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Silence is golden? Responses to rumors by Chinese listed firms

Silence Is Golden?
Responses to Rumors by Chinese Listed Firms

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Highlights：

- Responses to rumors signal poor corporate governance quality
- The response predicts higher incidence of fraud detection and lawsuits
- The documents effects are concentrated on private firms

Abstract: Rumors are common in capital markets and firms face a strategic decision of whether or not to respond to them. This research explores the implications of official response to rumors and find that responded firms tend to experience enforcement actions against corporate fraud and lawsuits. The results are concentrated on private firms. Our results are in line with the agency theory interpretation of firms' response to rumors.

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1. Introduction

Rumors can be informative (Van Bommel, 2003) and have important implications on asset prices (Ahern and Sosyura, 2015). The development of information technologies, such as smartphone, 5G, internet and social media, facilitates the spread of information including rumors and provide multi-information channels to investors (Jia et al., 2020). While rumors are different in terms of credibility, Chou et al. (2015) show that the market cannot easily tell the difference in that the initial market reactions are indifferent. Jia et al. (2017) show that biased information from rumors may irrationally drive stock price and make impact on shareholder's wealth. Betton et al. (2018) find that takeover rumor rationales can predict future takeover announcements. Alperovych et al. (2021) provide evidence that M&A rumors of unlisted firms are deal breakers. In facing the rumors of listed firms, firms face a strategic decision of whether to make an official clarification. On the one hand, allowing rumors to spread may deviate the prices from its intrinsic value and negative rumors damage the public image of firms. On the one hand, the official responses potentially attracts attention from the public and regulators on the rumor and put firms under closer scrutiny. The consequence of the official response represents an important empirical question, and this study intends to shed light on it.

A number of studies have examined the stock price implications of the official response to rumors. Yang and Luo (2014) document that the subsequent abnormal return is positive in a bull market, but negative in a bear market. On the contrary, Wang (2019) find no effects on abnormal returns from digitalized rumor clarification on electronic information platforms. Agarwal et al. (2022) find that the influence of a clarification post is relatively more impactful for false rumors as compared to true rumors. This study contributes to this the growing literature on rumors and firms' response by looking beyond stock prices and offering new insights to the implications on the incidence of regulatory enforcement and lawsuits.

We first develop two opposite interpretations of firms' response to rumors. Agency theory suggests that mangers tend to pursue private benefits at the expenses of shareholders, and thus they use the response as cover-ups, which can lead to prosecutions. On the contrary, stewardship theory holds that managers are accountable for shareholders and therefore use the opportunities of official clarifications to disseminate accurate information, resulting in lower litigation risks. Since China has an established mechanism for listed firms to respond to rumors, we use the sample of Chinese listed firms from 2015 to 2018 to test the competing hypotheses. The results are in favor of the former in

that the responses are positively related to enforcement actions against fraud and lawsuits. In addition, we find that positive link is weakened by state controlling shareholders and financial analysts.

2. Hypotheses Development

Rumor as imprecise and ambiguity message about an impending economic event and could widely spread in markets (Admati and Pfleiderer, 1990). To prevent rumors misleading investors, Chinese regulator, China Securities Regulatory Commission, launched a mechanism for listed firms to respond to rumors through stock exchange with official clarifications[2]. It's under mangers' discretion to decide whether to proceed. Two different theories suggest opposite interpretations of the clarifications and the subsequent external governance outcome.

Agency theory proposed by Jensen and Meckling (1976) shows that due to separation of ownership and control, interest divergence exists between shareholder and executives. Managers tend to pursue self-interest rather than maximization of shareholders wealth (Fama, 1980; Fama and Jensen, 1983). From this point of view, managers selectively make clarifications when rumors contains serious negative information which could cause material loss on managers such as outrage of shareholders or inspection from regulators. In other cases, mangers do not have strong incentives to do so. This conjecture is in line with the results in Wang et al. (2019b) that Chinese firms only make 184 clarification announcements for as many as 12,663 rumors. Dyck et al. (2011) show that analysts, media, employees, investors, and stakeholders among others play an external monitoring role to whistleblow the risk of corporate fraud. The responses are therefore likely to be cover-ups when firms face accusations from the public and are unlikely to be successful to dispel doubts and concerns. We propose the following hypothesis:

H1a: The response to rumors is positively related to enforcement actions and lawsuits

In contrast to agency theory, stewardship theory assumes the executives are responsible steward to the shareholders to maximize shareholder wealth (Dalton et al., 2007; Davis et al., 1997). From this perspective, the decision made by managers to make clarifications are not for cover-ups of wrongdoings but to combat fake news and disinformation to protect the interest of shareholders. Most rumors contain inaccurate information. Alperovych et al. (2020) note that rumors are sometimes

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[2] The first regulation was issued in 1996 titled Notice of China Securities Regulatory Commission on Issues Concerning the Announcement of Clarification by Listed companies. It was updated by the Administrative Articles for Information Disclosure of Listed Companies published in 2007 which further specified the disclosure terms and requirements.

created by market manipulator. Without proper clarifications, they develop false expectations and in turn harm shareholder wealth (Betton, 2018). The stewardship theory suggests that the motivation behind response to rumors is to help shareholders avoid potential information risks. Such response also enhances the information environment of the firm by spanning information between inside and outside of the firm (Wang et al., 2019a). As a result, firms are less likely to be involved in lawsuits or enforcement actions. We propose the following hypothesis:

H1a: response to rumors is negatively related to enforcement actions and lawsuits

3. Data and Sample
3.1 Data

To perform the analyses, we construct a firm-year panel data sample between 2015 and 2018 for all the A-share of Chinese listed companies. The responses to rumor are collected from Wind and other firm-level data are from CSMAR. Since Shanghai stock exchange has modified the listed firm information disclosure evaluation method in 2015, we choose 2015 as the beginning of the sample to avoid potential bias. The sample size is 10,465, and we winsorize variables at top and bottom 1%. Table 1 presents descriptive statistics and the Appendix lists variable definitions. In Table 1 shows that the incidence of responding to rumours is 8.5%. The likelihood of involving in lawsuits and enforcement action against fraud is 24.3% and 15% respectively.

[Insert Table 1 about here]

3.2 Models

To test the hypotheses, we use the following regression model:

$$Fraud_{j,k} = \alpha + \delta Rumor_{j,k} + \sum_{i=1}^{n} \beta_i \, Control_{j,k} + \varepsilon_{j,k} \quad (1)$$

The dependent variables are indicators of either enforcement actions against frauds or lawsuits. *Fraud* equals to 1 if one or more enforcement actions are imposed on the firm by the regulator in the year and 0 otherwise. *Lawsuit* equals to 1 if the firm is sued in the year and 0 otherwise. The explanatory variable *Rumor* is also a dummy variable equals to 1 if a firm responds to rumours in the year, and 0 otherwise. We use probit model and apply with fixed effect at industry and year level. The control variables are defined in the Appendix.

4. Empirical Results
4.1 Baseline results

Table 2 presents the regression results. The coefficient of *Rumor* is 0.243 (0.149) and statistically significant in the regression of enforcement action against fraud (lawsuits), suggesting that response to rumours is positively associated with fraud prosecution (accusation). When we combine both *Fraud* and *Lawsuit* as a new dependent variable, the results remain consistent. The results support H1a and the interpretation of rumour clarifications on the perspective of agency problem, suggesting such clarifications are likely to be unsuccessful cover-ups of wrongdoing.

In addition, we examine two factors that may affect the documented association. The first one is the state entity of listed firms. Hou and Moore (2010) find that certain SOEs (state-owned-enterprises) can get away from fraud prosecution with their political connections. We therefore partition the sample into SOEs and non-SOEs. As we expected, we find that the positive association argued in H1a are concentrated in the sample of private firms. We also consider the role of financial intermediaries. For firms which are actively followed by financial analysts, the information asymmetry is low leaving a smaller room for rumours and the subsequent clarifications. We incorporate an interaction term of an analyst coverage and response to rumours in the regression model and find its coefficient to be significantly negative suggesting that the positive association argued in H1a is concentrated in the firms which have lower analyst coverage.

[Insert Table 2 about here]

4.2. Robustness Tests

Because firms do not randomly choose rumors to respond, it is possible that other rumor-specific variables may drive both the response strategy and the enforcement and litigation outcomes. We make efforts to employ an instrumental variable (IV) to mitigate the concern, which is based on how active a firm has been to respond to investors' online enquiries. Specifically, it is the length of time that a firm reply to investor's question on the internet platform. We believe that the length represents a track-record of a firm to engage with shareholders and stakeholders online to provide information and could be a plausible proxy to the rumor clarification strategy. Meanwhile, the length itself is unlikely to affect fraud detection and lawsuits directly. The results reported in Table 3 are in line with the baseline results.

In the meantime, we also the propensity scoring matching (PSM) method of 1-1 matching with no replacement to match each firm that has respond to the rumor with another otherwise identical counterpart which is expected to respond but does not. This approach makes the firms in our sample more comparable in terms of the selected matching co-variates and help to mitigate the concern that

the baseline results are driven by firm characteristics. The results reported in Table 3 remain consistent with our baseline results on the agency-theory-based interpretation of rumor clarifications.

[Please insert Table 3 about here]

4.3. Additional Analyses

Finally, we explore the link between rumor clarification and other firm outcomes. The agency-theory-based interpretation of the rumor clarifications implies the deterioration of profitability and governance quality. The additional results in Table 4 confirm these predictions. The rumor response is significanly and negatively related to ROA (return on assets), the dissenting opinion of outside directors in corporate board meetings (activism) and modified audit opinions (MAO). These results further support the notion that firms respond to rumors as cover-ups of wrongdoing.

In this table, we also partition the sample based on state entity of firms (i.e. SOEs Vs private firms). We showed earlier in Table 2 that since some SOEs enjoy favourable treatment with their political connections, the H1a is more pronounced among private firms. In Table 4, we document consistent results that the negative link between rumor clarification and deteriorated ROA and governance quality are observed in the sample of private firms but not in the sample of SOEs.

[Insert Table 4 about here]

5. Conclusion

Social media and internet are important tools for investors to acquire information, but rumors are often spread on them as well. This paper empirically examines the association between firms' response to rumors and regulatory enforcement and lawsuit outcomes. The results show that the clarification made by firms in response to rumors are associated with a higher incidence of regulatory actions against fraud and lawsuits. The results are in line with the interpretation on the perspective of agency problem that firms choose to respond to rumors when they try to cover up their wrongdoings. The results add to the growing literature on rumors in capital markets.

One limitation of this paper is that we do not analyze the content of the rumors on the internet. Some rumors contain false or misleading information and could be spread by fraudsters to manipulate stock price, but some rumors could be informative and whistleblowing of fraudulent risks. Future study may analyze the rumor content with textual analysis tools such as Linguistic Inquiry and Word Count (LIWC) to study the textual characteristics of rumor posts to infer their credibility and examine their effects.

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Table 1 Descriptive Statistics
This table presents the descriptive statistics. Varaibls are defined in the Appendix.

Variable	N	SD	MEAN	P25	P50	P75
Activism	10465	0.112	0.013	0	0	0
Analyst_Coverage	10465	9.221	7.876	1	4	11
Big4	10465	0.255	0.07	0	0	0
Board Meeting Freq.	10465	4.143	10.526	8	10	13
BoardSize	10465	1.785	8.565	7	9	9
BTMV	10465	1.267	1.046	0.342	0.62	1.196
Fraud	10465	0.357	0.15	0	0	0
Herfindahl_10	10465	0.111	0.158	0.075	0.13	0.211
Lawsuits	10465	0.429	0.243	0	0	0
Leverage	10465	0.5	0.492	0	0	1
Ln(MV)	10465	0.924	15.963	15.323	15.848	16.489
MAO	10465	0.176	0.032	0	0	0
OD_Indepr	10465	0.054	0.377	0.333	0.364	0.429
ROA	10465	0.067	0.035	0.014	0.035	0.065
Rumor	10465	0.279	0.085	0	0	0
SalesGrowth	10465	0.571	0.226	-0.008	0.121	0.301

Table 2. Response to Rumours and

This table reports the results of probit regression on the association between enforcement action against fraud (and lawsuits) and response to rumours. The sample is partitioned based on whether firms are state-owned enterprises (SOEs). Variables are defined in the Appendix. All t-statistics are reported and adjusted for heteroskedasticity. The superscripts *, **, and *** denote the 10%, 5%, and 1% levels of significance, respectively.

	Fraud			Lawsuit			Fraud & Lawsuit			Fraud	Lawsuit	Fraud & Lawsuit
	Full Sample	SOE=0	SOE=1	Full Sample	SOE=0	SOE=1	Full Sample	SOE=0	SOE=1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Rumor	0.243***	0.266***	0.180*	0.149***	0.164**	0.125	0.238***	0.272***	0.180**	0.344***	0.344***	0.330***
	(4.58)	(4.28)	(1.79)	(2.90)	(2.46)	(1.55)	(4.96)	(4.52)	(2.25)	(4.87)	(4.87)	(5.17)
OD_Indepr	-0.112	-0.044	0.061	-0.078	0.121	-0.001	0.060	0.234	0.205	-0.123	-0.123	0.049
	(-0.32)	(-0.09)	(0.11)	(-0.17)	(0.19)	(-0.00)	(0.16)	(0.46)	(0.35)	(-0.36)	(-0.36)	(0.13)
Board Meeting Freq.	0.026***	0.021***	0.030***	0.015***	0.019***	0.016**	0.023***	0.022***	0.025***	0.026***	0.026***	0.023***
	(6.52)	(4.17)	(4.42)	(3.29)	(3.17)	(1.97)	(5.46)	(4.40)	(3.32)	(6.47)	(6.47)	(5.43)
BoardSize	0.003	0.007	0.010	0.012	0.017	-0.007	0.016	0.020	0.007	0.003	0.003	0.015
	(0.29)	(0.40)	(0.58)	(0.86)	(0.75)	(-0.34)	(1.30)	(1.08)	(0.41)	(0.23)	(0.23)	(1.19)
BTMV	-0.032	-0.054*	0.007	0.025	-0.006	0.031	0.019	-0.011	0.035	-0.038*	-0.038*	0.010
	(-1.61)	(-1.91)	(0.23)	(1.21)	(-0.21)	(1.03)	(1.01)	(-0.41)	(1.30)	(-1.91)	(-1.91)	(0.56)
Ln(MV)	-0.002	0.026	-0.053	-0.002	0.051	-0.073	-0.013	0.043	-0.093**	0.058**	0.058**	0.060**
	(-0.10)	(0.86)	(-1.39)	(-0.07)	(1.35)	(-1.51)	(-0.49)	(1.34)	(-2.17)	(2.18)	(2.18)	(2.09)
ROA	-2.303***	-2.570***	-1.294**	-1.109***	-1.024***	-1.552***	-1.879***	-1.984***	-1.884***	-2.074***	-2.074***	-1.567***
	(-9.64)	(-9.67)	(-2.35)	(-4.29)	(-3.43)	(-2.76)	(-7.93)	(-7.41)	(-3.49)	(-8.54)	(-8.54)	(-6.61)
Leverage	0.129***	0.185***	0.030	0.188***	0.217***	0.051	0.161***	0.201***	0.022	0.141***	0.141***	0.175***
	(3.50)	(4.22)	(0.43)	(4.34)	(4.16)	(0.65)	(4.35)	(4.63)	(0.31)	(3.84)	(3.84)	(4.73)
SalesGrowth	-0.008	-0.024	0.011	0.015	-0.018	0.109***	0.015	-0.006	0.077*	-0.011	-0.011	0.010
	(-0.28)	(-0.69)	(0.22)	(0.58)	(-0.56)	(2.59)	(0.65)	(-0.20)	(1.81)	(-0.39)	(-0.39)	(0.42)
Herfindahl_10	-0.789***	-0.729***	-0.662**	-0.048	-0.095	-0.274	-0.330*	-0.230	-0.531**	-0.890***	-0.890***	-0.460***
	(-4.82)	(-3.42)	(-2.46)	(-0.24)	(-0.36)	(-0.92)	(-1.94)	(-1.00)	(-2.00)	(-5.38)	(-5.38)	(-2.69)
Big4	-0.255***	-0.036	-0.467***	0.083	0.167	0.071	-0.023	0.133	-0.084	-0.234***	-0.234***	-0.005
	(-3.11)	(-0.33)	(-3.90)	(0.93)	(1.30)	(0.59)	(-0.29)	(1.23)	(-0.76)	(-2.88)	(-2.88)	(-0.06)
Rumor_Analyst_Coverage										-0.013**	-0.013**	-0.011**
										(-2.30)	(-2.30)	(-2.18)
Analyst_Coverage										-0.009***	-0.009***	-0.011***
										(-3.60)	(-3.60)	(-4.51)
_cons	-1.229***	-1.694***	-0.642	-0.641	-1.612**	0.731	-0.378	-1.349**	0.968	-2.077***	-2.077***	-1.389***
	(-3.24)	(-3.18)	(-1.10)	(-1.36)	(-2.51)	(1.00)	(-0.93)	(-2.45)	(1.48)	(-4.98)	(-4.98)	(-3.08)
Different in meantest on rumor coefficient of two sub-sample	Chi2=0.53			Chi2=0.14			Chi2=0.84					
N	10465	6922	3543	10465	6922	3543	10465	6922	3543	10465	10465	10465
pseudo R^2	0.049	0.050	0.058	0.048	0.049	0.045	0.047	0.049	0.051	0.052	0.052	0.051
chi2	379.478	276.313	141.263	281.589	206.900	101.403	351.742	262.188	127.329	397.532	397.532	380.696

Table 3. Robustness checks

This table reports the results of PSM and IV analyses. The dependent variables are dummy variables of enforcement actions against fraud, lawsuits and their combination. The main explanatory dummy variable is the response to rumors. The IV is the length of time that a firm response to investor's question on the internet platform. Variables are defined in the Appendix. All t-statistics are reported and adjusted for heteroskedasticity. The superscripts *, **, and *** denote the 10%, 5%, and 1% levels of significance, respectively.

	PSM			**IVs**		
	Fraud	Lawsuit	Fraud & Lawsuit	Fraud	Lawsuit	Fraud & Lawsuit
Rumor	0.240***	0.114*	0.206***	3.347***	2.816***	3.328***
	(3.28)	(1.72)	(3.22)	(11.90)	(3.51)	(11.18)
OD_Indepr	-0.829	-0.478	-0.323	-0.116	0.084	0.044
	(-1.15)	(-0.63)	(-0.48)	(-0.41)	(0.29)	(0.17)
Board Meeting Freq.	0.034***	0.018**	0.033***	0.002	0.004	0.001
	(4.14)	(2.16)	(4.30)	(0.28)	(0.45)	(0.19)
BoardSize	-0.007	0.012	0.026	0.003	0.016	0.013
	(-0.26)	(0.50)	(1.22)	(0.33)	(1.48)	(1.29)
BTMV	-0.022	0.046	0.023	-0.013	0.016	0.009
	(-0.58)	(1.23)	(0.65)	(-0.79)	(1.12)	(0.72)
Ln(MV)	-0.055	-0.006	-0.040	-0.147***	-0.130***	-0.153***
	(-1.09)	(-0.12)	(-0.86)	(-6.19)	(-3.22)	(-7.22)
ROA	-2.408***	-1.494***	-2.373***	-0.202	0.005	-0.031
	(-5.20)	(-3.27)	(-5.12)	(-0.38)	(0.01)	(-0.07)
Leverage	0.022	0.189**	0.118	0.004	0.087	0.029
	(0.26)	(2.28)	(1.54)	(0.12)	(1.39)	(0.71)
SalesGrowth	-0.014	0.031	0.043	0.014	0.038	0.037
	(-0.22)	(0.59)	(0.86)	(0.56)	(1.58)	(1.63)
Herfindahl_10	-0.596*	-0.155	-0.321	-0.188	0.023	-0.030
	(-1.77)	(-0.47)	(-1.04)	(-0.90)	(0.15)	(-0.20)
Big4	-0.407***	0.016	-0.122	-0.224***	-0.045	-0.127**
	(-2.71)	(0.11)	(-0.93)	(-3.28)	(-0.56)	(-2.36)
_cons	-0.091	-0.503	0.021	1.528***	1.282*	1.846***
	(-0.11)	(-0.62)	(0.03)	(2.82)	(1.65)	(4.52)
N	1782	1782	1782	8041	8041	8041
pseudo R^2	0.072	0.058	0.065	N/A	N/A	N/A
chi2	114.895	87.176	130.004	3295.182	1293.263	3776.609

Table 4. Additional Analyses

This table reports the the association between responses to rumors (*Rumor*) and other firm outcomes, namely Return on Asset (*ROA*), dissenting opinions from outside directors in corporate board meetings (*OD Activism*) and modified auit opionios (*MAO*). The sample is sometimes partitioned based on whether the firms are state-owned-enterprises (*SOE*). Variables are defined in the Appendix. All t-statistics are reported and adjusted for heteroskedasticity. The superscripts ∗, ∗∗, and ∗∗∗ denote the 10%, 5%, and 1% levels of significance, respectively.

	ROA			OD Activism			MAO		
	Full Sample	SOE=0	SOE=1	Full Sample	SOE=0	SOE=1	Full Sample	SOE=0	SOE=1
	(1)	(2)	(3)	(7)	(8)	(9)	(10)	(11)	(12)
Rumor	-0.009***	-0.010***	-0.002	0.098*	0.181***	-0.020	0.410***	0.515***	-0.044
	(-3.80)	(-3.04)	(-0.94)	(1.84)	(2.64)	(-0.23)	(5.15)	(5.87)	(-0.19)
OD_Indepr	-0.071***	-0.061**	-0.042**	0.823*	0.815	1.123	-0.044	0.769	-1.653
	(-4.10)	(-2.40)	(-1.98)	(1.69)	(1.21)	(1.55)	(-0.06)	(0.84)	(-1.31)
Board Meeting Freq.	-0.001***	-0.001***	-0.001**	0.004	0.007	0.016*	0.012	0.012	-0.006
	(-4.87)	(-4.73)	(-2.39)	(0.84)	(1.08)	(1.82)	(1.56)	(1.32)	(-0.35)
BoardSize	-0.000	0.001	-0.000	0.060***	0.049**	0.018	0.003	0.011	0.030
	(-0.61)	(1.20)	(-0.32)	(3.69)	(2.00)	(0.76)	(0.12)	(0.27)	(0.71)
BTMV	-0.007***	-0.010***	-0.007***	0.098***	0.096**	0.042	-0.014	0.026	0.025
	(-9.40)	(-6.87)	(-8.24)	(4.05)	(2.51)	(1.32)	(-0.37)	(0.57)	(0.33)
Ln(MV)	0.026***	0.030***	0.019***	0.064*	0.163***	-0.098*	-0.075	-0.042	-0.165*
	(24.47)	(22.08)	(11.93)	(1.95)	(3.81)	(-1.85)	(-1.49)	(-0.67)	(-1.94)
Leverage	-0.034***	-0.035***	-0.025***	0.138***	0.088	0.069	0.290***	0.343***	0.141
	(-19.50)	(-15.73)	(-9.18)	(2.86)	(1.46)	(0.82)	(3.80)	(4.01)	(0.88)
SalesGrowth	0.018***	0.019***	0.013***	-0.011	0.033	-0.032	0.091*	0.116*	-0.042
	(13.63)	(11.32)	(7.46)	(-0.43)	(1.07)	(-0.76)	(1.65)	(1.95)	(-0.24)
Herfindahl_10	0.055***	0.105***	0.002	-0.678***	-1.364***	-0.717**	-0.879**	-0.990**	-0.247
	(7.71)	(9.89)	(0.18)	(-2.93)	(-3.96)	(-2.12)	(-2.34)	(-2.19)	(-0.38)
Big4	-0.004	-0.003	0.003	-0.129	-0.238	-0.016	-0.370**	-0.546**	-0.080
	(-1.42)	(-0.76)	(0.99)	(-1.18)	(-1.32)	(-0.12)	(-1.98)	(-2.14)	(-0.31)
ROA				-1.329***	-1.484***	-0.875	-6.171***	-5.744***	-7.785***
				(-4.82)	(-4.58)	(-1.49)	(-18.94)	(-16.37)	(-9.80)
_cons	-0.321***	-0.417***	-0.208***	-2.360***	-3.772***	0.566	-0.717	-1.511	0.521
	(-18.47)	(-17.04)	(-8.59)	(-4.49)	(-5.15)	(0.71)	(-0.92)	(-1.44)	(0.43)
Different in mean test on rumor coefficient of two sub-sample	Chi2=4.79***			Chi2=0.76			Chi2=5.18**		
N	10465	6922	3543	10465	6922	3543	10465	6922	3380
pseudo R^2	0.213	0.2344	0.2227	0.042	0.054	0.021	0.265	0.281	0.279
chi2	.N/A	N/A.	N/A.	328.761	211.426	55.191	658.994	555.870	165.344

Appendix. Variable Definations

Analyst_Coverage	Analyst Coverage equals to the total analyst or group of analyst covering the firm during the year.
Board Meeting Freq.	Board Meeting Freq. equals to the times of corporate board meeting held in a certain year.
BoardSize	BoardSize is an ordinary variable equals to the amount of directors in the board.
BTMV	BTMV equals to book value divide the market value of the firm at the end of the year.
Big4	Big 4 is a dummy variable equals to 1 if the firm is audited by the big 4 auditing firm, otherwise equals to 0.
Fraud	Fraud is a dummy variable equals to 1 if the firm received at least 1 enforcement against fraud by
Herfindahl_10	Herfindahl_10 measures the ownership concentration by the largest 10 shareholders.
Lawsuits	Lawsuits is a dummy variable equals to 1 if the firm involve in at least 1 lawsuit during the year otherwise equals to 0.
Leverage	Leverage is a dummy variable equals to 1 if the the liability dvide the total asset of the firm is above the value in the same industry same year, otherwise equals to 0.
Ln(MV)	Ln(MV) is the log form of the market value of the firm at the end of the year.
MAO	MAO is a dummy variable equals to 1 if the firm receives modified auditor opinion for its annual report otherwise equals to 0.
OD_Activism	Od_Activism is a dummy variable equals to 1 if there is at least 1 outside director issue dissenting opinion duringthe board meeting in a year, otherwise equals to 0.
OD_Indepr	OD_Indepr is a percentage value equals to the number of outside directors sitting in the boardduring the year divide the board size.
ROA	ROA is a continuous variable equals to the return on asset in the current year.
Rumor	Rumor is a dummy variable equals to 1 if there is at least 1 rumor response announcement during the year, otherwise equals to 0.
SalesGrowth	SalesGrowth is the sales growth of the firm during the year. ROA is the ratio calculated by the return divide the total asset
SOE	SOE is a dummy variable equals to 1 if the government is controlling shareholder, otherwise equals to 0.