflate their earnings in the pre-rumour period and do so within two quarters before the date in which the rumour is published. In addition, I test how certain types of rumours, namely target-initiated rumours financial distress rumours, and advisor hired rumours, affect firms' earnings management activities through the alternative methodology. Table 12 shows the results of whether and when rumours target firms manipulate their earnings upwards. Consistent with my previous findings, firms initiating the

rumours or rumoured to be in financial distress have a significant and positive relationship with firms' unexplained earnings at the 1% and 10% level, respectively. To this extent, when firms are rumoured to be in financial distress, are themselves initiating rumours with potential bidders, or retaining investment banking services, targets are likely to engage in earnings management activities. I also find a positive and significant relationship between firms' earnings management levels and pre-merger quarters at both an integrated and quarterly level. Consistent with previous findings, I find significant (10%) and positive coefficients for H_1 and Q_{-1} .

[Insert Table 11]

[Insert Table 12]

7.1 Endogeneity

A possible remaining concern relates to endogeneity, in that rumor publications may be a result of corporate earnings management activities (rather than the hypothesized causality of earnings management occurring due to the anticipation of takeover bids). To mitigate this concern, I remove from the sample instances in which this effect is likely to be strongest; namely, those firms experiencing significant share price movements on the public release of earnings which have been significantly managed upward. Specifically, I calculate cumulative abnormal returns for a 7 day period following the earnings release, and remove those 127 firms for which such returns are significant. The remaining 1,704 firms are used as a subsample to repeat the prior analysis of Tables 7 and 8, with results presented in Tables 13 and 14.

Results are robust: potential takeover targets manipulate their earnings upward in the pre-rumour periods and when rumours are easily anticipated, such as target initiated rumours, financial distress rumours and retaining advisory service rumours. The only qualitative difference in results is in

Table 13 Model B, with significant earnings management activity occurring one quarter prior than before, in Q-2.

[Insert Table 13]

[Insert Table 14]

Overall, these tests confirm our general results, which are robust to the choice of the earnings management estimation method and the exclusion of earning quarters with significant abnormal returns. Results indicate that rumoured target firms tend to manage their earnings upwards in pre-rumour quarters, with stronger results when such rumours are more easily anticipated by the sample firms.

8. Conclusion

This study investigates whether firms manage earnings in proximity to the initial published release of rumours which implicate the firm as a takeover target. My first hypothesis is that firms manage their earnings upwards, while my second hypothesis is that rumours which are easier for target firm managers to anticipate provide stronger evidence of earnings management. Following Erickson and Wang (1999), I apply the Jones Model (Jones, 1991) to a unique sample of 1,831 takeover rumours from 2002 to 2011 to estimate firms' total accruals, and use the difference between total accruals and estimated accruals to proxy for earnings management.

I find strong evidence that firms publicized as potential takeover targets manipulate their earnings upward in the pre-rumour periods. The results are robust to both a matched sample as well as to an alternative method of calculating discretionary accruals. While prior studies do not find evidence of earnings management within target firms prior to takeover announcements, this is likely due to a limited ability to do so once negotiations are underway (Erickson and Wang, 1999).

Our results imply that such activity is occurring up to two quarters prior to the initial publication of a takeover rumour, which itself occurs on average 181 days prior to any upcoming takeover announcement. The results are particularly strong when target firms are more likely to be aware of impending takeover possibilities (i.e., when they themselves create the rumour, are rumoured to be experiencing financial distress or are rumoured to retain the service of an investment bank).

In sum, results are consistent with firms managing earnings upwards well in advance of takeover negotiations and before their opportunity to do so becomes constrained. This effect appears undocumented in the literature.

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Tables and Figures

Table 1

Industry and event-year distribution for a sample of 1831 takeover rumours firms from 2002-2011

Panel A: Sample Distribution by Industry		
Industry	Frequency	Percent
Aircraft	9	0.49%
Apparel	27	1.47%
Automobiles and Transportation	21	1.15%
Beer & Liquor	4	0.22%
Business Services	304	16.60%
Business Supplies	12	0.66%
Chemicals	31	1.69%
Coal	14	0.76%
Communication	110	6.01%
Computers	121	6.61%
Construction	20	1.09%
Construction Mate	20	1.09%
Consumer Goods	28	1.53%
Electrical Equipment	14	0.76%
Electronic Equipment	119	6.50%
Entertainment	52	2.84%
Food Products	41	2.24%
Healthcare	17	0.93%
Machinery	33	1.80%
Measuring	21	1.15%
Medical Equipment	44	2.40%
Non-Metallic	30	1.64%
Personal Services	14	0.76%
Petroleum and Natural Gas	146	7.97%
Pharmaceutical Product	209	11.41%
Precious Metals	12	0.66%
Printing and Publication	8	0.44%
Recreation	8	0.44%
Restaurants, Hotel	29	1.58%
Retail	147	8.03%
Rubber and Plastic	7	0.38%
Steel Works Etc.	56	3.06%
Tobacco Products	9	0.49%
Trading	24	1.31%
Transportation	38	2.08%
Utilities	8	0.44%
Wholesale	24	1.31%
Total	1,831	100%

Panel B: Sample and SDC Deals Distribution by Year			
Year	Initial Rumours	Rumour Percent	SDC Deals
2002	40	2.00%	28,564
2003	68	4.00%	31,278
2004	95	5.00%	34,127
2005	96	5.00%	37,036
2006	161	9.00%	42,997
2007	156	9.00%	49,334
2008	171	9.00%	47,923
2009	324	18.00%	44,056
2010	323	18.00%	46,556
2011	397	22.00%	47,906
Total	1,831	100.00%	409,777

Note: An increasing number of rumours by year may be a result of media coverage limitations in the early years of the sample period.

Table 2

Statistical summary of 21 rumour characteristics from 2002-2011

Rumour Character	2002-2007	2008-2009	2010-2011	Total
Analyst Report	242	139	185	566
Advisor Hired	93	49	57	199
Bidder Denied	12	7	3	22
Bidder Mentioned	324	210	235	769
Block Purchase	30	15	17	62
Financing Source	11	9	10	30
Industry Activity	108	68	62	238
Insider Cited	104	50	84	238
Mgmt Concerns	26	7	11	44
Options Increased	54	130	273	457
PE Fund Involved	101	40	69	210
Synergy Cited	31	21	22	74
Takeover Chatter	54	161	315	530
Target Denied	7	3	1	11
Target Distress	42	21	5	68
Target Initiated	147	78	67	292
Under valued	123	100	112	335
Unusual Activity	13	8	13	34
Informative	232	106	119	457
Accurate	174	78	115	367
Speculative	10	81	232	323
All rumoured firms	616	495	720	1831

Table 3

Summary statistical description for the sample of 1831 initial rumours from 2002-2011

	Mean	Median	Maximum	Minimum	Std Dev
Sales	1,414.38	363.04	85,329.00	0	3,748.82
Assets - Total	6,433.39	1,985.80	286,592.00	13.50	14,951.04
Earnings(EBIT)	148.50	30.40	10,496.00	-6,077.00	529.38
Earnings (EBITDA)	221.68	56.59	12,416.00	-5,424.00	668.92
Market Value	5,890.78	2,147.56	127,983.68	2.01	10,316.25

Note: Sales, total assets, earnings and market value are quarterly data from *Compustat* – Capital IQ for the rumour publication quarter.
All the numbers are in the units of millions.

Table 4

Parameter estimation of Jones Model

$$Accr_{i,t}/Assets_{i,t} = \alpha_0 + \alpha_1 \left(\frac{1}{Assets_{i,t}} \right) + \alpha_2 \Delta Rev_{i,t} + \alpha_3 PPE_{i,t} + \varepsilon_{i,t}$$

$Accr_{i,t}$ is the total accruals for firm i in quarter t . $\Delta Rev_{i,t}$ is the quarterly change in revenues ($\Delta sale_t$) scaled by total assets ($at_{i,t}$) for firm i in quarter t , and $PPE_{i,t}$ is property, plant, and equipment for firm i in quarter t ($ppeg_t$) scaled by total assets ($at_{i,t}$). The $\varepsilon_{i,t}$ is abnormal accruals for firm i at time t . The estimation use sample of 1,831 initial rumoured target firms from 2002-2011.

Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

	Total Accruals
Intercept	-0.012 (<.0001)***
$1/Assets_{i,t}$	-0.640 (<.0001)***
$\Delta Rev_{i,t}$	0.229 (<.0001)***
$PPE_{i,t}$	-0.007 (0.071)*
Adj. R-square	5.15%

Table 5

Descriptive statistics of earnings management around rumour publication date

Quarter 0 is the first quarter with released earning immediately preceding to rumour date. Quarter $-t$ is the t th quarter preceding quarter 0, Quarter t is the t th quarter following quarter 0. N Obs is the number of observations for each quarter. It shows the number of firms with available data. Std. Dev is the standard deviation of quarterly residuals which predicted by Jones Model showed in Eq. (1).

Event Quarter	N Obs	Median	Mean	Std. Dev	Minimum	Maximum
-4	1,821	0.0061	0.0029	0.0928	-1.1636	0.9018
-3	1,833	0.0065	0.0015	0.0848	-1.0513	0.6078
-2	1,847	0.0067	0.0002	0.0907	-1.9004	0.5841
-1	1,831	0.0069	0.0023	0.1202	-2.3538	1.5199
0	1,811	0.0060	-0.0037	0.1764	-5.9647	1.6199
1	1,791	0.0061	-0.0001	0.0957	-1.5901	0.8225
2	1,650	0.0061	0.0029	0.0967	-1.3850	0.9614
3	1,508	0.0065	-0.0002	0.1600	-3.8762	1.9932
4	1,356	0.0058	-0.0008	0.1094	-2.1299	1.0496

Table 6
Control variables correlation matrix

Correlation	Return on Assets	Leverage Ratio	Z Score
Return on Assets	1	-0.073	0.163
Leverage Ratio	-0.073	1	-0.322
Z Score	0.163	-0.322	1

Table 7

Association between rumoured target firms' unexplained earnings and pre and post rumour quarters

$$\text{Model A: } UnexAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 H_1 + \beta_5 D_1 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model B: } UnexAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \sum_{t=-2}^2 \beta_t Q_t + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model C: } UnexAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Q_{-1} + \beta_5 Q_0 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . H_1 equals to one for pre-rumour quarter and zero otherwise. D_1 sets equal to one for post-rumour quarters and zero otherwise. Quarter 0 is the quarter which firms immediately release their quarterly earnings before rumour publication. Quarter $-t$ is the t th quarter preceding quarter 0, Quarter t is the t th quarter following quarter 0. Y_y is a dummy variable to control for year fixed effect. It equals to one for year y and zero otherwise. The estimation use sample of 1,831 takeover rumour from 2002-2011.

Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings		
	Model A	Model B	Model C
Intercept	0.010 (0.001)***	0.010 (0.001)***	0.012 (0.007)***
Return on Assets	0.234 (<.0001)***	0.234 (<.0001)***	0.234 (<.0001)***
Leverage Ratio	-0.006 (0.001)***	-0.006 (0.001)***	-0.006 (<.0001)***
Z Score	-0.017 (0.008)***	-0.017 (0.007)***	-0.017 (0.0073)***
H_1	0.002 (0.0853)*		
D_1	-0.001 (0.300)		
Q_{-2}		0.002 (0.178)	
Q_{-1}		0.003 (0.074)*	0.003 (0.050)**
Q_0		0.001 (0.836)	0.001 (0.800)
Q_1		-0.002 (0.187)	
Q_2		-0.001 (0.816)	
Year Fixed Effect	Yes	Yes	Yes
N.Obs	11,475	11,475	11,475
Adj. R-square	8.11%	8.11%	8.11%

Table 8

Correlation between rumoured target firms' unexplained earnings and rumour type

$$\text{Model A: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Target_ini_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model B: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Distress_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model C: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Advisor_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model D: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 RumorCombined_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . Quarter 0 is the quarter which firms immediately release their quarterly earnings before rumour publication. Quarter $-t$ is the t th quarter preceding quarter 0, Quarter t is the t th quarter following quarter 0. $Target_ini_i$ is a dummy variable equal to one when firm i starts the rumour in terms of buyout and zero otherwise. $Distress_i$ is a dummy variable equal to one when firms i rumoured experiencing financial difficulties or financial distress in the context of merger and acquisitions and zero otherwise. $Advisor_i$ is a rumour dummy equals to one when firm i retained the services of investment bank or advisor. $RumorCombined_i$ is an integrated dummy equal to one when $Target_ini_i$, $Distress_i$ or $Advisor_i$ is one and zero otherwise. The estimation uses a sample of 1,831 takeover rumour from 2002-2011. Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings			
	Model A	Model B	Model C	Model D
Intercept	0.006 (0.049)**	0.010 (0.007)***	0.009 (0.0084)***	0.007 (0.031)**
Return on Assets	0.445 (<.0001)***	0.427 (<.0001)***	0.431 (<.0001)***	0.531 (<.0001)***
Leverage Ratio	-0.011 (<.0001)***	-0.010 (<.0001)***	-0.010 (<.0001)***	-0.016 (<.0001)***
Z Score	-0.031 (<.0001)***	-0.035 (<.0001)***	-0.036 (<.0001)***	-0.043 (<.0001)***
$Target_ini_i$	0.017 (<.0001)***			
$Distress_i$		0.007 (0.013)**		
$Advisor_i$			0.013 (<.0001)***	
$RumorCombined_i$				0.014 (<.0001)***
Year Fixed Effect	Yes	Yes	Yes	Yes
N.Obs	11,475	11,475	11,475	11,475
Adj. R-square	18.96%	18.22%	18.56%	18.88%

Table 9

Correlation between rumoured target firms' unexplained earnings and different rumour type with interaction terms

$$\text{Model A: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_5 D_1 + \beta_6 Target_ini_i * H_1 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model B: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Target_ini_i * Q_{-1} + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model C: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_5 D_1 + \beta_6 Distress_i * H_1 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model D: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Distress_i * Q_{-1} + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model E: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_5 D_1 + \beta_6 Advisor_i * H_1 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model F: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Advisor_i * Q_{-1} + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . $H_{i,t}$ equals to one for pre-rumour quarter and zero otherwise. $D_{i,t}$ set equal to one for post-rumour quarters and zero otherwise. Quarter 0 is the quarter which firms immediately release their quarterly earnings before rumour publication. Quarter $-t$ is the t th quarter preceding quarter 0, Quarter t is the t th quarter following quarter 0. Y_y is a dummy variable to control for year fixed effect. It equals to one for year y and zero otherwise. $Target_ini_i$ is a dummy variable equal to one when firm i starts the rumour in terms of buyout and zero otherwise. $Distress_i$ is a dummy variable set to one when firms i rumoured experiencing financial difficulties or financial distress in the context of merger and acquisitions and zero otherwise. $Target_ini_i * H_1$ is the product of $Target_ini_i$ and H_1 ; $Target_ini_i * Q_{-1}$ is the product of $Target_ini_i$ and Q_{-1} ; $Distress_i * H_1$ is the product of $Distress_i$ and H_1 ; $Distress_i * Q_{-1}$ is the product of $Distress_i$ and Q_{-1} . For Eq. (4) to Eq. (7), I utilize the product of $Target_ini_i * H_1$, $Target_ini_i * Q_{-1}$, $Distress_i * H_1$ and $Distress_i * Q_{-1}$ to replace $Target_ini_i$, $Distress_i$, H_1 , and Q_{-1} in separate level. The estimation uses a sample of 11,831 takeover rumour from 2002-2011.

Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings					
	Model A	Model B	Model C	Model D	Model E	Model F
Intercept	0.008 (0.024)**	0.009 (0.012)**	0.011 (0.005)***	0.010 (0.006)***	0.011 (0.002)***	0.011 (0.001)***
Return on Assets	0.432 (<.0001)***	0.429 (<.0001)***	0.426 (<.0001)***	0.426 (<.0001)***	0.426 (<.0001)***	0.424 (<.0001)***
Leverage Ratio	-0.010 (<.0001)***	-0.010 (<.0001)***	-0.010 (<.0001)***	-0.010 (<.0001)***	-0.011 (<.0001)***	-0.011 (<.0001)***
Z Score	-0.036 (<.0001)***	-0.036 (<.0001)***	-0.036 (<.0001)***	-0.036 (<.0001)***	-0.038 (<.0001)***	-0.0389 (<.0001)***
D_1	0.002 (0.209)		0.001 (0.607)		0.001 (0.400)	
Q_{-2}		0.002 (0.259)		0.001 (0.445)		0.002 (0.301)
Q_0		-0.000		-0.000		0.000

		(0.891)		(0.614)		(0.790)
Q_1		0.000		-0.000		0.000
		(0.829)		(0.893)		(0.994)
Q_2		0.002		0.002		0.002
		(0.179)		(0.313)		(0.273)
$Target_ini_i * H_1$	0.0201					
	($<.0001$)***					
$Target_ini_i * Q_{-1}$		0.020				
		($<.0001$)***				
$Distress_i * H_1$			0.008			
			(0.116)			
$Distress_i * Q_{-1}$				0.019		
				($<.0001$)***		
$Advisor_i * H_1$					0.013	
					($<.0001$)***	
$Advisor_i * Q_{-1}$						0.011
						(0.010)***
<i>Year Fixed Effect</i>	Yes	Yes	Yes	Yes	Yes	Yes
N.Obs	11,475	11,475	11,475	11,475	11,475	11,475
Adj. R-square	18.56%	18.53%	17.74%	17.75%	13.34%	18.23%

Table 10

Mean and Median Difference Test in Earnings Management for Subgroup

The mean difference is the mean of difference between unexplained earnings, which estimated from Jones Model, from rumoured target firms and unexplained earnings from match sample firms from 2001 to 2011. Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Panel A: Unexplained earnings mean difference between rumour and matched sample			
Mean Difference	Standard Deviation	t Value	P value
0.003	0.096	2.870	0.004***
Panel B: Excluding rumours initiated by targets, indicating distress, and indicating a financial advisor was hired			
Mean Difference	Standard Deviation	t Value	P value
0.002	0.083	2.010	0.036**
Panel C: Median difference in earnings management by rumour type			
Median Difference	Z Value	P value	
0.003	3.644	0.0001***	

Panel D: Parameter Estimation Using Combination of Rumour Sample and Match Sample

$$Model: UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 RumorFirm_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . $RumorFirm_i$ is an dummy variable set equal to one when $Firm_i$ is a rumoured target firm and zero otherwise. The estimation uses a combination of rumour sample and matched sample firms from 2002-2011. Figures in parentheses represent P-values. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings
Intercept	-0.026 (<.0001)***
Return on Assets	0.124 (<.0001)***
Leverage Ratio	0.009 (<.0001)***
Z Score	-0.025 (0.6156)
$RumorFirm_i$	0.002 (0.0664)*
<i>Year Fixed Effect</i>	Yes
N.Obs	17974
Adj. R-square	9.33%

Table 11

Association between rumoured target firms' unexplained earnings and pre and post rumour quarters by using an alternative method to calculate and adjust discretionary accruals

$$\text{Model A: } UnexAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 H_1 + \beta_5 D_1 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model B: } UnexAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \sum_{t=-2}^2 \beta_t Q_t + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . $H_{i,t}$ equals to one for pre-rumour quarter and zero otherwise. $D_{i,t}$ set equal to one for post-rumour quarters and zero otherwise. Quarter 0 is the quarter which firms immediately release their quarterly earnings before rumour publication. Quarter $-t$ is the t th quarter preceding quarter 0, Quarter t is the t th quarter following quarter 0. Y_y is a dummy variable to control for year fixed effect. It equals to one for year y and zero otherwise. The estimation use sample of 1,831 takeover rumour from 2002-2011.

Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings	
	Model A	Model B
Intercept	-0.007 (0.006)***	-0.004 (0.091)*
Return on Assets	0.053 (<.0001)***	0.041 (<.0001)***
Leverage Ratio	0.004 (0.005)***	0.003 (0.007)***
Z Score	0.001 (0.728)	0.002 (0.684)
H_1	0.002 (0.061)*	
D_1	0.001 (0.267)	
Q_{-2}		0.001 (0.222)
Q_{-1}		0.002 (0.09)*
Q_0		-0.004 (0.971)
Q_1		0.001 (0.266)
Q_2		0.002 (0.128)
<i>Year Fixed Effect</i>	Yes	Yes
N.Obs	11,475	11,475
Adj. R-square	2.71%	1.78%

Table 12

Correlation between rumoured target firms' unexplained earnings and different rumour type by using an alternative method to calculate and adjust discretionary accruals

$$\text{Model A: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Target_ini_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model B: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Distress_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model C: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Advisor_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model D: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 RumorCombined_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . Quarter 0 is the quarter which firms immediately release their quarterly earnings before rumour publication. Quarter $-t$ is the t th quarter preceding quarter 0, Quarter t is the t th quarter following quarter 0. $Target_ini_i$ is a dummy variable equal to one when firm i starts the rumour in terms of buyout and zero otherwise. $Distress_i$ is a dummy variable equal to one when firms i rumoured experiencing financial difficulties or financial distress in the context of merger and acquisitions and zero otherwise. $Advisor_i$ is a rumour dummy equals to one when firm i retained the services of investment bank or advisor. $RumorCombined_i$ is an integrated dummy equal to one when $Target_ini_i$, $Distress_i$ or $Advisor_i$ is one and zero otherwise. The estimation uses a sample of 1,831 takeover rumour from 2002-2011. Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings			
	Model A	Model B	Model C	Model D
Intercept	-0.007 (0.002)***	-0.006 (0.0067)***	-0.007 (0.005)***	-0.008 (0.002)**
Return on Assets	0.055 (<.0001)***	0.053 (<.0001)***	0.053 (<.0001)***	0.054 (0.0054)***
Leverage Ratio	0.004 (0.005)***	0.004 (0.006)***	0.004 (0.003)***	0.004 (<.0001)***
Z Score	0.002 (0.567)	0.002 (0.650)	0.002 (0.592)	0.002 (0.563)
$Target_ini_i$	0.003 (0.001)*		0.0028 (0.009)	
$Distress_i$		0.003 (0.082)*		
$Advisor_i$			0.003 (0.009)***	
$RumorCombined_i$				0.009 (0.001)***
Year Fixed Effect	Yes	Yes	Yes	Yes
N.Obs	11,475	11,475	11,475	11,475
Adj. R-square	2.78%	2.71%	2.74%	2.78%

Table 13

Association between rumoured target firms' unexplained earnings and pre and post rumour quarters by excluding significant earnings releasing events

$$\text{Model A: } UnexAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 H_1 + \beta_5 D_1 + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model B: } UnexAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \sum_{t=-2}^2 \beta_t Q_t + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . $H_{i,t}$ equals to one for pre-rumour quarter and zero otherwise. $D_{i,t}$ set equal to one for post-rumour quarters and zero otherwise. Quarter 0 is the quarter which firms immediately release their quarterly earnings before rumour publication. Quarter $-t$ is the t th quarter preceding quarter 0, Quarter t is the t th quarter following quarter 0. Y_y is a dummy variable to control for year fixed effect. It equals to one for year y and zero otherwise. The estimation use sample of 1,704 takeover rumour from 2002-2011.

Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings	
	Model A	Model B
Intercept	0.004 (0.001)***	0.004 (0.001)***
Return on Assets	0.221 (<.0001)***	0.221 (<.0001)***
Leverage Ratio	-0.003 (0.112)	-0.003 (0.110)
Z Score	-0.003 (0.640)	-0.003
H_1	0.002 (0.031)**	
D_1	0.001 (0.4519)	
Q_{-2}		0.003 (0.060)*
Q_{-1}		0.003 (0.075)*
Q_0		0.001 (0.465)
Q_1		0.002 (0.277)
Q_2		0.000 (0.931)
<i>Year Fixed Effect</i>		
N.Obs	10,601	10,601
Adj. R-square	7.74%	7.20%

Table 14

Correlation between rumoured target firms' unexplained earnings and different rumour type by excluding significant earnings releasing events

$$\text{Model A: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Target_ini_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model B: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Distress_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$$\text{Model C: } UAcc_{i,t} = \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Z_{i,t} + \beta_4 Advisor_i + \sum_{y=2}^{10} \gamma_y Y_y + \varepsilon_{i,t}$$

$UnexAcc_{i,t}$ is unexplained earnings for firm i and quarter t . $ROA_{i,t}$ is return on asset for firm i in quarter t ; $Lev_{i,t}$ is leverage ratio for firm i in quarter t ; $Z_{i,t}$ is Z-score for firm i in quarter t . $Target_ini_i$ is a dummy variable equal to one when firm i starts the rumour in terms of buyout and zero otherwise. $Distress_i$ is a dummy variable equal to one when firms i rumoured experiencing financial distress or financial distress in the context of merger and acquisitions and zero otherwise. $Advisor_i$ is a rumour dummy equals to one when firm i retained the services of investment bank or advisor. The estimation uses a sample of 1,704 initial takeover rumour from 2002-2011. Figures in parentheses represent P-value. Significant at 10%, 5% and 1% levels is indicated by *, **, and ***, respectively.

Coefficient	Unexplained Earnings		
	Model A	Model B	Model C
Intercept	0.004 (0.0001)***	0.005 (<.0001)***	0.004 (0.0002)***
Return on Assets	0.231 (<.0001)***	0.222 (<.0001)***	0.227 (<.0001)***
Leverage Ratio	-0.004 (0.054)*	-0.004 (0.09)*	-0.003 (0.1041)
Z Score	-0.009 (0.8969)	-0.028 (0.6781)	-0.002 (0.9712)
$Target_ini_i$	0.009 (<.0001)***		
$Distress_i$		0.006 (0.037)**	
$Advisor_i$			0.011 (<.0001)***
<i>Year Fixed Effect</i>	Yes	Yes	Yes
N.Obs	10601	10601	10601
Adj. R-square	8.07%	7.74%	8.06%

Figure 1

Quarter dummy timeline

For all sample rumoured target firms, the first quarter of earnings release date preceding to rumours date is defined as quarter 0 (Q_0). The first quarter prior to quarter 0 is defined as quarter -1 (Q_{-1}), two quarter prior to quarter 0 is defined as quarter -2 (Q_{-2}). The first quarter after quarter 0 is considered as quarter 1 (Q_1) and the second quarter as quarter 2 (Q_2), etc.

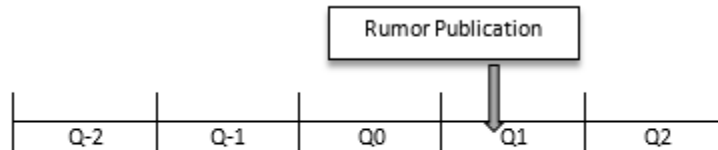


Figure 2

Median and mean earnings management around rumour publication date

Quarter 0 represents the quarter which the reported quarterly earnings is immediately prior to rumour publication. Quarter $-t$ is the t th quarter preceding the rumour releasing quarter, vice versa. Earnings management is computed as the difference between total accruals and discretionary accruals estimated from Jones Model. The green line stands for the mean of earnings management cross quarters, while red line stands for the median of earnings management at the same quarters.

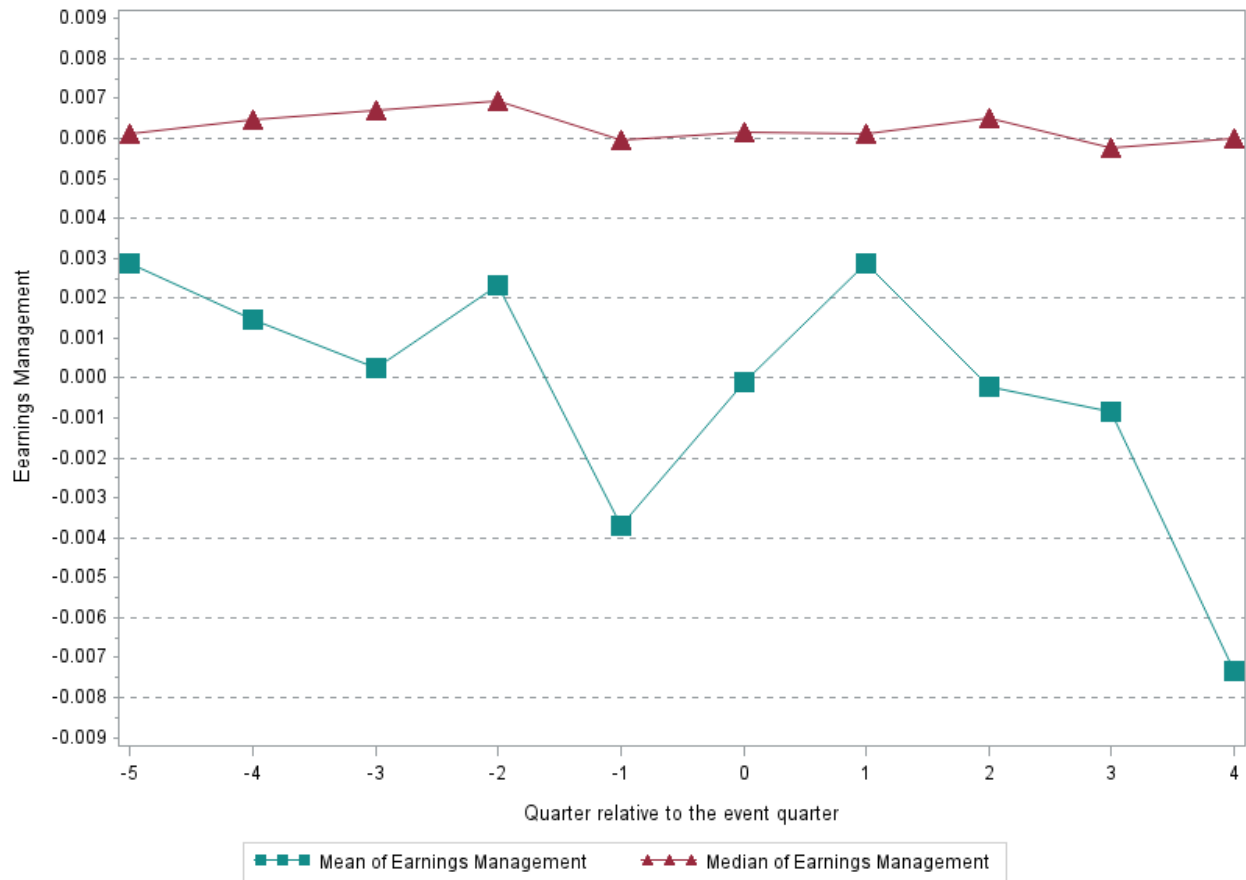


Figure 3

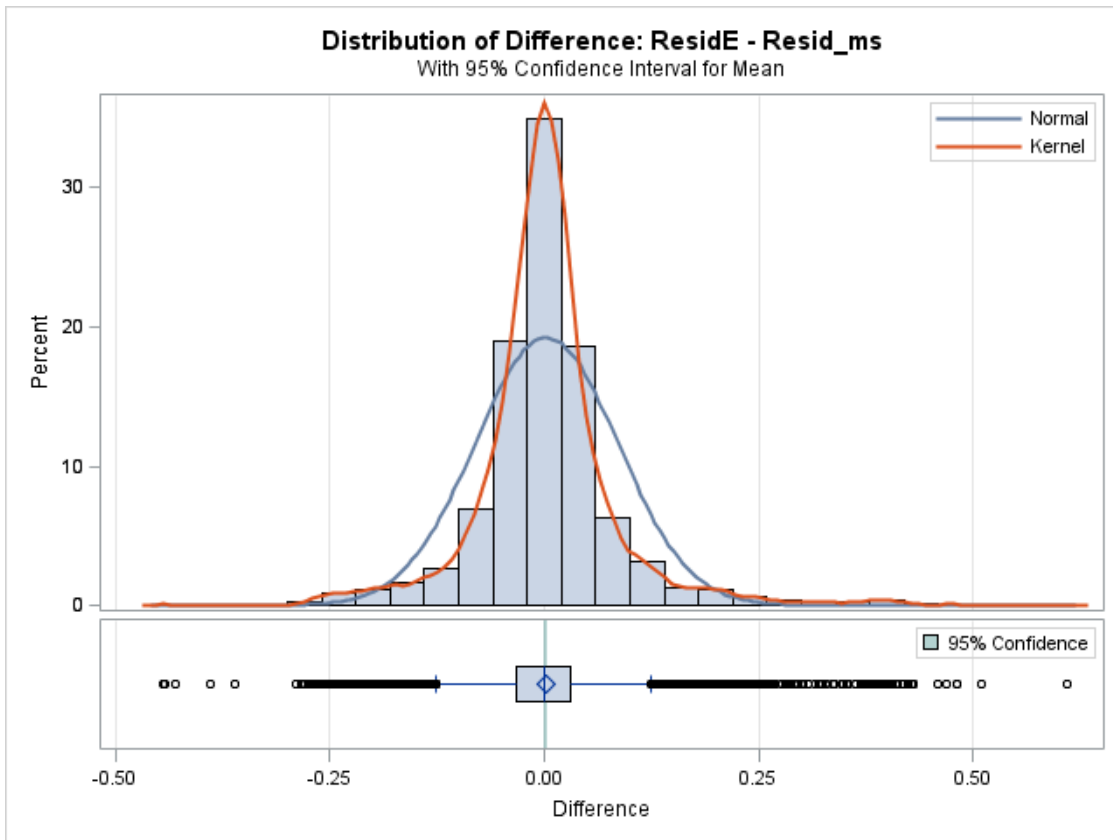
Distribution of difference of earnings management from rumour sample and match sample

The difference is unexplained earnings, which estimated from Jones Model, from rumoured target firms minus unexplained earnings from match sample firms.

The red line shows a Kernel Density Distribution of the difference of earnings management between rumour sample and match sample.

The blue line shows a Normal Distribution of the difference of earnings management between rumour sample and match sample.

The blue box displays the frequency of the difference of earnings management between rumour sample and match sample.



Appendices

Appendix A

Variable definition

Key Variable Definitions	
Return on Assets (ROA)	Net Income divided by total assets.
Leverage Ratio	The sum of long-term debt and debt in current liabilities divided by total assets.
Z-score	The sum of 1.2 times working capital over total assets, 1.4 times retained earnings over total assets, 3.3 times earnings before interests and taxes over total assets, 0.6 times market value of equity over book value of total liabilities, and sales over total assets.
Total Accruals	Total accruals refers to the difference between net income and operating cash flow. Followed Erickson and Wang (1999), operating cash flow is estimated by working capital from operation minus working capital accruals. Working capital from operations is the sum of income before extraordinary items (item 76), depreciations and amortization (item 77), extraordinary items and discounted operations (item 78), deferred taxes (item 79), equity in net loss (earnings) (item 80), sales of property, plant and equipment, gain or loss of sale of investment (item 102), and other funds from operation (item 76). Working capital accruals are calculated as the sum of changes in accounting payable (item 46), income tax payable (item 47), and other current liability (item 48), plus the sum of change in inventory (item 38), account receivable (item 37), and other current asset (item 39). For any item who calculated as a cumulative basis is adjust to reflect quarterly value.
Discretionary Accruals	The difference between total accruals and estimated total accruals predicted by Jones Model.
Q_t	Quarter 0 is the quarter which firms immediately release their quarterly earnings before rumour publication. Quarter – t is the tth quarter preceding quarter 0, Quarter t is the tth quarter following quarter 0, vice versa.
Target-initiated Rumour	The target firm starts the rumour e.g. they are considering strategic alternatives.
Distress Related Rumour	The target firm is rumoured in financial distress.
Advisor Hired Rumour	Target firm has retained the service of investment bank or advisor.