The impact of Media Sentiment on Firm Risk, Corporate Investment and Financial Policies

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Abstract

This study investigates the association between media sentiment and a comprehensive set of corporate decision making measures that capture firm, corporate investment, and financial policy risk. This study predicts that CEOs who achieve greater media coverage are more risk-seeking. We find a positive association between media sentiment and the volatility of future firm stock returns, research and development expenditures and cash holdings. CEOs are more overconfident when estimating returns and risk when media sentiment is strong and positive. CEOs are more risk-seeking when sentiment is negative in an attempt to salvage firm reputation and increase personal wealth. Liquidity is used to hedge risk when firms and CEOs face increased media coverage. Our findings support the role of media sentiment as an external mechanism monitoring firm risk and policies.

Keywords: Media sentiment, volatility of stock return, investment and financial policies, risk-seeking behaviour

JEL classification: G32, G34

1 Introduction

The corporate governance role of the media has started to receive more attention as academic researchers attempt to better understand how the media can influence firms' and managers' behaviour. The media can affect firm issues in one of three ways as documented by Bednar et al. (2013). First, as an external mechanism, the media provides a platform to publicize the firm's point of view. The media increases the size and visibility of firm movements and ultimately can affect firm action by collecting, aggregating, disseminating and amplifying information (King and Soule, 2007; Bednar et al., 2013). Second, the media acts as a mirror, conveying information or reporting on the events that occur within the corporate landscape. These events, as reported by media, can also influence public attitude and opinion, and even change the subsequent results of events. A substantial and growing literature links the media to observable firm outcomes (Bushee et al., 2010; Bednar, 2012; Gurun and Butler, 2012; Bednar et al., 2013; Liu and McConnell, 2013; Liu et al., 2017). Zingales (2000) shows that the media do play an important role in guiding firm decisions. Third, the media as an independent investigator can report on or publicize information. In this function, media can be a watchdog to reduce information asymmetry between inside and outside stakeholders (Djankov et al., 2003; Strömberg, 2004; Bednar, 2012).

Prior research has largely focused on the implications of media coverage to firm performance and acquisition decisions (Bednar et al., 2013; Liu and McConnell, 2013). However, there is little evidence on whether: (1) there is any association between media sentiment and firm risk; (2) there is any link between media sentiment and firm risk, or media sentiment and corporate investment, and policy choices; and (3) the specific mechanisms through which CEOs with large media sentiment manage their firms more aggressively and speculatively. Our study attempts to fill this gap in the corporate finance literature by examining the association between media sentiment and firm risk, corporate investment, and financial policies.

Our sample consists of 4,352 firm-year observations sourced from Execucomp during 1996 to 2014. We measure the tone of all the news reports sourced from Factiva for each CEO during

each year of the sample. Each article is then analysed using PERL software, categorising the sentiment of each article based on the level of positive, negative, uncertain, litigious, weak modal and strong modal tones using the financial dictionary proposed by Loughran and McDonald (2011). The six media sentiments are then classified into two broader groups referred to as good news and bad news. The good news group includes strong modal and positive sentiments and the bad news group includes negative, weak modal, uncertain and litigious sentiments.

We find that media sentiment (excluding litigious sentiment) is positively associated with a firm's total and idiosyncratic risk. News associated with widespread media sentiment leads to risky firms as evidenced by the sensitivity of stock return volatility to public media sentiment. Additional analysis reveals that the increase in firm risk is associated with more risky investment policies that support our supposition that a risky firm prefer to take aggressive investment projects, and the adoption of more conservation financial policies that is consistent with Acharya et al. (2012) that a conservative cash policy is more likely to be pursued by a firm that finds itself close to distress. We find a positive association between media sentiment (excluding weak and litigious sentiment) and research and development (R&D) expenditures. The result is consistent with our prediction that CEOs of firms that experience greater media sentiment (both good and bad) prefer investment policies that are more risky. We also find a positive association between negative sentiment (weak modal) and working capital, and between media sentiment (excluding litigious sentiment) and cash holdings. In contrast, there is a negative association between positive sentiment and financial leverage. Finally, there is no association between litigious sentiment and the volatility of stock return or the riskiness of firm investment and financial policies. One potential explanation for the lack of association is that when a CEO is exposed to widespread litigious media coverage, shareholders may question the CEO's actions and demand the CEO's resignation or even fire the CEO to avoid a potential firm crisis.[1]

[1] The crisis could be associated with decisions affecting firm growth or questions regarding the management and leadership decisions made by the CEO (Schwartz and Menon, 1985; Eckbo and Thorburn, 2003).

As a further test, we group the six individual media sentiments into two broader categories labelled "Good" (includes strong modal and positive) and "Bad" (includes negative, weak modal, uncertainty, litigious). We re-run our empirical tests and find largely consistent results. To address questions regarding potential reverse causality in that firm risk, investment, and financial policies may drive media sentiment, we estimate a two-stage least squares (2SLS) regression using the ratio of advertising expenditure to total assets as our instrumental variable. Our robustness tests provide results consistent with the main findings.

Our study makes several important contributions. First, this paper extends research on the influence of media on firm risk by investigating media sentiment as a triggering mechanism. Prior literature reports the role of media in: (1) detecting financial fraud (Miller, 2006; Dyck et al., 2008); (2) impacting executive compensation (Core et al., 2008; Kuhnen and Niessen, 2012); (3) influencing strategic change (Bednar et al., 2013); (4) affecting managers' capital allocation decisions (Liu and McConnell, 2013); and (5) impacting CEO turnover (You et al., 2017). We depart from prior research by focusing on how media sentiment affects the volatility of stock returns. We also provide important evidence that widespread media sentiment leads to more risky firms. In addition, media can be an outsider monitor to mediate the firm's level of risk, investment activities, and the financial policies. There is a burgeoning literature on the impact of media sentiment on corporate outcomes (Gurun and Butler, 2012; Bednar et al., 2013; Liu and McConnell, 2013). We differ from prior research by analysing the influence of media coverage on corporate investment and financial policies.

Second, we examine the effects of the six independent measures of media sentiment. Previous studies generally consider the effect of negative media coverage only with very few studies looking at the other classifications of media sentiment (Bednar, 2012; Bednar et al., 2013). Bajo and Raimondo (2017) show that positive media sentiment is positively associated with the level of observed IPO underpricing. Guldiken et al. (2017) indicate that the uncertainty in tone of media coverage about the IPO firm adversely influences its stock price. However, there are very few

studies that consider the six media sentiment categories employed in our study as defined by Loughran and McDonald (2011). This study therefore captures the overall governance effect of the media's news dissemination role.

Third, this paper extends the research on managerial behaviour. Media coverage can reflect CEO characteristics (Core et al., 2008; Liu and McConnell, 2013; Liu et al., 2017; You et al., 2017). Our study provides evidence that greater negative media sentiment leads to higher levels of risk-seeking behaviour. The result suggests that a CEO is more likely to manage a firm with greater risk and prefer more risky investment policies if the CEO received a high score for the positive media sentiment category. This is consistent with the notion that CEO overconfidence may cause a subsequent overestimate of investment returns and correspondingly underestimate the level of firm risk exposure (Dittrich et al., 2005). Additionally, a higher score for the negative media sentiment category will result in a risk-seeking CEO avoiding any loss of benefits.

The paper is organized as follows. Section 2 provides an overview on media coverage, the relationship between the media and firm risk, and the link between media sentiment, investment and financial policies to develop our hypotheses. Section 3 describes the sample, the construction of our variables, and our methodology. The empirical results are presented in Section 4 and robustness tests are presented in Section 5. Section 6 concludes the paper.

2 Prior literature and hypothesis development

The media plays an important role in corporate governance by collecting and disseminating information about firms (Zingales, 2000; Fang and Peress, 2009; Bednar, 2012). The media can help to increase the transparency and credibility of firms. Miller (2006) reports that the media can detect corporate financial fraud and convey financial information to boards of directors.

The media also conveys information about events, influencing public attitude and behaviour related to those events. Investors may change their investment decisions via information exposure. Bednar et al. (2013) introduce a new theoretical framework to strategic management by examining

the effect of media coverage on the extent of strategic change. Overall these findings show that CEO media coverage can influence the firm outcomes.

The media may prompt the likelihood of firm action by making events more salient to decision makers (Bednar et al., 2013). Media does influence firm behaviour and this is consistent with the attention-based view that managers make decisions based on where they concentrate their interest (Ocasio, 1997; Bednar et al., 2013). Liu and McConnell (2013) show that managers abandon a value-reducing acquisition decision because they are likely to be influenced by the level and the tone of media. Managers have to align their wealth, firm return and shareholder's interests when exposed to negative media exposure which place managers' reputation capital at risk. This suggests that the media affects firm outcomes and behaviour by capturing managers' attention and reactions.

The stream of research typically focuses on how positive (negative) media coverage can increase (decrease) the wealth and reputation of both executives and firms (Core et al., 2008; Gurun and Butler, 2012; Chen et al., 2013; Love et al., 2017), and its effect on firm decision-making (Bednar et al., 2013; Liu and McConnell, 2013). However, despite this impressive body of work, there is little research exploring how external party evaluations can play a role in determining firm risk. In this section, we begin by describing theories to explain why media sentiment is expected to influence the volatility of stock return. We then consider the possible channels of the influence of media sentiment on the riskiness of investment and financial policies.

2.1 The volatility of firm stock returns

It is widely assumed that the CEO affects firm risk-taking. Exiting literature has attempted to identify the influence of CEO characteristics on firm risk. Li and Tang (2010) report the positive relationship between CEO hubris and firm risk taking and examine the moderating role of managerial discretion in this relationship. CEO reputation also reduces potential firm risk (Shemesh, 2017). Managerial compensation may lead risky firms (Coles et al., 2006; Eccles et al.,

2007; Low, 2009). Cassell et al. (2012) posit that a CEO with large insider debt holding is more likely to reduce the riskiness of firm operations. In addition, CEO characteristics matter to the media. First, the media provides a platform to publicize the CEO's views concerning their compensation (Core et al., 2008; Finkelstein et al., 2009; Chen et al., 2013). Second, the media may change public attitude toward a CEO. Prior research reports that stakeholders often overweight external signals of reputation when evaluating a CEO (Khurana, 2002; Wade et al., 2006). Based on prior literature, we investigate the implications of media sentiment on the volatility of stock return.

The earlier studies try to explain the influence of public information on firm risk. Luo (2007) document that higher levels of current consumer negative voice affect firms' future idiosyncratic stock returns. Fang and Peress (2009) suggests that information embedded in news stories contributes to stock return that demonstrates greater idiosyncratic risk. The results also are consistent with the notion that greater outside exposure increases the riskiness of firm operations (as proxied by the volatility of stock returns) because media coverage is sensitive to the volatility of the underlying stock return. Positive category sentiment may increase the riskiness of firm operations because overconfident CEOs underestimate firm risk (Dittrich et al., 2005; Malmendier and Tate, 2005; Li and Tang, 2010). In contrast, CEOs that received positive media coverage may decrease the riskiness of a firm in an attempt to protect firm value and their own wealth. Shemesh (2017) find that firms with award-winning CEOs decrease their idiosyncratic volatility. In addition, negative media coverage could reduce firm risk-taking because CEOs play safe by preserving firm performance and reducing the probability of bankruptcy (Cassell et al., 2012). We also expect the riskiness of firm operations to increase subsequent to negative media exposure. The reason is that, in order to achieve wealth maximization, CEOs choose to ignore the influence of the media at no personal cost to themselves. This is consistent with Core et al. (2008) who find no evidence of an association between a firm's response to negative media coverage and higher CEO turnover. Based on the above arguments, we present our first hypothesis as follows:

H1a: CEOs in the good news group (strong modal and positive sentiment) are positively (or negatively) related to the volatility of future firm stock returns.

H1b: CEOs in the bad news group (negative, weak modal, uncertain and litigious sentiment) are positively (or negatively) related to the volatility of future firm stock returns.

2.2 The riskiness of firm investment and financial policies

A large component of research provides evidence that the media affects CEO characteristics. Positive media coverage may enhance a CEO's reputation so that stakeholders view the CEO as more valuable (Hayward et al., 2004; Bednar, 2012). In contrast, negative press causes CEOs to be less marketable and leads firms to reduce their compensation. In addition, CEOs play an important role in making corporate policies. Overconfident CEOs overestimate the return to their investment projects and view external funds as unduly costly (Malmendier and Tate, 2005). Cain and McKeon (2016) argue that risk-taking CEOs are associated with significantly higher leverage and acquisition activity. Thus, we expect that media can affect corporate policies.

The media has received more attention in the corporate finance literature as academic researchers have attempted to better understand how the media may influence different firm outcomes in the role of social arbiter (Pollock and Rindova, 2003; Bednar et al., 2013; Liu and McConnell, 2013). Previous research shows that positive media coverage can keep the celebrity status of firms and managers, suggesting that their celebrity status could affect a variety of subsequent firm behaviours and outcomes (Hayward et al., 2004; Rindova et al., 2006). Widespread negative media coverage can cause CEOs embarrassment (Skeel, 2001), damage their reputation and prompt them to adopt strategic changes (Bednar et al., 2013; Liu and McConnell, 2013). Bednar et al. (2013) explain that firms and executives who receive more attention are less likely to be satisfied with the current state of the firm and prefer to engage in significant change in strategy by modifying resource allocation.

We focus on two investment mechanisms through which media sentiment affects firm risk. Given the high degree of uncertainty relating to firms future benefits, R&D expenditures are typically viewed as high risk investments when compared to capital expenditures on property, plant, and equipment (Bhagat and Welch, 1995; Kothari et al., 2002; Coles et al., 2006; Cassell et al., 2012). We predict a positive association between media sentiment (both good and bad) and R&D expenditures because we expect that CEOs with widespread media coverage will choose more risky investment policies. In addition, prior literature has shown that a less diverse range of revenue sources means a firms' turnover is likely to be more sensitive to demand for fewer products (Sila et al., 2016). Firm risk can be reduced by increasing the diversity of the firm across many lines of business (Tufano, 1996; Coles et al., 2006; Cassell et al., 2012). Therefore, a diversified firm is exposed to less risk, and this is a consequence of the CEO receiving more media coverage. Based on the above arguments, we present our second hypothesis as follows:

H2a: There is a positive association between media sentiment (both good and bad) and R&D expenditures

H2b: There is a negative association between media sentiment (both good and bad) and diversification.

Firm risk can be reduced by holding more liquid assets or by decreasing the level of debt (Lev, 1974; Ohlson, 1980; Cassell et al., 2012). Harford et al. (2014) suggest that a firm can increase its cash holdings to reduce refinancing risk. In addition, Bhagat et al. (2015) point out that firms engage in excessive risk-taking mainly through increased leverage. We argue that firms are more likely to hold liquid assets (or to reduce financial debt) to control and reduce increased risk exposure when firms and CEOs experience greater media coverage. We expect a positive association between media sentiment and working capital (cash holding) and a negative association between media sentiment and financial leverage. Thus, we propose our third hypothesis as follows.

H3a: There is a positive association between media sentiment (both good and bad) and working capital (cash holding).

H3b: There is a negative association between media sentiment (both good and bad) and financial leverage.

3 Data and methodology

3.1 Sample selection

Our initial sample consists of S&P 500 firms from Compstat that also have data on Execucomp and the Centre for Research in Security Prices (CRSP) databases. We also obtain commonly-used measures of corporate governance quality from the RiskMetrics database. Media sentiment data are obtained from news articles in the Factiva database. We exclude the financial firm (standard industry classification code (SIC) between 6000 and 6999) and utility firms (SIC between 4900 and 4999). We consider calendar years rather than fiscal years to simplify the search. Although most of the S&P 500 firms have December year-ends, the difference between calendar and fiscal years is minimal in our sample (Francis et al., 2008). Our final sample consists of 4,565 firm-year observations that represent 364 different firms from 1996 to 2014.

3.2 Measures of media sentiment

We compute the yearly media sentiment based on the aggregated textual tone in four newspapers and one magazine: *The Wall Street Journal*, *The Washington Post, The New York Times*; *USA Today*; and *Forbes* (Core et al., 2008; Francis et al., 2008; Bednar, 2012; Bednar et al., 2013). Media coverage data are obtained from news articles in the Factiva database. We search for CEO-specific articles using both the CEO's name and firm's name. We obtain the CEOs' name and firms' name from the Excucomp and Compustat datasets and restrict our sample to observations where the CEO was in office for the whole year.[2] We consider shortened names (e.g., Dan for Daniel) and common nicknames (e.g., Chuck for Charles). Following Liu and McConnell (2013), we search for

[2] This requirement ensures that media tone from the previous year can be used to explain the riskiness of firms managed by same CEO.

the firm's formal name and its popular name.[3] In addition, we also consider firm's stock ticker symbol (e.g., IBM for International Business Machines Corporation) as a search criteria.

To process information from the relevant articles, we develop a PERL program to analyse the text of each article. Using the Loughran and McDonald (2011) financial dictionary, the program counts the number of words for different categories in a given text. The PERL program also counts the number of times a unique word appears in an article. In addition, we impose certain criteria to eliminate irrelevant articles which provide no valid information. First, we require that articles contain at least 50 words (Bednar, 2012; Bednar et al., 2013; Liu and McConnell, 2013; Liu et al., 2017). Second, articles must contain the CEO's family name and the firm's popular name more than twice. Finally, articles having irrelevant titles are not included in our sample. To identify these titles, we randomly read approximately 500 articles from the sample. We exclude some articles with contents unrelated to the firms and CEOs, such as those that provide a list or a table. For example, an article entitled "Top 100 CEOs" which reports a ranking list of CEO with the highest compensation. We further require that articles exclude combined and compounded news, such as "Business and Finance", "What's on Friday" and "Insider on Time". These articles consist of more than 10 news sections and only one of the sections relates to the firm and the CEO that are relevant to our study.

To measure the tone of articles, we count the number of positive, negative, uncertain, litigious, weak modal and strong modal words in the articles following Loughran and McDonald (2011) financial dictionary via the PERL program. We use the percentage of these categories words to total words in a given text as our media sentiment measures. Positive sentiment (Positive) is equal to the mean score for the positive words category from all articles about a particular firm in a given

3 Liu and McConnell (2013) identify the formal name of each firm which include the firm's organization type as search criteria, such as "Inc.", "Corp." or "Ltd.". Additionally, they characterize the firm's popular name by excluding its organization type.

year. Similarly, other five sentiments (Negative, Uncertain, Litigious, Weak Modal and Strong Modal) are analysed using the same approach.

3.3 Measures of the volatility of stock returns

We consider two measures to capture the volatility of future firm stock return. Our first measure is total risk which is defined as the standard deviation of daily stock returns in year t. However, the firm stock return can be driven by market fluctuations and therefore the volatility of stock return may not entirely reflect firm-specific risk (Goyal and Santa-Clara, 2003; Cassell et al., 2012). Hence, we construct our second measure, idiosyncratic risk, which is calculated as the standard deviation of the residuals from the Fama-French three-factor model regression in year t. We multiply the total and idiosyncratic risk measures tabulated from daily data by the square root of 252 to annualize them, respectively. To mitigate the concern that skewness of either measure may influence our results and inference, we take the natural logarithm of both measures.

3.4 Measures of the riskiness of firm investment and financial Policies

We adopt two measures for the riskiness of firm investment policies: (1) R&D expenditures; and (2) firm diversification. R&D expenditures (R&D/Sales) is constructed as the percentage of R&D expenditures to total sales measured at the end of year t. Diversification is measured by the entropy measure of diversification developed by (Jacquemin and Berry, 1979). Diversification equals to $\sum p_s \ln(1/p_s)$ where p_s is the proportion of the firm's total sales in segments, measured in year t (Jacquemin and Berry, 1979; Khanna and Palepu, 2000; Cassell et al., 2012). Segment date is obtained from Compustat segment dataset. The firm's sales come from one segment when the segment date are missing.

Our measures for the riskiness of financial policies focus on firm assets and debt burden in the firm's capital structure. Working capital is defined as current assets minus current liabilities scaled by total assets. Total book leverage is the ratio of total debt to total assets. Cash holding is

calculated as the fraction of cash and short-term investments to total assets. For those measures, inputs are measured in year t.

3.5 Control variables

As our empirical estimation assumes that the unobserved factors may influence media sentiment and firm risk, we follow the prior literature by including a comprehensive set of control variables. We control for the number of articles because media coverage can detect corporate financial fraud that lead a higher firm risk (Miller, 2006; Dyck et al., 2008). Drawn from previous literature (Archer and Faerber, 1966; Guay, 1999; Opler et al., 1999; Pástor and Pietro, 2003; Coles et al., 2006; Cassell et al., 2012) on determinants of firm risk, we obtain commonly-used measures of firm characteristics, including firm age (Log of firm age), total assets (Log of assets), market to book ratio (Market to book), sales growth (Sales growth), stock returns (Stock returns), market leverage (Debt to equity) and cash surplus (Cash surplus) from the Compustat and CRSP databases. We consider trading volume, calculated as the number of common shares traded in the previous year, because trading volume can predict firm idiosyncratic risk (Linsmeier et al., 2002; Brown and Kapadia, 2007).

Additionally, we consider the governance characteristics in our empirical model. We control for board size as decision made by a large board may lead to a less risky outcome (Sah and Stiglitz, 1991). We include board independence (Independence) as a control variable because the presence of independent directors can result in a more shareholder-focus board, which could lead to high risk-taking activities (Sila et al., 2016). We also control for board interlocking defined as a dummy variable that equals one if the firm has at least one director who serves on a board of another firm.

To control CEO risk-taking incentives, we collect data on CEO tenure, age and CEO cash compensation. Long-tenured CEOs are likely to be involved in more strategic risk situations and can be expected to better manipulate the firm in risk taking (Simsek, 2007). Serfling (2014) argues that older CEOs have less risk-taking behaviours and prefer less risky investment policies. We

include the natural logarithm of cash compensation because CEOs with higher cash compensation tend to diversify their wealth and make less risk averse decisions (Guay, 1999). Coles et al. (2006) find that higher sensitivity of CEO wealth to stock volatility (vega) implements riskier policy choices by controlling for CEO pay-performance sensitivity (delta) and the feedback effects of firm policy and risk on managerial compensation. Therefore, we also control for CEO vega as well as CEO delta in our model. Appendix A provides detailed definitions for each of the variables.

Descriptive statistics for all variables are presented in Table 1. The mean R&D to sales is 0.065, which is consistent with the number (i.e. 0.054) reported by Cassell et al. (2012). The average of Diversification and Working capital are consistent with Cassell et al. (2012) as well. The mean of financial leverage (total book leverage) is approximately 0.24 which is consistent with Humphery-Jenner et al. (2016). As shown in the media variables, the average media sentiment is approximately 0.272% (Strong), 0.157% (Positive), 0.978% (Negative), 0.218% (Weak), 0.368% (Uncertain) and 0.180% (Litigious). That means, on average, 0.157% of the words in the articles about the CEO and the firm demonstrate a positive sentiment in a financial context, while 0.978% of words in the articles have a negative sentiment. The summary statistics for control variables are also reported in Table 1. The average measures for Market to book is similar to that reported by Cassell et al. (2012). The mean of CEO tenure is approximately 7.2 which is consistent with the variable reported in Bebchuk et al. (2011) and Humphery-Jenner et al. (2016). The summary statistics for the CEO incentives variables show that the average CEO delta and vega are around 825.818 and 190.070, respectively, which are comparable to the ones reported in Sila et al. (2016).

< Insert Table 1 here >

Table 2 presents a matrix of estimated correlation coefficients for media sentiment measures and control variables. It is not surprising that weak modal and uncertain variables are highly correlated at 92.5% because of the existence of overlapping words in these two categories. In addition, we find that negative sentiment is highly correlated with weak modal (61.8%), uncertain (68.6%) and litigious (57.7%) sentiment variables. While the rank order correlation is slightly higher

for some variables (natural log of firm age and natural log of assets = 44.2%; number of articles and trading volume = 44.6%; natural log of assets and trading volume = 44.9%), the tabulated variance inflation factors from the empirical estimations are all below 3.4 (not reported), which indicates that multicollinearity is not a concern for the regression analysis.

< *Insert Table 2 here* >

3.5 Methodology

To test our hypothesis, we employ the regression model to examine the impact of media sentiment on the volatility of stock return as presented in equation (1) below.

$$Volatility\ of\ stock\ return_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t}, \quad (1)$$

where volatility of stock return includes two measures: (1) Log of total risk; and (2) Log of idiosyncratic risk. Our independent variables consist of Positive, Negative, Uncertain, Litigious, Weak and Strong following Loughran and McDonald (2011).

We then further examine the association between media sentiment and the riskiness of investment policies by estimating the following regression model.

$$Investment\ policies_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t}, \quad (2)$$

where the investment policies dependent variable refers to R&D expenditures and diversification (entropy) as shown in equation (2) above. In addition, we perform liner probability models to examine the effect of media sentiment on riskiness of financial policies. We utilise working capital, total book leverage and cash holding as proxies for firms' financial policies. The regression model is presented in equation (3) below.

$$Financial\ policies_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t}. \quad (3)$$

All independent and media sentiment variables are measured in the previous year. We include industry and year fixed effects to control for industry characteristics and other factors over our sample period. Standard errors are adjusted for heteroscedasticity and firm-level clustering.

4 Empirical results

Our main empirical tests are presented in this section. Media sentiment based on the order of significant level includes the six media tones in each regression. The variables of interest are Strong, Positive, Negative, Weak, Uncertain and Litigious, respectively. The control variables include number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. Each model includes year and industry fixed effects using the two-digit SIC level. All standard errors are clustered at the firm level to account for correlations within firm observations.

4.1 The impact of media sentiment on the volatility of stock return

We examine whether stock return volatility is affected by media sentiment. Stock return volatility is measured as the natural log of total risk or the natural log of idiosyncratic risk following Cassell et al. (2012). The results of the empirical tests investigating Hypothesis 1 are presented in Table 3.

Column 1 of Panel A, reports a positive, significant coefficient for the strong sentiment estimation (0.066, $p<0.01$). After controlling for other factors, a firm where the CEO achieves strong media sentiment and holds office for at least two consecutive years is associated with higher total firm risk. Column 2 reports a marginally significant relationship between positive sentiment and total risk. In column 3, there is a significant positive association (0.031, $p<0.01$) between negative sentiment and total firm risk. CEOs with more negative media sentiment are associated with firms that operate with higher risk. Similarly, the coefficients for Weak (0.076, $p<0.01$) and Uncertain (0.052, $p<0.01$) sentiment reported in Columns 4 and 5 are both positive and significant,

respectively. These media sentiments reflect uncertainty in the market and that generates greater firm risk.[4] There is no evidence of a relation between litigious sentiment and firm total risk as shown in Column 6. In the case of litigious sentiment, the firm or CEO has already reached a point where the legal impacts of decisions made have occurred so the risk is already fully known. As such, there is no further exposure or risk-seeking behaviour that the CEO can adopt to try and counter the effect that this information has on the firm.

Panel B of Table 3 presents the results for Model (1) estimated with the log of idiosyncratic risk measured in year t, as the dependent variable. The coefficient for Strong sentiment, reported in Column 1, is negative and statistically significant (0.078, $p<0.01$). Positive sentiment is also associated with idiosyncratic risk (0.048, $p<0.05$). The results are consistent with the results in Panel A. Additionally, the significant, positive coefficients in Columns 3-5 of Panel B, excluding Litigious, are related to firm idiosyncratic risk. The results suggest that a large range of media sentiment is positively associated with firm risk-taking. Litigious sentiment is not related to firm risk as shown by the insignificant coefficient reported in Column 6.

Overall, the results reported in Table 3 are largely consistent with Hypothesis 1. The findings suggest that there is a positive association between media sentiment and stock return volatility. To the extent that the media sensationalizes articles about the CEO and the firm, our results argue that media sentiment (i.e. strong modal and positive sentiments) act as an outside signal to reflect that the CEO is overconfident and hubris, possibly overestimating returns to investment and underestimating risks (Dittrich et al., 2005; Malmendier and Tate, 2005). The finding also implies that firms where CEOs attract greater negative media sentiment are associated with greater firm risk, damaging firm value. Finally, more uncertainty and weak media sentiment is associated with greater firm risk.

< Insert Table 3 here >

[4] Weak sentiment is highly correlated with uncertain sentiment. Uncertain category contains a larger number of weak modal words, such as "may", "perhaps" and "probable".

4.2 The impact of media sentiment on the riskiness of investment policies

We further examine the relation between media sentiment and the riskiness of investment policies. The riskiness of investment policies is measured by R&D expenditures and diversification (entropy). The results of the empirical estimations performed to investigate Hypothesis 2 are presented in Table 4.

Panel A of Table 4 reports equation (2) estimated using R&D expenditures as the dependent variable. The Strong sentiment model reported in Column 1 shows a positive and marginally significant association to R&D spending (0.022, $p<0.10$). Strong media sentiment is associated with greater R&D spending. Both Positive (0.13, $p<0.05$) and Negative (0.008, $p<0.05$) media sentiment are associated with more R&D spending as reported in Columns 2 and 3. The larger magnitude of the positive sentiment coefficient suggests that firms spend more on R&D following positive rather than negative sentiment. There is a marginal positive association between Uncertain media sentiment (0.025, $p<0.10$) as shown in Column 5. However, Weak and Litigious sentiment are not associated with R&D investment. The results are consistent with Hypothesis 2a, confirming a positive association between media sentiment (excluding Weak and Litigious) and R&D expenditures. There is no evidence of a relation between media sentiment and diversification (entropy). The results suggest that media sentiment is associated with greater R&D spending but cannot explain firm diversification activities.

The estimations reported in Panel B of Table 4 show the results for model (2) using diversification (entropy) as the dependent variable. Each of the coefficients for Strong, Positive, Weak and Uncertain media sentiments, reported in Columns 1, 2, 4 and 5 are negative and insignificant. Weak and Litigious sentiment, reported in Columns 3 and 6 are also not related to firm diversification. The results are not consistent with Hypothesis 2a and show no evidence of an association between media sentiment and diversification.

< Insert Table 4 here >

4.3 The impact of media sentiment on the riskiness of financial policies

Table 5 reports the models used to test Hypothesis 3. The models estimate financial policy as a function of media sentiment by examining the effect of media sentiment in the prior year on working capital, total leverage and cash holdings. The financial policies variables are measured at year t.

Panel A presents the results of pooled panel regression estimated using working capital. There is a significant, positive association (0.009, $p<0.05$) between negative sentiment and the level of working capital as reported in Column 3. More negative sentiment associated with a CEO in a firm for at least two years is associated with more working capital. The marginal significance of weak sentiment (0.028, $p<0.10$) reported in Column 4 is also consistent with increases in working capital in the subsequent year. The coefficients on other media sentiment reported in Columns 1, 2, 5 and 6 have no association with the level of a firm's working capital.

Panel B of Table 5 reports the models testing the association between media sentiment and total book leverage. Only the coefficient for Positive sentiment reported in Column 2 is negative and statistically significant, (-0.022, $p<0.05$). Firms with CEOs that attract more positive media sentiment experience lower levels of book leverage compared to those that do not. Hence, positive media sentiment is associated with lower leverage.

Panel C of Table 5 reports the results for model (3) estimated with cash to assets as the dependent variables. Columns 1, 3, 4 and 5 all report a significant, positive relation between Strong, Negative, Weak and Uncertain media sentiment and the ratio of cash to assets. The association is marginally significant for Positive sentiment (0.015, $p<0.1$) as shown in Column 2. Consistent with Acharya et al. (2012), the result suggests that firms that demonstrate a riskier sentiment hold higher cash reserves. To hedge greater risk exposure as measured by media sentiment, firms that experience Strong, Negative, Weak and Uncertain modes of exposure prefer to hold more liquid assets which leads firms to spend substantially less on investment or acquisitions (Opler et al., 1999).

< Insert Table 5 here >

5 Robustness

5.1 Alternative media sentiment estimation

We create alternative media sentiment measures based on Loughran and McDonald (2011) financial dictionary by reclassifying the six original sentiment categories into two broader groups, referred to as the 'good news' and the 'bad news'. Each news group excludes any previous duplication of words.[5] Good news group (Good) aggregates strong and positive sentiments. Articles that demonstrate a strong sentiment imply firm stability. Positive sentiment reflects positive media news about the CEO. A good news environment is more likely to help the firm to build a better public image and reputation. Bad news group (Bad1) aggregates weak and negative sentiments. Weak sentiment includes words associated with uncertainty that increase article ambiguity. Weak modal is also the opposite of strong modal. Negative coverage may influence firms' outcomes by reducing firm performance and changing firm decisions (Dyck et al., 2008; Gurun and Butler, 2012; Bednar et al., 2013; Liu and McConnell, 2013). A second Bad news group (Bad2) is also formed by aggregating the Weak, Negative, Uncertain and Litigious sentiments. Uncertain is highly correlated to Weak sentiment and implies uncertainty and invisibility in news reports. Litigious sentiment refers to punishment and illegal behaviour of firms and CEOs. Consequently, we argue that Uncertain and Litigious sentiments should be a part of bad news group.

Table 6 shows the panel data regression for the association between alternative media sentiment and the volatility of stock return. Columns 1 and 4 report a positive and statistically significant coefficient for Good variable is (0.037, $p<0.01$ and 0.044, $p<0.01$, respectively). The significance

[5] We construct the two broader groups using the original classification by Loughran and McDonald (2011) that words could be used to form different sentiment categories more than once. For example, "probable" is contained by uncertain category but also belongs to weak modal category. Thus, we exclude duplication of words in each broader group.

of the Good variable is consistent with Hypothesis 1a and suggests that 'good' media sentiment is associated with greater stock return volatility. Bad1 variable reports a positive, significant coefficient in Columns 2 and 5 (0.026, p<0.01 and 0.030, p<0.01, respectively). The estimation is repeated using the alternative measure (i.e. Bad2 variable) and we find similar findings as reported in Columns 3 and 6 (0.019, p<0.01 and 0.022, p<0.01). Greater 'bad' media sentiment as proxied by Bad2 variable is associated with higher total and idiosyncratic firm risk. The result is consistent with Hypothesis 1b. There is a positive relationship between negative media sentiment and the stock return volatility.

< Insert Table 6 here >

Table 7 presents estimation results for hypothesis 2 that examines the relation between alternative media sentiment and the riskiness of investment policies. Columns 1, 2 and 3 all report positive, significant Good (0.013, p<0.05), Bad1 (0.007, p<0.05) and Bad2 (0.006, p<0.05) coefficients, respectively. Greater 'good' and 'bad' media sentiment leads to more risky, higher R&D expenditures. The results in Columns 4, 5 and 6 show no association between diversification strategy and media sentiment. These results are consistent with the findings reported in Table 4 and provide further support to our Hypothesis 2a.

< Insert Table 7 here >

Table 8 reports the models estimated to examine the relation between alternative media sentiment and the riskiness of financial policies. While Good variable is not related to working capital, Bad1 and Bad2 variables reported in Columns 2 and 3 both show a positive, significant association with the level of a firm's working capital (0.008, p<0.05 and 0.006, p<0.05, respectively). These results imply that Bad variable acts as a mechanism to signal increases in working capital. Firms may increase liquid assets and reduce liquid liabilities to deal with the increasing levels of firm risk. The results in Columns 4, 5 and 6 show no evidence of a relationship between media sentiment and total book leverage. Finally, the coefficients reported in Columns 7, 8 and 9, all demonstrate a positive, significant association between Good (0.015, p<0.01), Bad1

(0.009, p<0.01) and Bad2 (0.006, p<0.01) measures of media sentiment and cash held by the firm. This result is consistent with Hypothesis 3a.

Taken together these results confirm that media sentiment is positively related to the volatility of future firm stock returns, R&D expenditures and cash holdings. In addition, there is a positive association between negative sentiment and working capital.

< Insert Table 8 here >

5.2 Endogeneity

The methodology used for the analysis may be affected by the potential endogenous relation between the level of firm risk and the measures of media sentiment. To address this concern, an instrumental variable approach is used to examine the relationships using a 2SLS framework. Herman and Chomsky (2010) suggest that the media caters to advertisers. Positive media slant has a strong, positive relation to companies' advertising budgets (Gurun and Butler, 2012). Media, particularly local newspapers, generate a large proportion of revenue through advertising. Thus, media is related to advertising expenditure. To address the endogeneity concerns, the models are estimated using the ratio of advertising expenditure to total assets (Advertising/Assets) as the instrumental variable. We find that the instrumental variable is not correlated with the volatility of stock return or the riskiness of investment and financial policies.

Panel A of Table 9 reports the first-stage results for the ratio of advertising expenditure to total assets as our instrument variable. The coefficient on Advertising/Assets variable is positive and statistically significant (p≥0.05) in Columns 1, 2, 4 and 5. These results are largely consistent with Gurun and Butler (2012) that the media is more likely to report firms' news, particularly positive coverage, when advertising expenditures of those firms is larger. The regression coefficients on Negative and Litigious sentiment are not significant as shown in Columns 3 and 6. One potential explanation is that firms may want to reduce or avoid the existence of Negative and Litigious coverage by increasing advertising expenditure and improving firm reputation.

Panel B of Table 9 reports the results for the second-stage regression with the natural log of total risk and the natural log of idiosyncratic risk are the dependent variables. All the media sentiment coefficients, excluding Litigious, are positive and statistically significant. These results support Hypothesis 1a and 1b. Greater media sentiment, regardless of its nature exposes the firm to more total and idiosyncratic risk. Panel C of Table 9 reports the second-stage regression for the models with riskiness of investment policy (R&D expenditures and diversification) as the dependent variable. Columns 1, 2, 3 and 5 report positive, significant media sentiment coefficients for Strong, Positive, Negative and Uncertain, respectively. There is no strong association between media sentiment and diversification. The results support Hypothesis 2a and are consistent with the models estimated in Table 4. The second-stage regression analysis of riskiness of financial policies (working capital, total book leverage and cash holdings) are reported in Panel D of Table 9. Columns 3 and 4 reports positive, significant coefficient for Negative (0.0090, $p<0.05$) and Weak (0.028, $p<0.10$) media sentiment. Columns 13 to 17 all report positive, significant associations between media sentiment and cash holdings. The result is consistent with that reported in Table 5 and suggests that firms retain higher liquid assets when expose to higher positive and negative media sentiments. Column 8 shows that the coefficient on Positive variable is negative and statistically significant (-0.022, $p<0.05$). This provides some support to Hypothesis 3b, that positive media sentiment can reduce firm financial leverage budgets. However, none of the other results show the relevance of media sentiments in influencing the level of financial leverage. Overall, our findings are robust to endogeneity concerns.

< Insert Table 9 here >

5.3 Alternative measures over time t to $t + 2$

Another potential concern with our empirical analysis is the effect of media sentiment on firm risk and policies over a longer time horizon. We conduct an additional analysis in an attempt to examine the potential influence of media sentiment. We construct our dependent variables

(including the volatility of stock return and the riskiness of investment and financial measures) by calculating the average of these variables for the three-year period, measured in year t to year $t+2$.

Panel A of Table 10 reports positive, significant coefficients that show media sentiment to be highly associated with total firm risk and firm idiosyncratic risk. The regression coefficient on the Litigious variable is positive but not significant in Column 6, but it is significant (0.033, $p<0.1$) in Column 12. Panel B of Table 10 reports the association between media sentiment and R&D expenditure (diversification). The coefficient in Columns 1, 2, 3 and 5 are all positive and statistically significant at 5% level or above. Excluding negative sentiment in Column 9 (0.024, $p<0.10$), there is no relation between media sentiment and diversification. Panel C of Table 10 reports the estimated 2SLS models for the riskiness of financial policies. Columns 3 and 4 report positive, significant coefficients for Negative (0.011, $p<0.05$) and Weak (0.030, $p<0.10$) media sentiment. Media sentiment, excluding Strong and Litigious sentiments, is positively related to cash holdings as reported in Columns 14 to 17. The coefficient on media sentiment are not related to total book leverage as reported in Columns 7 to 12. Collectively, these findings are consistent with our main results presented in Tables 3, 4 and 5 and provide further support that media sentiment is strongly related to firm risk, investment and financial policies.

< Insert Table 10 here >

6 Conclusion

Despite a great deal of attention in the prior literature on the influence of media on firms' outcomes and CEO behaviour (Dyck et al., 2008; Bushee et al., 2010; Bednar, 2012; Gurun and Butler, 2012; Liu and McConnell, 2013; Liu et al., 2017), there is limited empirical evidence on the effect of media sentiment on firm's risk, corporate investment, and financial policies. In this paper, we examine whether CEOs with positive and negative media sentiments manage firm differently in terms of the risk-taking activities, the level of corporate investment, and financial policies.

We find that CEOs who are exposed to both positive and negative media sentiments tend to be associated with firms that experience subsequent higher stock return volatility. The analysis highlights the effect of the media's news dissemination role in the prediction of firm risk. Furthermore, we show that media sentiment (excluding Weak and Litigious) is positively related to firms' R&D expenditures. This suggests that firms implement risky investment policies when exposed to positive and negative media coverage.

All the media sentiment modes, excluding Litigious, are positively associated firm risk and R&D expenditures. We attribute such results to CEOs being overconfident in overestimating returns to investment and underestimating risks when the measure of sentiment (Strong and Positive) in articles is higher. Additionally, we argue that the CEOs that are exposed to widespread bad news group sentiment (Negative, Weak, Uncertain and Litigious) prefer to adopt risk-seeking behaviour in an attempt to gain more personal wealth and to try and salvage firm reputation.

We also provide empirical evidence that media sentiment is strongly related to the liquidity of the firm's assets (cash holdings). Firms are more likely to add liquid assets to control and reduce increased firm exposure when firms and CEOs faced increased media coverage (i.e. both positive and negative media sentiments). This finding implies that the CEO who received both positive and negative media coverage is more likely to increase cash flow to maintain a safety net or to hedge risk.

We show that there is no significant association between Litigious sentiment and stock return volatility or the riskiness of firm investment and financial policies. One potential explanation is that for Litigious sentiment in press reporting, the firm is more likely to train a new successor to replace the existing CEO and to even fire the CEO immediately if the CEO experiences a large amount of litigious media coverage.

Finally, we create an alternative media sentiment measures derived from Loughran and McDonald (2011) to investigate the association between alternative media sentiment and firm risk and the riskiness of investment and financial policies. In addition, another potential concern is that

the media sentiment variable may be endogenous. In order to alleviate this concern, we adopt a 2SLS regression approach where we utilise the ratio of advertising expenditure to total assets as our instrumental variable. We also perform additional analyses on the effect of media sentiment on firm risk and policies for longer time horizons. The overall results are robust and provide further support to our main findings and conjectured hypotheses that media sentiment (both good and bad news) to be positively associated with the volatility of future firm stock returns, R&D expenditures, and the extent of cash holding. Moreover, our findings provide support on the influence of media sentiment as an external mechanism in explaining the level of firm risk, corporate investment, and financial policies.

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Appendix A: Variable definitions

Dependent variables	
Log of total risk	The natural logarithm of the variance of daily returns in year t.
Log of idiosyncratic risk	The natural logarithm of the standard deviation of the residuals from Fama-French three factors model in year t.
R&D to sales	The ratio of research and development expenditures to total assets in year t.
Diversification (entropy)	Equals to $\sum p_s \ln(1/p_s)$ where p_s is the proportion of the firm's total sales in segments
Working capital	Current assets minus current liabilities and then scaled by total assets. When the value is not available, the measure is calculated as the sum of cash and short-term investments, other current assets, inventory and current accounts receivable, minus the sum of accounts payable, other current liabilities, debt in current liabilities and income tax payable, and then scaled by total assets
Total book leverage	The total debt divided by total assets.
Cash to assets	The cash flow divided by assets.
Media sentiment	
Strong	The percentage of both strong modal words to total words.
Positive	The percentage of both positive words to total words.
Negative	The percentage of both negative words to total words.
Weak	The percentage of both weak modal words to total words.
Uncertain	The percentage of both uncertain words to total words.
Litigious	The percentage of both litigious words to total words.
Good	The percentage of both strong modal and positive words to total words.
Bad1	The percentage of both weak modal and negative words to total words.
Bad2	The percentage of both weak modal, negative, uncertain and litigious words to total words.
Control variables	
Number of articles	The number of articles for each firm in a given year.
Log of firm age	The natural logarithm of firm age.
Log of assets	The natural logarithm of total assets.
Market to book	The ratio of the market value of equity to the book value of assets.
Sales growth	The percentage of total sales in year t to that in year $t-1$.
Stock return	The firm's stock return over the prior year.
Debt to equity	The ratio of total debt to market value of equity.
Cash surplus	Net cash flow from operating less depreciation and amortization plus research and development expenditure divided by the book value of total assets.
Trading volume	The number of common shares traded
Board size	The number of directors
Board interlock	A dummy variable equals to one if the firm has at least one director who serves on board of another firm, zero otherwise
Independence	The percentage of outsider directors sitting on the board of directors.
CEO tenure	Number of years the CEO is in office.
Log of CEO age	The natural logarithm of CEO age.
Log of cash compensation	The natural logarithm of salary and bonus.
CEO delta	The dollar change in compensation per 1% increase in stock return.
CEO vega	The dollar change in compensation per 1% increase in a firm's standard deviation of stock return.
Instrumental variable	
Advertising/assets	The ratio of advertising expenditures to total assets.

Table 1 Descriptive statistics

This table reports the number of observations, the mean, median, standard deviation, minimum and maximum observations for each variable in the sample. The sample contains 4,565 firm-year observations for 364 different firms in ExecuComp from 1996 to 2014. Definitions for all variables are provided in Appendix A.

Variables	Obs.	Mean	Median	Std. Dev.	Min	Max
Log of total risk	4552	-1.140	-1.164	0.422	-2.246	0.390
Log of idiosyncratic risk	4552	-1.300	-1.325	0.437	-2.378	0.331
R&D to sales	4179	0.065	0.021	0.180	0.000	5.682
Diversification	4552	0.531	0.385	0.481	0.000	2.568
Working capital	4549	0.162	0.132	0.185	-0.477	0.934
Total book leverage	4552	0.239	0.223	0.170	0.000	1.562
Cash holding	4518	0.130	0.075	0.148	0.000	0.946
Strong (%)	4,352	0.272	0.246	0.303	0.000	3.650
Positive (%)	4,352	0.157	0.007	0.374	0.000	3.042
Negative (%)	4,352	0.978	0.966	0.950	0.000	7.099
Weak (%)	4,352	0.218	0.209	0.226	0.000	1.870
Uncertain (%)	4,352	0.368	0.389	0.352	0.000	2.270
Litigious (%)	4,352	0.180	0.041	0.347	0.000	5.049
Number of articles	4,352	7.059	1.000	20.828	0.000	367.000
Log of firm age	4,338	3.292	3.447	0.688	0.651	4.165
Log of assets	4,340	8.889	8.829	1.350	4.343	13.590
Market to book	4,338	2.490	1.957	2.364	0.718	78.765
Sales growth	4,340	1.157	1.086	0.938	0.218	46.239
Stock return	4,340	0.532	0.153	1.938	-0.632	10.497
Debt to equity	4,338	0.339	0.158	1.356	0.000	54.525
Cash surplus	3,968	0.121	0.104	0.091	-0.912	0.966
Trading volume (million)	4,336	1.049	0.460	1.967	0.006	29.609
Board size	4,304	10.361	10.000	2.186	4.000	19.000
Interlock	4,304	0.056	0.000	0.254	0.000	3.000
Independence (%)	4,352	59.750	72.727	32.784	0.000	94.737
CEO tenure	4,352	7.203	5.417	6.298	1.000	51.000
Log of CEO age	4,301	4.013	4.025	0.119	3.296	4.419
Log of cash compensation	4,344	7.634	7.676	0.831	-4.605	11.264
CEO delta	4,352	825.818	308.138	2,739.390	0.000	72,877.620
CEO vega	4,352	190.070	74.678	320.593	0.000	4307.604

Table 2 Correlation

This table reports the correlation coefficients for the independent variables used in this study. The table reports the Pearson correlation coefficients for media sentiment and control variables. Definitions for all variables are provided in Appendix A.

	Variables	1	2	3	4	5	6	7	8	9	10	11	12
1	Strong	1.000											
2	Positive	0.174	1.000										
3	Negative	0.447	0.222	1.000									
4	Weak	0.490	0.218	0.618	1.000								
5	Uncertain	0.541	0.250	0.686	0.925	1.000							
6	Litigious	0.234	0.057	0.577	0.332	0.361	1.000						
7	Number of articles	0.192	0.063	0.236	0.252	0.250	0.159	1.000					
8	Log of firm age	0.056	0.124	0.157	0.060	0.078	0.059	0.059	1.000				
9	Log of assets	0.230	0.230	0.365	0.312	0.334	0.215	0.376	0.442	1.000			
10	Market to book	0.016	-0.045	-0.068	0.006	-0.006	-0.016	0.021	-0.236	-0.267	1.000		
11	Sales growth	0.002	-0.022	-0.037	0.011	0.006	-0.013	-0.008	-0.131	-0.103	0.211	1.000	
12	Stock return	0.024	-0.038	0.015	0.008	-0.002	0.023	0.094	0.019	0.054	-0.047	-0.016	1.000
13	Debt to equity	0.041	-0.013	0.094	0.062	0.056	0.045	0.206	0.060	0.145	-0.103	-0.020	0.164
14	Cash surplus	-0.006	0.000	-0.017	0.015	0.022	0.006	0.005	-0.136	-0.172	0.346	-0.061	-0.079
15	Trading volume	0.167	0.112	0.226	0.209	0.224	0.129	0.446	0.064	0.449	0.025	-0.023	-0.027
16	Board size	0.101	0.068	0.145	0.122	0.137	0.074	0.117	0.330	0.444	-0.172	-0.036	0.020
17	Board interlock	-0.021	-0.081	-0.031	-0.013	-0.029	-0.007	-0.003	-0.013	-0.037	0.035	0.003	0.006
18	Independence	0.004	0.195	0.091	0.030	0.045	0.025	0.002	0.273	0.194	-0.083	-0.089	-0.253
19	CEO tenure	-0.045	0.019	-0.045	0.006	-0.006	-0.012	-0.015	-0.071	-0.070	0.030	0.014	0.013
20	Log of CEO age	-0.040	0.042	-0.020	-0.012	-0.022	-0.015	-0.085	0.139	0.165	-0.139	-0.055	-0.002
21	Log of cash compensation	0.106	0.217	0.182	0.163	0.175	0.109	0.127	0.343	0.543	-0.192	-0.104	-0.051
22	CEO delta	0.061	0.091	0.067	0.086	0.078	0.064	0.051	0.029	0.137	0.038	-0.015	-0.051
23	CEO vega	0.126	0.039	0.175	0.173	0.180	0.097	0.160	0.164	0.372	-0.003	-0.033	-0.092

(Continued)

	Variables	13	14	15	16	17	18	19	20	21	22	23
13	Debt to equity	1.000										
14	Cash surplus	-0.178	1.000									
15	Trading volume	0.093	0.137	1.000								
16	Board size	0.065	-0.203	0.127	1.000							
17	Board interlock	-0.007	-0.036	-0.061	0.116	1.000						
18	Independence	-0.064	0.059	0.081	-0.003	-0.132	1.000					
19	CEO tenure	-0.038	0.040	0.029	-0.057	0.042	-0.075	1.000				
20	Log of CEO age	0.037	-0.092	-0.004	0.134	0.048	0.028	0.334	1.000			
21	Log of cash compensation	0.022	-0.042	0.178	0.266	-0.051	0.178	0.038	0.167	1.000		
22	CEO delta	-0.026	0.016	0.091	0.099	-0.009	-0.003	0.242	0.158	0.186	1.000	
23	CEO vega	-0.022	0.043	0.247	0.242	0.027	0.083	0.031	0.096	0.302	0.202	1.000

Table 3 Media sentiment and volatility of stock return

The table reports panel data regression results. In Panel A, the dependent variable is the natural log of total risk. In Panel B, the dependent variable is the natural log of idiosyncratic risk. The table reports the panel regression estimations between media sentiment and volatility of stock return for the model given by:

$$Volatility\ of\ stock\ return_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t},$$

where media sentiment includes Strong, Positive, Negative, Weak, Uncertain and Litigious. Control variables include number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. The models are fitted using industry (the two-digit SIC) and year fixed effects based on robust standard errors clustered at the firm level. The sample is constructed as described in Table 1 and variables definitions are provided in Appendix A. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Panel A: Log of total risk

Variables	Log of total risk$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strong	0.066***					
	(3.725)					
Positive		0.028*				
		(1.677)				
Negative			0.031***			
			(4.556)			
Weak				0.076***		
				(3.157)		
Uncertain					0.052***	
					(3.148)	
Litigious						0.018
						(1.176)
Observations	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.679	0.678	0.681	0.679	0.679	0.678
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Panel B: Log of idiosyncratic risk

Variables	Log of idiosyncratic risk$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strong	0.078***					
	(4.062)					
Positive		0.048**				
		(2.424)				
Negative			0.033***			
			(4.490)			
Weak				0.100***		
				(4.019)		
Uncertain					0.067***	
					(3.844)	
Litigious						0.026

						(1.503)
Observations	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.660	0.658	0.662	0.660	0.660	0.658
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Table 4 Media sentiment and the riskiness of investment policies

The table reports the panel data regression models for the riskiness of firm investment strategies. Panel A contains the models estimated using R&D expenditures as the dependent variable. Panel B shows the estimated models using Diversification (entropy) as the dependent variable. The estimated model is given by:

$$Investment\ policies_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t},$$

where media sentiment includes Strong, Positive, Negative, Weak, Uncertain and Litigious. Control variables includes number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. The models are fitted using industry (the two-digit SIC) and year fixed effects based on robust standard errors clustered at the firm level. The sample is constructed as described in Table 1 and variables definitions are provided in Appendix A. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Panel A: R&D expenditure

Variables	R&D to sales$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strong	0.022*					
	(1.933)					
Positive		0.013**				
		(2.127)				
Negative			0.008**			
			(2.048)			
Weak				0.037		
				(1.448)		
Uncertain					0.025*	
					(1.824)	
Litigious						0.000
						(0.072)
Observations	3,889	3,889	3,889	3,889	3,889	3,889
R-squared	0.211	0.210	0.211	0.211	0.211	0.210
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Panel B: Diversification

Variables	Diversification$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strong	-0.019					
	(-0.867)					
Positive		-0.008				
		(-0.282)				
Negative			0.018			
			(1.533)			
Weak				-0.024		
				(-0.688)		
Uncertain					-0.007	
					(-0.287)	

Litigious						0.027
						(0.895)
Observations	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.436	0.436	0.437	0.436	0.436	0.436
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Table 5 Media sentiment and the riskiness of financial policies

The table reports the panel data regression results of financial policies versus media sentiment. The dependent variables are Working capital, total book leverage and cash to assets, reported in Panels A, B, and C, respectively. The estimated model is given by:

$$Financial\ policies_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t},$$

where media sentiment includes Strong, Positive, Negative, Weak, Uncertain and Litigious. Control variables includes number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. The models are fitted using industry (the two-digit SIC) and year fixed effects based on robust standard errors clustered at the firm level. The sample is constructed as described in Table 1 and variables definitions are provided in Appendix A. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Panel A: Working capital

Variables	Working capital$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strong	0.003					
	(0.264)					
Positive		0.009				
		(0.998)				
Negative			0.009**			
			(2.195)			
Weak				0.028*		
				(1.763)		
Uncertainty					0.015	
					(1.410)	
Litigious						0.013
						(1.165)
Observations	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.490	0.490	0.492	0.491	0.491	0.491
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Panel B: Total book leverage

Variables	Total book leverage$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strong modal	-0.001					
	(-0.147)					
Positive		-0.022**				
		(-2.424)				
Negative			0.004			
			(0.852)			
Weak modal				-0.006		
				(-0.408)		
Uncertainty					-0.002	
					(-0.184)	
Litigious						0.001

						(0.106)
Observations	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.319	0.320	0.319	0.319	0.319	0.319
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Panel C: Cash holding

Variables	Cash to $assets_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
Strong modal	0.019**					
	(2.074)					
Positive		0.015*				
		(1.859)				
Negative			0.009***			
			(3.008)			
Weak modal				0.043***		
				(2.668)		
Uncertainty					0.027***	
					(2.666)	
Litigious						0.005
						(0.729)
Observations	4,210	4,210	4,210	4,210	4,210	4,210
R-squared	0.475	0.475	0.476	0.477	0.477	0.474
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Table 6 Alternative media sentiment and stock return volatility

The table reports the panel regression models to test the relation between alternative measures of media sentiment and stock return volatility. The models are estimated using the natural log of total risk as the dependent variable in Columns 1-3 and the natural log of idiosyncratic risk in Columns 4-6. The model used to estimation the relationship is given by:

$$Volatility\ of\ stock\ return_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t},$$

where media sentiment includes Good, Bad1 and Bad2 variables. Control variables includes number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. The models are fitted using industry (the two-digit SIC) and year fixed effects based on robust standard errors clustered at the firm level. The sample is constructed as described in Table 1 and variables definitions are provided in Appendix A. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Variables	Log of total risk$_t$			Log of idiosyncratic risk$_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
Good	0.037***			0.044***		
	(4.435)			(4.772)		
Bad1		0.026***			0.030***	
		(4.566)			(4.630)	
Bad2			0.019***			0.022***
			(4.070)			(4.244)
Observations	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.680	0.681	0.680	0.662	0.662	0.661
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Table 7 Alternative media sentiment and the riskiness of investment policies

The table reports panel data regression models to estimate the relation between the alternative media sentiment measures and investment policies. The dependent variable is R&D expenditures for the models reported in Column 1-3. The dependent variable is Diversification (entropy) for the models reported in Columns 4-6. The used to estimate the relation between media sentiment and investment policies is given by:

$$Investment\ policies_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t},$$

where media sentiment includes Good, Bad1 and Bad2 variables. Control variables includes number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. The models are fitted using industry (the two-digit SIC) and year fixed effects based on robust standard errors clustered at the firm level. The sample is constructed as described in Table 1 and variables definitions are provided in Appendix A. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Variables	R&D to sales$_t$			Diversification$_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
Good	0.013**			-0.001		
	(2.105)			(-0.054)		
Bad1		0.007**			0.013	
		(2.221)			(1.242)	
Bad2			0.006**			0.009
			(2.175)			(1.094)
Observations	3,889	3,889	3,889	3,900	3,900	3,900
R-squared	0.212	0.211	0.211	0.436	0.436	0.436
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Table 8 Alternative media sentiment and the riskiness of financial policies

This table reports the panel regression models used to estimate the relation between media sentiment and investment policies. Columns 1-3 report the models estimated with Working capital as the dependent variable. Columns 4-6 report the models estimated with Total book leverage as the dependent variable. Columns 7-9 report the models estimated with Cash to assets as the dependent variable. The equation used to estimate the relation is given by:

$$Financial\ policies_{i,t} = \alpha + \beta' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t},$$

where media sentiment includes Good, Bad1 and Bad2 variables. Control variables includes number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, log of CEO age, log of cash compensation, CEO delta and CEO vega. The models are fitted using industry (the two-digit SIC) and year fixed effects based on robust standard errors clustered at the firm level. The sample is constructed as described in Table 1 and variables definitions are provided in Appendix A. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Variables	Working capital$_t$			Total book leverage$_t$			Cash to assets$_t$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Good	0.007			-0.002			0.015***		
	(1.290)			(-0.337)			(3.152)		
Bad1		0.008**			0.003			0.009***	
		(2.236)			(0.761)			(3.142)	
Bad2			0.006**			0.002			0.006***
			(2.031)			(0.558)			(2.990)
Observations	3,900	3,900	3,900	3,900	3,900	3,900	4,210	4,210	4,210
R-squared	0.491	0.492	0.492	0.286	0.286	0.286	0.478	0.477	0.477
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 9 Instrumental variable estimations

This table reports the panel regression results for the 2SLS estimation of the relation between media sentiment and firm risk. . Panel A reports the results of the first-stage panel regression where media sentiment measured as Strong, Positive, Negative, Weak, Uncertain and Litigious are the dependent variables. The equation used to estimate the relation is given by:

$$Media\ sentiment_{i,t-1} = \alpha_0 + \alpha_1\ Ratio\ of\ advertsiting\ to\ assets_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t-1}.$$

Panel B reports the second-stage of the 2SLS regression using the predicted media sentiments in Panels B, C and D. The equation used to estimate the model is given by:

$$Volatility\ of\ stock\ return_{i,t}\ or\ Investment\ (Financial)\ policies_{i,t} = \beta_0 + \beta_1' Media\ sentiment_{i,t-1} + \gamma' Control\ variables_{i,t-1} + \varepsilon_{i,t}.$$

Control variables includes number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. The models are fitted using industry (the two-digit SIC) and year fixed effects based on robust standard errors clustered at the firm level. The sample is constructed as described in Table 1 and variables definitions are provided in Appendix A. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Panel A: First-stage regression

Variables	Strong	Positive	Negative	Weak	Uncertain	Litigious
	(1)	(2)	(3)	(4)	(5)	(6)
Advertising/Assets	0.373**	0.309**	0.435	0.240**	0.379*	-0.187
	(2.096)	(2.326)	(0.966)	(1.983)	(1.960)	(-1.098)
Observations	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.125	0.507	0.218	0.173	0.188	0.119
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES

Panel B: Second-stage regression (Volatility of stock return)												
Variables	Log of total risk$_t$						Log of idiosyncratic risk$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Strong modal	0.067***						0.078***					
	(3.795)						(4.111)					
Positive		0.029*						0.049**				
		(1.740)						(2.467)				
Negative			0.031***						0.034***			
			(4.570)						(4.497)			
Weak modal				0.077***						0.101***		
				(3.203)						(4.051)		
Uncertainty					0.053***						0.068***	
					(3.197)						(3.876)	
Litigious						0.018						0.025
						(1.151)						(1.491)
Observations	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.679	0.678	0.681	0.679	0.679	0.678	0.660	0.659	0.662	0.660	0.660	0.658
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Panel C: Second-stage regression (Investment policies)												
Variables	R&D to sales$_t$						Diversification$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Strong modal	0.025**						-0.020					
	(2.064)						(-0.884)					
Positive		0.016**						-0.008				
		(2.327)						(-0.301)				
Negative			0.008**						0.018			
			(2.093)						(1.522)			
Weak modal				0.041						-0.025		
				(1.570)						(-0.703)		
Uncertainty					0.027*						-0.007	
					(1.963)						(-0.303)	
Litigious						-0.001						0.027
						(-0.093)						(0.905)
Observations	3,889	3,889	3,889	3,889	3,889	3,889	3,900	3,900	3,900	3,900	3,900	3,900
R-squared	0.211	0.210	0.211	0.212	0.212	0.210	0.436	0.436	0.437	0.436	0.436	0.436
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Panel D: Second-stage regression (Financial policies)

Variables	Working capital$_t$						Total book leverage$_t$						Cash to assets$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Strong modal	0.002						-0.001						0.020**					
	(0.225)						(-0.140)						(2.038)					
Positive		0.009						-0.022**						0.014*				
		(0.961)						(-2.327)						(1.678)				
Negative			0.009**						0.004						0.009***			
			(2.178)						(0.818)						(2.805)			
Weak modal				0.028*						-0.006						0.040**		
				(1.716)						(-0.398)						(2.283)		
Uncertainty					0.015						-0.002						0.025**	
					(1.369)						(-0.178)						(2.232)	
Litigious						0.013						0.001						0.004
						(1.184)						(0.105)						(0.593)
Observations	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,870	3,870	3,870	3,870	3,870	3,870
R-squared	0.490	0.490	0.492	0.491	0.491	0.491	0.286	0.287	0.286	0.286	0.286	0.286	0.470	0.469	0.471	0.471	0.471	0.468
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 10 Alternative variables estimations over time t to $t+2$

This table reports the panel regression model for the media sentiment measures as a function of long-term firm risk. The dependent variables are stock return volatility (natural log of total risk and natural log of idiosyncratic risk) and riskiness of investment (R&D expenditures and diversification) and financial policies (working capital, total book leverage and cash holding). The independent variables are media sentiment as well as the standard controls and year and industry (the two-digit SIC) fixed effects. Control variables includes number of articles, natural log of firm age, natural log of assets, market to book, sales growth, stock return, debt to equity, cash surplus, trading volume, board size, interlock, independence, CEO tenure, natural log of CEO age, natural log of cash compensation, CEO delta and CEO vega. The dependent variables are measured from t to $t+2$. All control variables are measured at time t-1. The *t*-statistics are reported in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Panel A: The volatility of stock return

Variables	Log of total risk $_{t \text{ to } t+2}$						Log of idiosyncratic risk $_{t \text{ to } t+2}$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Strong	0.061***						0.075***					
	(3.501)						(3.915)					
Positive		0.050***						0.070***				
		(2.635)						(3.093)				
Negative			0.031***						0.037***			
			(4.275)						(4.751)			
Weak				0.070***						0.098***		
				(2.639)						(3.759)		
Uncertainty					0.046***						0.068***	
					(2.647)						(3.806)	
Litigious						0.018						0.033*
						(1.018)						(1.801)
Observations	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703
R-squared	0.659	0.658	0.662	0.658	0.658	0.657	0.675	0.673	0.678	0.675	0.675	0.672
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Panel B: The riskiness of investment policies												
Variables	R&D to sales $_{t \text{ to } t+2}$						Diversification $_{t \text{ to } t+2}$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Strong	0.031*						-0.028					
	(1.873)						(-1.235)					
Positive		0.017*						0.011				
		(1.816)						(0.293)				
Negative			0.014**						0.024*			
			(2.064)						(1.858)			
Weak				0.049						-0.020		
				(1.616)						(-0.533)		
Uncertainty					0.037**						-0.012	
					(2.074)						(-0.447)	
Litigious						0.010						0.067
						(1.266)						(1.615)
Observations	2,680	2,680	2,680	2,680	2,680	2,680	2,703	2,703	2,703	2,703	2,703	2,703
R-squared	0.250	0.248	0.252	0.251	0.252	0.248	0.478	0.478	0.479	0.478	0.478	0.479
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Panel C: The riskiness of financial policies																		
Variables	Working capital $_{t \text{ to } t+2}$						Total book leverage $_{t \text{ to } t+2}$						Cash to assets $_{t \text{ to } t+2}$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Strong	0.003						0.009						0.012					
	(0.306)						(0.968)						(1.185)					
Positive		0.014						-0.014						0.019*				
		(1.180)						(-1.186)						(1.916)				
Negative			0.011**						0.007						0.010***			
			(2.382)						(1.432)						(3.121)			
Weak				0.030*						0.008						0.040**		
				(1.798)						(0.511)						(2.332)		
Uncertainty					0.016						0.009						0.025**	
					(1.357)						(0.822)						(2.294)	
Litigious						0.019						0.006						0.009
						(1.560)						(0.525)						(1.274)
Observations	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,703	2,934	2,934	2,934	2,934	2,934	2,934
R-squared	0.535	0.536	0.538	0.537	0.536	0.536	0.359	0.359	0.360	0.359	0.359	0.359	0.529	0.529	0.531	0.531	0.531	0.528
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES