Media Tone and CEO Human Capital

Jiexiang Huang[a,*], Helen Roberts[a] and Eric K.M. Tan[b]

Current Version: October 2018

Abstract

This study investigates the direct association between media tone and CEO human capital through the effects of media tone on CEO opportunity pay. Using CEO pay slice (CPS) as a measure of CEO opportunity pay, we find that negative media tone is associated with a reduction in CEO opportunity pay. The finding extends the theoretical framework explaining the importance and influence of media on corporate governance. Consistent with theoretical predictions, we find that the media serve as an effective external governance mechanism in the presence of firms with good internal governance. The evidence suggests that media tone plays an important role as an external monitor, moderating corporate governance through the dissemination of news.

JEL classification: G31; G32; G34

Keywords: Media tone; CEO human capital; CEO opportunity pay; Internal corporate governance

[*] Corresponding author: Jiexiang Huang.
Email address: jiexiang.huang@otago.ac.nz (Jiexiang Huang), helen.roberts@otago.ac.nz (Helen Roberts), e.tan@business.uq.edu.au (Eric K.M. Tan). All remaining errors are our own.
[a] Department of Accountancy and Finance, University of Otago, PO Box 56, Dunedin 9054, New Zealand
[b] UQ Business school, University of Queensland, 39 Blair Dr, St Lucia QLD 4067, Australia

We gratefully acknowledge the comments and suggestions from the 2018 Financial Markets and Corporate Governance Conference at La Trobe University. We declare that we have no relevant or material financial interests that relate to the research described in this paper.

Media Tone and CEO Human Capital

1. Introduction

Previous studies show that the media can detect corporate financial fraud and convey financial information to boards of directors (Miller, 2006; Joe et al., 2009). Drawing primarily from financial perspectives such as agency theory, these studies imply that the media act as a type of governance control mechanism. This topic has been developed by scholars and researchers in the corporate finance literature, demonstrating that the media plays an important corporate governance role by collecting and disseminating information about firms (Zingales, 2000; Fang and Peress, 2009). Early research on media and subsequent managers' actions suggests that media had little effect on manager behaviour. Core et al. (2008) point to a lack of influence of media coverage on subsequent excess CEO compensation and future CEO turnover. In this study, we seek to examine (1) whether media tone today can directly influence CEO opportunity pay in the future, and (2) how internal and external governance mechanisms interact to affect the relation between media tone and CEO opportunity pay.[1]

Based on the seminal paper by Fama (1980), the author argues that the managers' actions may influence their human capital. Revaluation of managerial human capital is a form of full ex-post settling up. The change in managers' human capital is determined by the revaluation of the managers' future pay in the labour market. Managers' opportunity pay is most likely affected by poor signals triggered in labour markets because of managers' actions (Fama, 1980). This framework implies that managers' human capital is the present value of the manager's future opportunity pay such that any current corporate actions undertaken by managers will influence the managers' future human capital.

1 The concept of "CEO opportunity pay" is derived from Fama (1980), which is connected with the CEO's future pay. An increasing level in CEO opportunity pay reflects the potential growth of managers' future pay.

Dyck et al. (2008) extend this idea by proposing that the media plays a governance role and has an impact on decision making by influencing the value of managers' human capital. In their empirical analysis, the media provides a monitoring role to minimize agency cost by reducing the reputational cost on firms and managers that affect shareholder interests adversely. The authors find that managers, in making decisions, may reverse self-serving action when they face greater media attention.

Liu and McConnell (2013) find that managers have human capital at risk in making corporate decisions and that media tone heightens the impact of a value-reducing acquisition on the manager's human capital. Their finding implies that negative media coverage diminishes the managerial labour market's perception of the managers' ability, thereby decreasing the value of managerial human capital. Such a finding supports the argument that media affects managers through its influence on the value of their human capital.

Using annual Fortune ranking score, Cheng et al. (2017) propose that media can decrease (increase) the value of managers' human capital and, thus, diminish (enhance) managerial power to extract corporate resources for private consumption. In this framework, the manifestation of a decrease in media's perception is a reduction in managers' power. This is the result of diminishing managerial human capital to the extent that the media affects managers' actions by influencing their human capital.

Previous literature, as mentioned above, documents that managers with greater negative media tone are associated with a lower human capital, thereby influencing managers' actions. However, the connections supporting such a presumption are indirect. In addition, an insignificant association between media tone and CEO compensation or turnover, as documented by Core et al. (2008), may underestimate the impact that media has on a CEO by influencing his or her human capital, which is inconsistent with the corporate governance role of media.

A recent study by Liu et al. (2017) shows that a direct connection between media coverage and CEO human capital is through the media's influence on the CEO opportunity set. While Liu et al. (2017) consider the number of board seats held by retired CEOs as a proxy for a CEO's future opportunity set, we instead rely on a relative measure of CEO opportunity pay: CEO pay slice (CPS). This measure was first proposed by Bebchuk et al. (2011) to measure the relative importance of the CEO within the top executive team. CPS is used in this study to examine whether current CEO media tone is directly associated with the CEO's future human capital.

The main idea for this study originated from Core et al. (2008), who find no association between media tone and CEO compensation. The explanation given for their findings is that a change in compensation policy may be difficult to detect when negative media attention imposes costs on firms. This study proposes an alternative explanation for the Core et al. (2008) finding using the CPS measure for the following reasons. First, we argue that CPS, defined as the relative measure of CEO pay to the top five paid managers in a firm, is more sensitive to media tone compared with CEO compensation alone. Second, CPS is a measure of the relative importance of the CEO in relation to the top five paid members of the management team. Third, CPS is a dynamic variable, meaning it can vary considerably, even under what might be considered a stable CEO compensation contract.

Although we conjecture that media tone will have a direct effect on the CEO opportunity pay, the effect may be moderated by a firm's internal governance mechanisms. We examine this relation in more detail by considering whether a board that has good internal governance is related to the effective influence of media tone on CEO opportunity pay. This follows the result from Core et al. (2008), who suggest that the lack of support for a relation between media coverage and CEO compensation may be due to poorly governed firms not responding

to external pressure due to the board being captured by the CEO. We address this explanation by considering the internal corporate governance mechanism within the firm.

Early literature argues that internal and external governance mechanisms can be viewed as substitutes (Pound, 1992). Jensen (1993) claims that the market for corporate control is the most efficient monitor due to the failure of internal control mechanisms. A firm with poor internal governance may be more closely followed by external monitors to make up for the lack of sufficient internal monitoring. However, previous literature does not answer the question of whether firms with both strong internal and external governance mechanisms perform differently to firms that have only one of these two mechanisms, particularly in reference to the monitoring of CEO actions.

Recent research shows that internal and external governance mechanisms complement each other, and that both types of governance are necessary to guarantee effective monitoring (Cremers and Nair, 2005; Lara et al., 2009). The main argument put forward by Cremers and Nair (2005) is that the market for corporate control (external governance) is important only in the presence of shareholder activism (internal governance). Although strong external governance disciplines managers to pursue shareholder interests, the internal governance mechanism is required for the external mechanism to function, which leads to a complementary relation between the two mechanisms. Firms that only have the external mechanism could differ in their governance standards from firms that have both internal and external mechanisms. That is, external governance cannot effectively monitor firm management without a consistent strong internal governance mechanism.

Internal governance reinforces the effectiveness of external governance and vice versa. Lara et al. (2009) consider that complementary relation between internal governance mechanisms and external governance mechanisms and its role in the implementation of accounting conservatism. The efficiency of internal governance mechanisms increases in the

presence of strong external monitoring. The improved efficiency, in turn, is then directly responsible for the day-to-day managerial monitoring. In other words, strong internal governance on its own is not sufficient to mediate CEO compensation and influence.[2]

By examining firms with poor and good internal corporate governance, we are able to investigate whether there is a complementary relation between the internal and external governance mechanisms as documented by Cremers and Nair (2005). Our contribution to this literature is that we consider media as the external governance mechanism, which is consistent with the prevailing agency logic to the extent that the perceptions of media coverage can effectively prompt firms to evaluate managers' actions and policies (Bednar, 2012; Liu et al., 2017). We provide new evidence on the complementary relation between internal and external governance mechanisms in monitoring CEO opportunity pay. In our context, we argue that media serves as an effective external governance mechanism in the presence of firms with good internal governance.

We consider the role of media tone and its impact on CEO human capital using a large sample of CEOs in the ExecuComp database and an extensive collection of 45,934 press articles about each CEO and his/her respective firm from 1996 to 2014. We require the company's CEO to be in office for two consecutive years in order to rule out issues concerning CEO turnover. This requirement also ensures that CEO media tone from the previous year can be used to explain CEO opportunity pay in the subsequent year. Our media tone measures are constructed following prior literature (Bednar, 2012; Liu and McConnell, 2013; Cheng et al., 2017). Using the financial dictionary developed by Loughran and McDonald (2011), we capture the negative tone of each article using the negative word counts.[3]

[2] This may be a possible explanation for the lack of evidence reported by Core et al. (2008) for the relation between media coverage and CEO compensation.

[3] Compared with positive press coverage, negative media coverage overcomes information asymmetry with management and is viewed as a credible source of information (Bednar et al., 2013). Most studies in the prior

To understand the influence of media tone on CEO human capital, it is important to consider the role of media in relation to CEOs. First, for participants in the market, the media provide a platform to publicize news concerning the firms' performance and CEOs' abilities by disseminating information. Second, the media convey information about firm performance, influencing public attitude and behaviour, and, as a result, help shape perceptions of CEO abilities. In particular, directors' perceptions for CEO abilities may change following firm disclosures by the media (Wade et al., 2006). Therefore, by disseminating information, the more negative media tone for the CEOs, the lower the level of future CEO opportunity pay.

Our paper provides the following predictions. First, negative media tone today decreases future CPS. Second, firms with strong internal governance that experience more negative media tone experience reductions in CPS. The prediction implies that bad publicity for the CEO results in lower CEO pay relative to the top management team, specifically in a firm that exercises good internal governance.

We begin our empirical analysis by investigating the direct link between media tone and CEO human capital. The empirical results point to the role that negative media tone plays in reducing the CPS in following year. The finding, consistent with prior literature by Dyck et al. (2008) and Liu and McConnell (2013), emphasizes the economic relevance of media on monitoring and constraining the CEO by disseminating information.

Furthermore, our study finds that media exposure plays an important role even after controlling for the existence of an internal corporate governance mechanism. We classify the internal corporate governance of a firm by board size, independent directors, CEO duality, and key subordinate executive horizon. Then, we create a measure of internal governance, employing a composite measure created from the four components of internal corporate governance. Our finding suggests that when firms have efficient internal monitoring, media

literature focus solely on negative tone, as there is little incremental information in positive words (Core et al., 2008; Liu and McConnell, 2013). As such, following prior literature, our study investigates solely the negative tone in news.

tone is observed to influence CEO opportunity pay, thereby supporting our earlier conjecture about the complementary relation between internal and external governance mechanisms.

In addition, when firms draw the attention of directors, the media may cater to audience demand by reporting sensitive topics without in-depth analysis (Core et al., 2008; You et al., 2017). To address this potential endogeneity issue between media tone and CEO opportunity pay, we rely on location as our instrumental variable in the two-stage least-squares (2SLS) framework and we find consistent results.

Our study implies that contemporaneous media tone influences future CEO opportunity pay by disseminating information and shaping perceptions about the CEO. We propose a direct economic link between media tone and CEO human capital. These results support the proposition from Dyck et al. (2008) and Liu and McConnell (2013) that, by influencing managers' human capital, media can exercise a role of corporate governance. Furthermore, most importantly, our finding suggests that firms with good internal governance are more likely to respond to external pressure by decreasing CEO opportunity pay, which supports the view of a complementary relation between internal and external governance mechanisms (Cremers and Nair, 2005). Thus, the paper contributes to the prior literature on the real effects of media tone.

The rest of the paper is organized as follows. Section 2 describes the sample selection and the construction of our variable. The empirical results are presented in section 3. Section 4 presents the robustness tests. Finally, section 5 summarizes the results and concludes.

2. Data

Our sample consists of the CEO and the other top four highest-paid executives for all S&P 500 companies over the 19-year period from 1996 to 2014, as identified in the ExecuComp database. 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. Media data are obtained from articles in the Factiva database. We gather data on CEO characteristics and compensation for the five highest-paid managers from the ExecuComp database. Information on firm characteristics is sourced from Compustat and the Centre for Research in Security Prices (CRSP). Governance variables are obtained from RiskMetrics, ExecuComp, and the Compustat databases.

2.1. Media tone

To construct the negative tone measures, we rely on four major newspapers and one magazine: (1) *The Wall Street Journal*, (2) *The Washington Post*, (3) *The New York Times*, (4) *USA Today*, and (5) *Forbes* (Core et al., 2008; Francis et al., 2008; Bednar, 2012; Bednar et al., 2013). Media data are obtained from news articles in the Factiva database by searching for the name of the CEO and the firm collectively as reported in ExecuComp database. To ensure that we capture all articles regarding the CEO and the firm, we also search for shortened names (e.g., Dan for Daniel) and common nicknames (e.g., Chuck for Charles). In addition, we also consider the name of the firm managed by the CEO and the stock ticker symbol (e.g., BLL for Ball Corporation) as search criteria.

We develop a PERL program to analyse the text of each article. To make sure we include only relevant articles, we impose certain criteria to eliminate irrelevant articles which provide no valid information (e.g. a firm or a CEO included in a list or table). Articles containing fewer than 50 words are not included in our sample. We impose one further requirement that the news articles contain the CEO's family name and the firm name at least twice. Finally,

our sample does not include articles that have irrelevant titles.[4] We identify these titles via a random reading of approximately 500 articles from the sample.

We calculate the percentage of negative words using the Loughran and McDonald (2011) financial dictionary relative to the total number of words in each article. Negative tone (Negtone) is equal to the mean score for the negative words category from all articles about a particular firm in a given year. In addition, we also consider the number of articles for each CEO in a given year.

2.2. CEO pay slice

We consider CPS as the measure of CEO opportunity pay. Following Bebchuk et al. (2011), we compute CPS based on total compensation as presented in equation (1) below.

$$CPS_{i,t} = \frac{CEO\ \ Compensation_{i,t}}{\sum Top\ Five\ Executive\ Compensations_{i,t}} \quad (1)$$

CPS is defined as the ratio of the CEO's total compensation relative to the sum of the compensation paid to the top five executives (including the CEO).[5] Total compensation includes salary, bonus, other annual pay, the total value of restricted stock granted during the year, the Black and Scholes value of stock options granted during the year, long-term incentive payouts, and all other total compensation (as reported in ExecuComp item TDC1). Following the change in executive compensation reporting requirements due to FAS123R in 2006, ExecuComp compensation data are not comparable before and after 2006 (Coles et al., 2007; Brockman et al., 2016). We follow the approach proposed by Coles et al. (2007) and applied by Brockman et al. (2016) to adjust ExecuComp's total compensation (TDC1) data in

[4] We exclude some articles with contents unrelated to the firms and CEOs, such as a list or table. For example, an article entitled "Top 100 CEOs" which reports a ranking list of CEOs with the highest compensation. In addition, we also do not consider articles including 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 CEO that are of interest to us.

[5] Firms are required to report the compensation for anyone holding office, which includes the CEO and all other executives. Following Bebchuk et al. (2011), we restrict the sample to firms that report compensation for only five executives. We exclude those firms that report compensation for fewer than five executives.

the pre-2006 period. Appendix A shows additional details on the calculation of this variable. We restrict our sample to those observations where the CEO was in office for two consecutive years. The intuition behind using CPS is to capture the observable and unobservable dimensions of the firm's top executives' compensation model. Thus, we argue that CPS captures dimensions of the CEO's role in the top team beyond the measure of board involvement.

2.3. Internal corporate governance

Stakeholders in the firm, particularly subordinate managers, are more important for internal corporate governance. Even if the CEO acts on individual short-term private interest, stakeholders can force the CEO to act in a more public-spirited and far-sighted way (Acharya et al., 2011). Thus, we look at the corporate internal governance to assess the power of the CEO relative to the board and top management team.

Following prior literature, we consider four common items: the board size (Baldenius et al., 2014), independent directors (Fama and Jensen, 1983), CEO duality (Adams et al., 2005), and key subordinate executives' horizon (Cheng et al., 2015) as metrics of the internal governance index.[6] By combining all four items so that they load into one factor, we create a factor score that equally weights each of the internal governance items. The internal governance index is based on the average of the sum of the four metrics. A higher index score indicates better internal governance.

2.4. Control variables

[6] The board size indicator equals one if board size is greater than the median value in a given year and zero otherwise. The independent director indicator equals one when the percentage of independent directors is greater than the median value in a given year and zero otherwise. The CEO duality indicator equals zero if the CEO is a chairman and one otherwise. The subordinate executive horizon equals one if their horizon is greater than the median value in a given year and zero otherwise.

Following prior literature, we construct firm and CEO characteristics as the control variables (Bebchuk et al., 2011; Bednar et al., 2013). CPS has a rich set of relations with firm performance and behaviour (Bebchuk et al., 2011). We control for industry-adjusted Tobin's Q as a measure of firm value, following a substantial literature on the association between firm value and various corporate arrangements (Yermack, 1997; Gompers et al., 2003). We also control for firm size using the natural log of assets,[7] Leverage, ROA, Capex/Assets, R&D, Company age and Diversified using data from the Compustat and CRSP databases.

We employ CEO characteristics controls referred to in Bebchuk et al. (2011), including Relative equity, CEO age, CEO tenure, and CEO outsider. Firms with an insider CEO may be more heterogeneous in nature, implying CEO talent is hard to replicate in the firm (Parrino, 1997). However, an outsider CEO can receive more compensation attributed to a unique individual skill set (Murphy and Zabojnik, 2007).

We also consider governance characteristics in our empirical model. We control for a number of board characteristics. Numerous board governance variables are obtained through the ExecuComp and CRSP databases. This includes CEO ownership, Number of vice presidents (VPs), and Insider ownership following Bebchuk et al. (2011). We also consider the roles of the Chairman and the Founder as control variables. The size of the board is more likely to influence the CEOs' power. We also obtain commonly used measures of corporate governance quality from the RiskMetrics database, including the percentage of appointed directors (Appointed), percentage of independent directors (Independent), board interlocking, and board size.

2.5. Summary statistics

[7] The empirical results reported in this paper use the natural log of total assets to control for firm size, which is consistent with the control measure used by Bebchuk et al. (2011). However, we also estimate the models using the natural log of market capitalization and the natural log of revenue (Core et al., 2008), respectively, as separate controls for firm size. Our results using these measures of firm size from the unreported estimations are consistent with those reported throughout the paper.

Table 1 presents the descriptive statistics for our dependent and independent variables. We present the variable definitions in Appendix B. We find that the mean CPS is 0.4, which is consistent with the number (i.e. 0.357) reported by Bebchuk et al. (2011). As shown in the media variables section, the average Negtone is approximately 0.968%. Thus, on average, 0.968% of the words in the articles about the CEO and the firm have a negative tone in a financial context. The summary statistics for firm and CEO characteristics are also reported in Table 1. The average measures for industry-adjusted Tobin's Q and Leverage are similar to those reported by Bhagat and Bolton (2008). The mean of CEO tenure is approximately 7.2, which is consistent with the variable reported in Bebchuk et al. (2011). The summary statistics for the other variables show that the average CEO age, Chairman, and Board size are around 56, 0.65, and 10.33, respectively. These values are comparable to the ones reported in Brockman et al. (2016).

< Insert Table 1 here >

Table 2 presents a matrix of estimated correlation coefficients for media measures and control variables. Consistent with our expectation, the Negtone and CPS variables are negatively correlated at 0.79%. While the rank order correlation is slightly higher for some variables (notably, Firm size and Board size=50.7%; Insider ownership and CEO ownership = 46.3%; Company age and Firm size = 45.5%; Number of VPs and CEO ownership = 40.4%), the variance inflation factors from the empirical estimations are all below 3 (not reported), which indicates that multicollinearity is not a concern for the regression analysis.

< Insert Table 2 here >

3. Empirical results

3.1. Univariate analysis

We investigate the relation between negative media tone and CPS. For each firm, high (low) CPS is greater (lower) than the median value of CPS in a given year. We compute net change in CPS based on the difference of CPS from *t*-1 to *t*. The annual median negative media tone is used to divide our sample of firms into two negative media-tone portfolios for each previous year. Firms with a negative media tone less than the median are categorised as low negative tone and those above the median are classed as high negative tone.

The results in Table 3 indicate CPS and net change in CPS for the current year with different types of negative media tone. Row 1 in Panel A shows that the average CPS for firms with low negative tone is 0.41; the average CPS for firms with high negative tone is 0.39. The difference between the average CPS for low- and high-negative-tone groups is statistically significant. Similar patterns hold for both high CPS and low CPS. As shown in Row 2 of Panel B, 6.67% of CEOs receiving a low negative media tone experience a net decrease in their CPS. In comparison, 7.45% of CEOs with a high negative media tone experience a net decrease in their CPS. The difference between net decreases in CPS for high and low negative media tone is negative and significant. Therefore, lower negative media tone is associated with a higher CPS and a lower net decrease in CPS.

< Insert Table 3 here >

3.2. Impact of negative tone on CPS

In this section, we discuss our empirical results concerning the association between negative tone and CEO opportunity pay. As discussed above, we measure CEO opportunity pay by relying on total compensation following Bebchuk et al. (2011) in year t. All standard errors are clustered at the firm level to account for correlations within firm observations. The control variables include Industry-adjusted Tobin's Q, Log book value, Leverage, ROA, Capex/Assets, R&D, Company age, Diversified, Relative equity compensation, CEO tenure,

and CEO Outsider, along with firm and year fixed effects. We also include governance control variables as a subsequent robustness test. The full descriptions of the control variables are provided in Appendix B. The results of these estimations are presented in Table 4.

< Insert Table 4 here >

The pooled panel regression results, displayed in Columns 1 and 2 of Table 3, indicate a strong negative association between negative tone and CPS. Negtone reports a negative and statistically significant coefficient with and without governance control variables. In Column 1, Negtone has strong economic significance: a one-standard-deviation increase in negative tone (equal to 0.948) decreases CPS by 0.76%.[8] Similarly, in Column 2, a one-standard-deviation increase in the negative tone of media coverage translates into a decrease in CPS of 0.66%.[9] Using the median measures of CEO compensation, these changes correspond to decreases of $9,113.255 ($7,974.895) for a 10% increase in negative tone.[10] The findings imply that CEO opportunity pay as measured by CPS is diminished when media coverage has a more negative tone. Thus, the more bad press a CEO and his/her firm is exposed to, the greater the subsequent decrease in CPS. The findings are consistent with our first prediction and provide some evidence that media tone plays an important governance role by influencing CEO opportunity pay.

3.3. Negative tone and corporate governance

We further examine the association between negative tone and CPS by taking into consideration the role of a firm's internal corporate governance mechanism. We conduct our analysis on the relationship between CPS and negative media tone using the subsamples of

[8] 0.008 × 0.948 = 0.76%
[9] 0.007 × 0.948 = 0. 66%
[10] For a 10% increase in negative tone, we use $CPS \approx 10\%\beta$ to compute change in CEO pay. We then get $\frac{(\beta \cdot 10\%)Top\ 4}{1-\beta \cdot 10\%}$ to calculate the dollar value of the change in the median level of CEO pay using the median pay for the top four paid executives. CPS equals to CEO pay plus top 4. Top 4 is the median value of pay for the top four executives other than the CEO. β is the estimated coefficient of Negtone.

firms with good and poor internal corporate governance. This is to take into account one potential explanation, as documented by Core et al. (2008), that poorly governed firms do not respond to external stress resulting in media tone having no observed influence on CEO compensation. To do this, we rely on several governance proxies (e.g., board size, independent directors, CEO duality, and key subordinate executives' horizon) to construct a governance index. The results are reported in Table 5.

< Insert Table 5 here >

Table 5 reports the subsample analysis after separating the firms according to the level of internal governance (poor or good) as determined by the governance index. The governance index is defined as the average of the four internal governance metrics: board size, independent directors, CEO duality, and key subordinate executives' horizon. The internal governance index ranges from zero to one, where higher values indicate stronger internal corporate governance and less entrenched management. There is no significant association between negative media tone and CPS for firms with poor internal governance as shown in Columns 1 and 2. The result is consistent with the above explanation from Core et al. (2008). We then find strong evidence that negative media tone significantly decreases CEO power for firms with good internal governance. The coefficient on Negtone is negative and statistically significant ($p<0.01$) as reported in Columns 3 and 4. Overall, the findings support our second prediction that the effect of media on CEO opportunity pay is stronger for firms with good internal governance. This result is consistent with the complementary relation between the internal and external governance mechanisms (Cremers and Nair, 2005), whereby media serves as an effective external governance mechanism for firms in the presence of good internal governance.

4. Robustness tests

4.1. Endogeneity

A concern with our empirical analysis is that CEOs with higher compensation experience more negative media coverage (Core et al., 2008). This association may lead to a reverse causality problem. To address this concern, we use an instrumental variable approach and estimate our model using a 2SLS framework. For media, we consider an instrument along the lines proposed by Gurun and Butler (2012). The finding of Gurun and Butler (2012) implies that a firm located near to the headquarters of media outlets receives media coverage with a less negative tone compared with those firms located further away. We consider a dummy variable, Location, which equals one if both the firms and the headquarters of media outlets are located in the same state.[11]

The results of the first-stage pooled ordinary least square (OLS) regression in which Negtone is the dependent variable are reported in Columns 1 and 2 of Table 6. The models in Column 1 exclude governance variables and the model in Column 2 includes these control variables. We find Location to be negatively related to Negtone and statistically significant as shown in Columns 1 and 2, respectively. This is consistent with prior research that a firm located further away from the media source is more likely to receive negative media coverage (Engelberg and Parsons, 2011; Gurun and Butler, 2012; You et al., 2017). These results indicate that our instrument is valid and strong (Staiger and Stock, 1994).

< Insert Table 6 here >

In Columns 3 and 4 of Table 6, we report the results of the second-stage regression in which we use CPS as the dependent variable and the predicted variables for Negtone together with the other control variables used in Table 4. The coefficient on Negtone is negative and statistically significant when excluding and controlling for governance control variables (-

[11] We find 20% of firms in our sample to be located in the same state as the main media outlets.

0.604, p<0.01 and -0.632, p<0.01, respectively). Specifically, a one-standard-deviation increase in Negtone is associated with a 0.576 (0.602) decrease in CPS. These findings are consistent with the view that CEOs will experience a decrease in CPS after exposure to media coverage with a negative tone in the prior year. Overall, the results reported in Table 6 support our prediction; that is, negative media tone today reduces CEO opportunity pay in the future. Therefore, these results imply that media tone plays an important monitoring role by influencing the value of CEO human capital.

4.2. Pre-2006 versus post-2006 periods

In 2006, the vast majority of firms switched to new reporting requirements (FAS123R), making the disclosure of executives' compensation relative to pre-2006 directly incomparable (Coles et al., 2014). In Table 7, given this significant change in executive compensation disclosure, we examine the role of negative tone on CEO opportunity pay in the 1996–2005 period (Columns 1 and 2) and the 2007–2014 period (Columns 3 and 4), respectively. We find that the coefficient of Negtone is negative and statistically significant during the post-2006 period. The robustness test suggests that the effect of negative tone on CPS is more prevalent in the recent years. The importance of more recent observations is consistent with the influence and prominence of the media and theirs role in society as a disseminator of information during the latter part of the study. Therefore, it makes intuitive sense that we find greater association in the post-2006 period compared with the pre-2006 period. This result is also consistent with the technological and cultural change in the role and impact of the media concerning the communication of information. Our results on negative tone in the post-2006 period are consistent with the main findings presented in Table 4.

< Insert Table 7 here >

4.3. Firm without media coverage

Our primary sample includes firms without media coverage; in this case, the value of negative media tone is set to zero. One may argue that firms without media attention could potentially affect our results. We address this concern in two ways by re-estimating the model reported in Table 4. First, following Liu and McConnell (2013), we set negative media tone to the average negative tone in the two-digit SIC group for each year if a firm has no media exposure. The result is shown in Columns 1 and 2 of Table 8. The Negtone coefficient is negative and statistically significant, which is consistent with the results reported in Table 4. Second, we omit firms without media coverage to eliminate the influence of these firms on our results. The estimated coefficients for Negtone reported in Columns 3 and 4 still have the same sign and the same levels of statistical significance as those shown in Table 4.

< Insert Table 8 here >

4.4. Positive favorability in media coverage

This paper only considers the influence of negative media tone on CEO opportunity pay, but it omits positive media tone because prior literature has shown little incremental information from positive words (Kothari et al., 2002; Tetlock, 2007; Liu et al., 2017). To do this, we define a new measure of media tone called positive favorability. Positive favorability is defined as the difference between the number of positive and negative words, divided by the number of words in each article. Compared with negative media tone, we argue that positive favorability is more likely to increase CEO opportunity pay. We then re-estimate the models reported in Table 4 and 5 using this measure.

In Table 9, we find the coefficient of positive favorability to be positively associated with CPS. This suggests that CEO opportunity pay increases when media tone conveys greater positive favorability. As shown in Table 10, the significant positive regression coefficient on

the Positive favorability variable suggests a positive relation between positive favorability and CEO opportunity pay for firms with good internal corporate governance. Consistent with the explanation as proposed by Cremers and Nair (2005), our finding suggests that media tone serves as an effective monitor in well-governed firms.

< Insert Table 9 here >

< Insert Table 10 here >

4.5. Clustering by CEO-firm combination

One may argue that clustering by the CEO-firm combination in a regression may yield different inferences in tests involving executive pay variables. To address this concern, we re-estimate the regressions reported in Tables 4 and 5, adjusted by CEO-firm combination clustering. As shown in Tables 11 and 12, the results show that the negative media tone coefficients continue to have the same regression coefficient signs and the same levels of statistical significance, which provide consistent estimates with those reported in Tables 4 and 5.

< Insert Table 11 here >

< Insert Table 12 here >

4.6. Extreme observations

To address concerns that the empirical associations are the spurious results of extreme observations, we re-estimate the models reported in Tables 4 in which variables are winsorized at the 5^{th} and 95^{th} percentile. The unreported finding continues to show a negative association between negative tone and CPS, which is consistent with our previous results.

5. Conclusion

Media plays a powerful role for public discourse in shaping the public's perceptions of various issues (Rogers et al., 1993). The role of media concerning corporate governance also continues to be an extremely controversial topic. Core et al. (2008) show an insignificant relation between media tone and CEO compensation. Their study suggests that media tone does not influence CEO opportunity pay. One interpretation of this result is that a change in compensation policy may be difficult to detect when negative media attention imposes a cost on firms. We consider CEO pay slice (CPS) as a proxy of CEO opportunity pay to investigate the association between media tone and CEO opportunity pay. Drawing on previous literature, we interpret this finding to suggest that a more negative media tone is associated with a reduction in managers' human capital, thereby influencing managerial actions (Dyck et al., 2008; Liu and McConnell, 2013).

This study provides a solution to part of the missing link between media tone and the value of a CEO's human capital, thereby supporting the presumption of Liu and McConnell (2013). While Liu and McConnell (2013) use board seats as the CEO income-produced opportunity, we use CPS as a measure of the CEO opportunity pay to explain the association between media coverage and CEO human capital. Additionally, prior literature views the media as an information intermediary, and scholars believe that the media are an important communication tool (Bushee et al., 2010). Our findings support the role of media tone as a corporate governance mechanism that influences the value of CEO human capital.

Furthermore, this paper seeks to find an approach that overcomes the dilemma cited by Core et al. (2008) by examining a missing link between negative tone and CEO opportunity pay. This is achieved by taking into consideration the firm's internal corporate governance mechanism. It is possible that CEOs are more sensitive to media in firms with good internal governance, and, as a consequence, the media can and do play a monitoring role in firm governance (Cheng et al., 2017). Using a self-constructed governance index, we report

largely consistent findings in support of our conjecture. We show that the negative relation between negative tone and CEO opportunity pay is concentrated among firms with high-quality governance. Consistent with the complementary relation between internal and external governance mechanism as documented by Cremers and Nair (2005), in our context, we find media serves as an effective external governance mechanism in firms with good internal governance.

We acknowledge that this research is not the only way to investigate the association between media tone and CEO human capital using the influence of media tone on CEO opportunity pay. Future work may consider other potential variables with respect to CEO human capital to study this issue. Furthermore, we may build on this research and investigate whether the current results extend to different contexts (i.e. similar effects on CEO power in different countries or cultures). One could look at different types of media, such as websites or social news. In summary, we hope that this study can help to further a behavioural view on the role of the media in corporate governance.

References

Acharya, V.V., Myers, S.C., Rajan, R.G., 2011. The internal governance of firms. The Journal of Finance 66, 689-720.

Adams, R.B., Almeida, H., Ferreira, D., 2005. Powerful CEOs and their impact on corporate performance. The Review of Financial Studies 18, 1403-1432.

Baldenius, T., Melumad, N., Meng, X., 2014. Board composition and CEO power. Journal of Financial Economics 112, 53-68.

Bebchuk, L.A., Cremers, K.M., Peyer, U.C., 2011. The CEO pay slice. Journal of Financial Economics 102, 199-221.

Bednar, M.K., 2012. Watchdog or lapdog? A behavioral view of the media as a corporate governance mechanism. Academy of Management Journal 55, 131-150.

Bednar, M.K., Boivie, S., Prince, N.R., 2013. Burr under the saddle: how media coverage influences strategic change. Organization Science 24, 910-925.

Bhagat, S., Bolton, B., 2008. Corporate governance and firm performance. Journal of Corporate Finance 14, 257-273.

Brockman, P., Lee, H.S.G., Salas, J.M., 2016. Determinants of CEO compensation: generalist-specialist versus insider-outsider attributes. Journal of Corporate Finance 39, 53-77.

Bushee, B.J., Core, J.E., Guay, W., Hamm, S.J., 2010. The role of the business press as an information intermediary. Journal of Accounting Research 48, 1-19.

Cheng, Q., Lee, J., Shevlin, T., 2015. Internal governance and real earnings management. The Accounting Review 91, 1051-1085.

Cheng, Y., Liu, B., McConnell, J.J., Rosenblum, A., 2017. When is good news bad and vice versa? The Fortune rankings of America's most admired companies. Journal of Corporate Finance 43, 378-396.

Coles, J.L., Daniel, N.D., Naveen, L., 2007. Co-opted boards: costs, benefits, causes and consequences. Working paper, Arizona State University, Drexel University, and Temple University.

Coles, J.L., Daniel, N.D., Naveen, L., 2014. Co-opted boards. The Review of Financial Studies 27, 1751-1796.

Core, J.E., Guay, W., Larcker, D.F., 2008. The power of the pen and executive compensation. Journal of Financial Economics 88, 1-25.

Cremers, K., Nair, V.B., 2005. Governance mechanisms and equity prices. The Journal of Finance 60, 2859-2894.

Dyck, A., Volchkova, N., Zingales, L., 2008. The corporate governance role of the media: evidence from Russia. The Journal of Finance 63, 1093-1135.

Engelberg, J.E., Parsons, C.A., 2011. The causal impact of media in financial markets. The Journal of Finance 66, 67-97.

Fama, E.F., 1980. Agency problems and the theory of the firm. Journal of Political Economy 88, 288-307.

Fama, E.F., Jensen, M.C., 1983. Separation of ownership and control. The Journal of Law & Economics 26, 301-325.

Fang, L., Peress, J., 2009. Media coverage and the cross-section of stock returns. The Journal of Finance 64, 2023-2052.

Francis, J., Huang, A.H., Rajgopal, S., Zang, A.Y., 2008. CEO reputation and earnings quality. Contemporary Accounting Research 25, 109-147.

Gompers, P.A., Ishii, J.L., Metrick, A., 2003. Corporate governance and equity prices. The Quarterly Journal of Economics 118, 107-156.

Gurun, U.G., Butler, A.W., 2012. Don't believe the hype: local media slant, local advertising, and firm value. The Journal of Finance 67, 561-598.

Jensen, M.C., 1993. The modern industrial revolution, exit, and the failure of internal control systems. The Journal of Finance 48, 831-880.

Joe, J.R., Louis, H., Robinson, D., 2009. Managers' and investors' responses to media exposure of board ineffectiveness. Journal of Financial and Quantitative Analysis 44, 579-605.

Kothari, S., Laguerre, T.E., Leone, A.J., 2002. Capitalization versus expensing: evidence on the uncertainty of future earnings from capital expenditures versus R&D outlays. Review of Accounting Studies 7, 355-382.

Lara, J.M.G., Osma, B.G., Penalva, F., 2009. Accounting conservatism and corporate governance. Review of accounting studies 14, 161-201.

Liu, B., McConnell, J.J., 2013. The role of the media in corporate governance: do the media influence managers' capital allocation decisions? Journal of Financial Economics 110, 1-17.

Liu, B., McConnell, J.J., Xu, W., 2017. The power of the pen reconsidered: the media, CEO human capital, and corporate governance. Journal of Banking & Finance 76, 175-188.

Loughran, T., McDonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. The Journal of Finance 66, 35-65.

Miller, G.S., 2006. The press as a watchdog for accounting fraud. Journal of Accounting Research 44, 1001-1033.

Murphy, K.J., Zabojnik, J., 2007. Managerial capital and the market for CEOs. Working paper, University of Southern California.

Pound, J., 1992. Raiders, targets, and politics: the history and future of American corporate control. Journal of Applied Corporate Finance 5, 6-18.

Rogers, E.M., Dearing, J.W., Bregman, D., 1993. The anatomy of agenda-setting research. Journal of Communication 43, 68-84.

Staiger, D.O., Stock, J.H., 1994. Instrumental variables regression with weak instruments. Econometrica 65, 557-86.

Tetlock, P.C., 2007. Giving content to investor sentiment: the role of media in the stock market. The Journal of Finance 62, 1139-1168.

Wade, J.B., Porac, J.F., Pollock, T.G., Graffin, S.D., 2006. The burden of celebrity: the impact of CEO certification contests on CEO pay and performance. Academy of Management Journal 49, 643-660.

Yermack, D., 1997. Good timing: CEO stock option awards and company news announcements. The Journal of Finance 52, 449-476.

You, J., Zhang, B., Zhang, L., 2017. Who captures the power of the pen? The Review of Financial Studies 31, 43-96.

Zingales, L., 2000. In search of new foundations. The Journal of Finance 55, 1623-1653.

Appendix A. Adjusted CEO compensation

The annual compensation pre-2006 and post-2006 is not strictly comparable because following FAS 123R, ExecuComp changed the format used to compute compensation data in 2006. We elaborate pre-2006 equations on TDC1, cash, equity, and option as below.

$$TDC1 = SALARY + BONUS + RSTKGRNT + Performance\ based\ stock\ award + OPTION\_AWARDS\_BLK\_VALUE + Performance\ based\ option\ award + OTHANN + ALLOTHTOT \quad (A1)$$

$$CASH = SALARY + BONUS \quad (A2)$$

$$EQUITY = RSTKGRNT + Performance\ based\ stock\ award \quad (A3)$$

$$OPTION = OPTION\_AWARDS\_BLK\_VALUE + Performance\ based\ option\ award \quad (A4)$$

We subtract long-term incentive plans (LTIP) from TDC1 and then add the performance-based stock awards (SHRTARG × PRCC_F) and the performance-based option awards to TDC1 (LTIP and SHRTARG as reported in ExecuComp and PRCC_F as reported in Compustat).[12] Cash compensation includes salary and bonus in our data. Equity compensation includes the value of stock grants and option grants. We adjust the pre-2006 data that are from options granted using Black-Scholes methodology (item OPTION_AWARDS_BLK_ VALUE), restricted stock grant (item RSTKGRNT), the performance-based stock awards, and the performance-based option awards, respectively. This measure is based on the grant-date fair value of option awards and stock awards after 2006 (item OPTION_AWARDS_FV and STOCK_AWARDS_FV, separately). Option compensation is from options granted using Black-Scholes methodology before 2006 and the grant-date fair value of option awards after 2006.

[12] Following Coles et al. (2014), we estimate performance-based option awards using the target number of options, the reported exercise price, time-to-maturity, and other variables needed for the Black-Scholes value.

Appendix B. Variable definitions

CEO power measures	
CPS_t	The ratio of CEO total compensation (ExecuComp item TDC1) relative to the sum paid to the top five paid executives including the CEO
Media variables	
Negtone (%)	The average ratio of negative toned words to total words based on financial dictionary following Loughran and McDonald (2011)
Number of articles	The number of articles for each firm in a given year
Firm-specific variables	
Industry-adjusted Tobin's Q	Tobin's Q is defined as the book value of assets plus market value of equity minus the sum of book value of common stock and deferred taxes, all divided by book value of assets. The industry measure is calculated based upon the four-digit SIC industry codes
Firm size	The natural logarithm of the book value of assets
Leverage	The ratio of long-term debt to assets
ROA	Return on assets, the operating income divided by book value of assets
Capex/assets	The ratio of capital expenditures to assets
R&D	The ratio of research and development expense to sales
Company age	The current year minus the year in which the company was first listed on the center for research in security prices (CRSP) database
Diversified	A dummy variable equal to one if the firm reports more than one segment
CEO-specific variables	
Relative equity	The ratio of the fraction of equity compensation of the CEO to the average fraction of equity compensation of the other four top executives
CEO age	The age of CEO in years
CEO tenure	Number of years the CEO is in office
CEO outsider	A dummy equal to one if the CEO was working at the firm for less than one year before becoming CEO
Governance-specific variables	
CEO ownership	A dummy equal to one if the CEO holds at least 20% of outstanding shares
Chairman	A dummy variable equal to one if the CEO is the chairman of board, zero otherwise
Founder	A dummy variable equal to one if the CEO is a founder of the firm, zero otherwise
Number of VPs	Number of vice presidents
Insider ownership	The fraction of shares held by all insiders
Appointed	The percentage of new directors appointed during the CEO's tenure
Independent	The percentage of outsider directors sitting on the board of directors
Board interlock	A dummy variable equal to one if the firm has at least one director who serves on board of another firm, zero otherwise
Board size	The number of directors
Instrumental variable	
Location	A dummy variable equal to one if both the firms and the headquarters of media outlets are located in the same state, zero otherwise

Table 1: Descriptive statistics

This table reports the number of observations, mean, median, standard deviation, minimum, and maximum for each variable in the sample. The variables are grouped according to the following classifications: CEO power, media, firm-specific, CEO-specific, and governance-specific. The sample contains 4,534 observations for all S&P 500 firms in ExecuComp from 1996 to 2014. Definitions for all variables are provided in Appendix B.

Variable	Obs.	Mean	Median	Std Dev.	Min	Max
CEO power measures						
CPS_t	4,295	0.400	0.411	0.118	0.000	0.987
Media variables						
Negtone (%)	4,534	0.968	0.953	0.948	0.000	7.099
Number of articles	4,534	6.973	1.000	20.948	0.000	367.000
Firm-specific variables						
Industry-adjusted Tobin's Q	4,529	2.307	1.948	1.456	0.702	27.087
Firm size	4,533	8.847	8.792	1.371	3.871	13.589
Leverage	4,521	0.314	0.193	0.436	0.000	9.109
ROA	4,533	0.168	0.162	0.088	-0.641	0.897
Capex/assets	4,505	0.057	0.041	0.053	0.000	0.804
R&D	4,534	0.052	0.006	0.181	0.000	5.682
Company age (years)	4,348	32.783	31.917	17.930	1.417	64.417
Diversified	4,532	0.921	1.000	0.270	0.000	1.000
CEO-specific variables						
Relative equity	4,319	1.144	1.123	0.610	0.000	21.673
CEO age (years)	4,301	55.673	56.000	6.523	27.000	83.000
CEO tenure (years)	4,534	7.247	5.417	6.345	1.000	51.000
CEO outsider	4,534	0.146	0.000	0.353	0.000	1.000
Governance-specific variables						
CEO ownership	4,534	0.227	0.000	0.419	0.000	1.000
Chairman	4,534	0.645	1.000	0.479	0.000	1.000
Founder	4,534	0.066	0.000	0.249	0.000	1.000
Number of VPs	4,534	1.423	1.000	1.459	0.000	5.000
Insider ownership	4,534	0.009	0.000	0.033	0.000	0.377
Appointed (%)	3,497	56.741	46.154	42.843	0.000	100.000
Independent (%)	3,497	74.358	77.778	15.847	0.000	94.737
Board interlock	3,497	0.051	0.000	0.268	0.000	3.000
Board size	3,497	10.326	10.000	2.297	4.000	19.000

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 CEO power, media, firm, CEO, and governance control variables. Definitions for all variables are provided in Appendix B.

	Variables	1	2	3	4	5	6	7	8	9	10	11	12
1	CPS	1.000											
2	Negtone	-0.008	1.000										
3	Number of articles	-0.122	0.233	1.000									
4	Industry-adjusted Tobin's Q	-0.088	-0.064	0.005	1.000								
5	Firm size	0.116	0.366	0.371	-0.287	1.000							
6	Leverage	0.006	0.020	0.025	-0.189	0.106	1.000						
7	ROA	-0.007	-0.073	-0.037	0.285	-0.143	-0.329	1.000					
8	Capex/assets	-0.048	-0.070	-0.029	-0.033	-0.048	0.094	0.170	1.000				
9	R&D	-0.067	0.005	0.003	0.170	-0.174	0.337	-0.292	-0.085	1.000			
10	Company age	0.199	0.178	0.074	-0.214	0.455	-0.075	-0.069	-0.128	-0.137	1.000		
11	Diversified	0.003	0.021	0.048	0.028	0.076	-0.058	0.006	-0.150	-0.001	0.101	1.000	
12	Relative equity	0.137	-0.015	-0.092	-0.061	0.009	-0.003	0.007	0.001	-0.036	0.100	0.006	1.000
13	CEO age	0.040	-0.023	-0.075	-0.158	0.157	0.021	0.017	0.004	-0.104	0.108	0.042	0.013
14	CEO tenure	-0.121	-0.042	-0.011	0.020	-0.078	0.065	0.016	0.095	0.041	-0.135	-0.011	-0.106
15	CEO outsider	-0.027	0.012	0.025	0.071	-0.102	0.000	-0.037	0.019	0.138	-0.090	-0.020	-0.037
16	CEO ownership	0.029	-0.025	-0.034	-0.074	-0.024	0.038	-0.018	-0.046	-0.004	-0.038	-0.047	-0.031
17	Chairman	0.012	-0.053	-0.047	-0.012	0.017	-0.061	0.063	0.094	-0.106	0.101	0.022	-0.010
18	Founder	-0.145	-0.012	0.055	0.086	-0.132	0.091	-0.092	0.139	0.226	-0.241	-0.050	-0.055
19	Number of VPs	0.153	0.020	-0.031	-0.136	0.146	0.075	-0.048	-0.096	0.044	0.094	-0.027	0.007
20	Insider ownership	-0.126	-0.010	0.052	-0.003	-0.061	0.003	0.010	-0.014	-0.016	-0.102	0.013	-0.068
21	Appointed	0.029	0.102	0.069	-0.010	0.175	0.045	-0.014	-0.075	-0.023	0.083	-0.014	0.004
22	Independent	0.197	0.118	-0.018	-0.123	0.268	0.025	-0.076	-0.061	0.012	0.269	0.052	0.043
23	Board interlock	-0.017	-0.038	0.004	0.001	-0.029	-0.039	0.024	0.012	-0.034	0.011	0.018	0.038
24	Board size	0.025	0.169	0.136	-0.189	0.507	0.042	-0.066	-0.014	-0.109	0.422	0.077	0.060

Table 2 (Continued)

	Variables	13	14	15	16	17	18	19	20	21	22	23	24
13	CEO age	1.000											
14	CEO tenure	0.356	1.000										
15	CEO outsider	-0.010	0.137	1.000									
16	CEO ownership	0.080	0.233	-0.006	1.000								
17	Chairman	0.063	0.111	-0.049	0.088	1.000							
18	Founder	0.047	0.392	0.131	0.126	0.026	1.000						
19	Number of VPs	-0.009	0.001	-0.044	0.404	0.060	0.009	1.000					
20	Insider ownership	0.016	0.242	0.002	0.463	0.061	0.268	0.097	1.000				
21	Appointed	0.021	0.041	-0.046	0.295	-0.001	-0.037	0.367	0.116	1.000			
22	Independent	0.031	-0.088	0.015	0.180	0.075	-0.049	0.359	-0.009	0.169	1.000		
23	Board interlock	0.049	0.021	0.010	-0.087	0.024	-0.044	-0.146	-0.048	-0.068	-0.231	1.000	
24	Board size	0.119	-0.114	-0.134	-0.119	0.038	-0.127	-0.070	-0.077	0.038	0.065	0.101	1.000

Table 3: Univariate analysis

This table reports CPS and net change in CPS for the current year with different types of negative media tone. Media negative tone is measured by the average ratio of negative-toned words to total words and the median is used to divide our sample of firms into two negative media-tone portfolios for each previous year: low negative tone and high negative tone. We then calculate CPS difference for subsamples for firms basing on median value, and compute net change in CPS from *t-1* to *t*. All variables are defined in Appendix B. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Panel A: CPS			
	Negative media tone		
	Low	High	Low-High
CPS	0.41	0.39	0.02***
			(3.45)
High CPS	0.49	0.48	0.01**
			(2.06)
Low CPS	0.33	0.31	0.02***
			(3.59)
Panel B: Net change in CPS from t-1 to t			
	Negative media tone		
	Low	High	Low-High
Net increase in CPS	6.73%	6.97%	-0.24%
			(-0.64)
Net decrease in CPS	6.67%	7.54%	-0.87%**
			(-1.94)

Table 4: Media tone and CPS

This table reports the panel regression of CPS on negative tone. Following Loughran and McDonald (2011), Negtone is defined as the negative tone computed as the average ratio of negative-toned words to total words. Control variables include Number of articles, firm-specific and CEO-specific variables. Firm-specific variables include Industry-adjusted Tobin's Q, Firm size, Leverage, ROA, Company age, and Diversified. CEO-specific variables include Relative equity, CEO age, CEO tenure, and CEO outsider. Governance control variables include CEO ownership, Chairman, Founder, Number of VPs, Insider ownership, Appointed, Independent, Board interlock, and Board size. All control variables are measured at time *t-1*. The models are fitted using firm fixed-effects regressions based on robust standard errors clustered at the firm level. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)
	CPS_t	
Negtone	-0.008***	-0.007***
	(-3.893)	(-3.259)
Number of articles	-0.000	-0.000
	(-0.887)	(-1.037)
Industry-adjusted Tobin's Q	0.001	0.001
	(0.253)	(0.308)
Firm size	-0.006	-0.008
	(-0.853)	(-0.905)
Leverage	-0.014	-0.011
	(-1.344)	(-0.999)
ROA	0.043	0.030
	(0.930)	(0.577)
Capex/assets	0.057	-0.003
	(0.775)	(-0.044)
R&D	0.025	0.019
	(1.199)	(0.797)
Company age	0.004***	0.002*
	(4.688)	(1.768)
Diversified	0.012	0.010
	(1.008)	(0.747)
Relative equity	0.005	0.004
	(1.002)	(0.745)
CEO age	-0.001	-0.001
	(-1.319)	(-1.183)
CEO tenure	-0.001	-0.001
	(-0.995)	(-1.153)
CEO outsider	-0.004	-0.005
	(-0.282)	(-0.340)
Constant	0.347***	0.431***
	(5.244)	(5.091)
Observations	3,690	3,038
R-squared	0.055	0.054
Firm fixed effects	YES	YES
Year fixed effects	YES	YES
Governance control variables	NO	YES

Table 5: Media tone and internal corporate governance

This table reports the panel regression of the CPS on negative tone based on subsample analysis of firms with internal corporate governance mechanisms. Governance index consists of four governance indicators (including board size, independent directors, CEO duality, and key subordinate executives' horizon) that are related with internal corporate governance mechanism. Columns 2 and 4 include governance variables but exclude Chairman, Independent, and Board size. All independent variables and control variables are measured at time *t-1*. The models are fitted using firm fixed-effects regressions based on robust standard errors clustered at the firm level. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)	(3)	(4)
	CPS_t			
	Poor internal governance		Good internal governance	
Negtone	0.002	0.003	-0.010***	-0.010***
	(0.513)	(0.807)	(-4.245)	(-3.593)
Number of articles	-0.001	-0.001	0.000	0.000
	(-1.504)	(-1.580)	(0.709)	(0.484)
Industry-adjusted Tobin's Q	0.001	-0.000	-0.000	-0.000
	(0.111)	(-0.043)	(-0.096)	(-0.115)
Firm size	-0.002	0.004	-0.004	-0.010
	(-0.152)	(0.256)	(-0.483)	(-0.852)
Leverage	-0.007	-0.006	-0.015	-0.020*
	(-0.359)	(-0.258)	(-1.434)	(-1.657)
ROA	-0.035	-0.080	0.076*	0.077
	(-0.394)	(-0.950)	(1.739)	(1.534)
Capex/asset	0.079	0.129	0.074	-0.076
	(0.771)	(1.143)	(0.789)	(-0.613)
R&D	0.013	0.012	0.036**	0.042*
	(0.321)	(0.195)	(1.973)	(1.790)
Company age	0.005**	0.004	0.004***	0.002*
	(2.009)	(1.135)	(3.982)	(1.692)
Diversified	-0.000	-0.008	0.011	0.006
	(-0.022)	(-0.337)	(0.797)	(0.387)
Relative equity	-0.005	-0.004	0.014**	0.013**
	(-1.177)	(-0.905)	(2.444)	(2.103)
CEO age	-0.001	-0.002	-0.001	-0.000
	(-0.563)	(-1.124)	(-0.910)	(-0.573)
CEO tenure	-0.001	-0.001	-0.000	-0.001
	(-0.891)	(-0.363)	(-0.280)	(-0.617)
CEO outsider	0.081***	0.088***	-0.009	-0.011
	(3.604)	(3.195)	(-0.667)	(-0.725)
Constant	0.326**	0.358**	0.303***	0.400***
	(2.353)	(2.476)	(4.372)	(3.824)
Observations	1,079	990	2,611	2,048
R-squared	0.077	0.081	0.070	0.075
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Governance control variables	NO	YES	NO	YES

Table 6: The association between media tone and CPS by instrumental variable estimations

This table presents regression results for the 2SLS analysis. Columns 1 to 2 report the results of the first-stage pooled OLS regression when using Negtone as the dependent variable. Location is a dummy variable equal to one if both the firms and the headquarters of media outlets are located in the same state, zero otherwise. Columns 3 to 4 present the second-stage regression on predicted Negtone. Control variables include Number of articles, firm-specific and CEO-specific variables, and governance variables. T-statistics (in parentheses) are based on robust standard errors, clustered at the firm level. All independent variables and control variables are measured at time *t-1*. All variables are as defined in Appendix B. All regressions include firm and year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively.

Variables	First-stage		Second-stage	
	(1)	(2)	(3)	(4)
	Negtone		CPS_t	
Location	-0.197**	-0.185**		
	(-2.510)	(-2.086)		
Negtone			-0.604***	-0.632***
			(-14.131)	(-10.635)
Number of articles	0.008***	0.009***	0.005***	0.005***
	(4.248)	(4.328)	(10.563)	(7.944)
Industry-adjusted Tobin's Q	-0.025*	-0.021	-0.014***	-0.012**
	(-1.802)	(-1.441)	(-3.379)	(-2.324)
Firm size	0.118**	0.063	0.065***	0.031***
	(2.588)	(1.044)	(5.807)	(2.622)
Leverage	0.011	0.056	-0.007	0.024*
	(0.219)	(0.986)	(-0.688)	(1.966)
ROA	-1.144***	-1.448***	-0.639***	-0.876***
	(-3.296)	(-3.556)	(-10.518)	(-9.830)
Capex/assets	0.653	0.841	0.447***	0.523***
	(1.498)	(1.419)	(5.413)	(5.218)
R&D	0.079	-0.094	0.072***	-0.040
	(0.664)	(-0.548)	(3.384)	(-1.594)
Company age	-0.007***	-0.012***	0.014***	0.009***
	(-3.943)	(-3.556)	(20.937)	(6.208)
Diversified	-0.011	0.047	0.005	0.040***
	(-0.122)	(0.452)	(0.447)	(2.790)
Relative equity	0.004	0.006	0.008	0.008
	(0.209)	(0.266)	(1.528)	(1.485)
CEO age	-0.013***	-0.016***	-0.009***	-0.011***
	(-3.071)	(-3.028)	(-10.885)	(-9.666)
CEO tenure	0.004	0.006	0.002**	0.003***
	(0.985)	(1.100)	(2.420)	(3.101)
CEO outsider	-0.036	-0.047	-0.025*	-0.034**
	(-0.421)	(-0.473)	(-1.914)	(-2.270)
Constant	1.041**	1.336**	0.410***	0.803***
	(2.335)	(2.186)	(6.351)	(10.889)
Observations	3,905	3,212	3,690	3,038
R-squared	0.390	0.413	0.052	0.051
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Governance control variables	NO	YES	NO	YES

Table 7: Media tone and CPS: pre-2006 versus post-2006 periods

This table reports the regression of CPS on negative tone in the 1996–2005 (Columns 1 and 2) and 2007–2014 periods (Columns 3 and 4), respectively. Control variables include Number of articles, firm-specific and CEO-specific variables, and governance control variables. All independent variables and control variables are measured at time *t-1*. The models are fitted using firm fixed-effects regressions based on robust standard errors clustered at the firm level. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)	(3)	(4)
	CPS_t			
	Year<2006		Year>2006	
Negtone	-0.007**	-0.003	-0.007***	-0.007***
	(-2.327)	(-0.963)	(-2.874)	(-2.639)
Number of articles	-0.000	-0.000	0.000	0.001
	(-0.667)	(-0.012)	(1.470)	(1.233)
Industry-adjusted Tobin's Q	-0.001	-0.000	0.000	-0.004
	(-0.470)	(-0.081)	(0.015)	(-0.713)
Firm size	-0.007	-0.010	-0.014	-0.016
	(-0.787)	(-0.644)	(-1.294)	(-1.187)
Leverage	-0.013	-0.009	-0.008	-0.008
	(-1.171)	(-0.722)	(-0.605)	(-0.572)
ROA	0.054	0.113	0.044	0.042
	(0.634)	(1.428)	(0.964)	(0.794)
Capex/assets	0.143*	0.036	-0.153	-0.081
	(1.659)	(0.311)	(-1.518)	(-0.687)
R&D	0.036	0.029	-0.009	-0.021
	(1.638)	(1.100)	(-0.385)	(-0.838)
Company age	0.008***	0.006***	0.003**	0.002
	(5.164)	(2.768)	(2.298)	(0.765)
Diversified	0.007	-0.002	0.013	0.019
	(0.369)	(-0.080)	(1.312)	(1.635)
Relative equity	0.002	-0.000	-0.003	-0.002
	(0.418)	(-0.070)	(-0.504)	(-0.298)
CEO age	-0.001	-0.001	-0.001	0.000
	(-1.273)	(-0.440)	(-1.412)	(0.065)
CEO tenure	0.000	0.000	0.001	0.000
	(0.013)	(0.062)	(0.591)	(0.183)
CEO outsider	0.029	0.042**	0.025	0.001
	(1.622)	(2.128)	(1.015)	(0.046)
Constant	0.262***	0.297**	0.500***	0.540***
	(2.850)	(2.243)	(4.387)	(3.468)
Observations	1,669	1,285	2,021	1,753
R-squared	0.045	0.047	0.028	0.038
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Governance control variables	NO	YES	NO	YES

Table 8: Firm without media coverage

This table reports the regression of CPS on negative tone. In Column 1 and 2, for each year, we set negative tone to the average negative tone in the two-digit SIC group if the firm is without media press coverage. In Column 3 and 4, we omit firms without media coverage. Control variables include Number of articles, firm-specific and CEO-specific variables, and governance control variables. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)	(3)	(4)
	CPS_t			
Negtone	-0.009***	-0.008***	-0.010***	-0.009***
	(-3.604)	(-3.259)	(-3.540)	(-2.892)
Number of articles	-0.000	-0.000	0.000	-0.000
	(-0.935)	(-1.093)	(0.026)	(-0.392)
Industry-adjusted Tobin's Q	0.001	0.001	0.001	0.001
	(0.254)	(0.279)	(0.146)	(0.160)
Firm size	-0.006	-0.008	-0.015	-0.022
	(-0.909)	(-0.853)	(-1.367)	(-1.584)
Leverage	-0.014	-0.012	-0.026*	-0.027
	(-1.333)	(-1.019)	(-1.828)	(-1.374)
ROA	0.043	0.031	0.024	0.003
	(0.922)	(0.606)	(0.346)	(0.046)
Capex/assets	0.059	-0.005	0.034	-0.099
	(0.801)	(-0.058)	(0.340)	(-0.969)
R&D	0.025	0.021	0.043	0.047
	(1.209)	(0.867)	(1.626)	(1.165)
Company age	0.004***	0.002*	0.003***	0.003
	(4.757)	(1.810)	(2.605)	(1.453)
Diversified	0.012	0.011	0.012	0.019
	(1.006)	(0.796)	(0.738)	(1.056)
Relative equity	0.005	0.004	0.009	0.005
	(1.000)	(0.732)	(1.400)	(0.709)
CEO age	-0.001	-0.001	-0.001	-0.001
	(-1.277)	(-1.142)	(-0.934)	(-0.829)
CEO tenure	-0.001	-0.001	-0.001	-0.001
	(-1.027)	(-1.244)	(-0.614)	(-1.009)
CEO outsider	-0.004	-0.006	-0.023	-0.029
	(-0.286)	(-0.359)	(-1.246)	(-1.269)
Constant	0.349***	0.429***	0.465***	0.556***
	(5.283)	(5.012)	(4.499)	(4.187)
Observations	3,690	3,038	2,386	1,978
R-squared	0.055	0.055	0.048	0.054
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Governance control variables	NO	YES	NO	YES

Table 9: The effects of positive favorability on CPS

This table reports the regression of CPS on positive favorability in media coverage. We measure positive favorability using the difference between number of positive words and number of negative words in articles to divide by number of total words. Control variables include Number of articles, firm-specific and CEO-specific variables, and governance control variables. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)
	CPS_t	
Positive favorability	0.006***	0.006***
	(3.255)	(2.815)
Number of articles	-0.000	-0.000
	(-0.941)	(-1.112)
Industry-adjusted Tobin's Q	0.001	0.001
	(0.267)	(0.292)
Firm size	-0.006	-0.008
	(-0.858)	(-0.839)
Leverage	-0.014	-0.012
	(-1.327)	(-1.032)
ROA	0.045	0.034
	(0.967)	(0.651)
Capex/assets	0.058	-0.004
	(0.791)	(-0.053)
R&D	0.025	0.021
	(1.171)	(0.848)
Company age	0.004***	0.002
	(4.369)	(1.601)
Diversified	0.013	0.011
	(1.044)	(0.826)
Relative equity	0.005	0.004
	(1.008)	(0.738)
CEO age	-0.001	-0.001
	(-1.321)	(-1.179)
CEO tenure	-0.001	-0.001
	(-0.981)	(-1.199)
CEO outsider	-0.004	-0.005
	(-0.282)	(-0.351)
Constant	0.351***	0.431***
	(5.314)	(5.037)
Observations	3,690	3,038
R-squared	0.054	0.054
Firm fixed effects	YES	YES
Year fixed effects	YES	YES
Governance control variables	NO	YES

Table 10: Positive favorability and internal corporate governance

This table reports the regression of CPS on positive favorability under internal corporate governance. Control variables include Number of articles, firm-specific and CEO-specific variables, and governance control variables. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)	(3)	(4)
	CPS_t			
	Poor internal governance		Good internal governance	
Positive favorability	-0.003	-0.004	0.009***	0.009***
	(-0.661)	(-0.943)	(3.695)	(3.221)
Number of articles	-0.001	-0.001	0.000	0.000
	(-1.504)	(-1.578)	(0.641)	(0.449)
Industry-adjusted Tobin's Q	0.001	-0.000	-0.000	-0.000
	(0.117)	(-0.035)	(-0.067)	(-0.085)
Firm size	-0.003	0.004	-0.004	-0.010
	(-0.155)	(0.252)	(-0.492)	(-0.833)
Leverage	-0.007	-0.006	-0.015	-0.020
	(-0.355)	(-0.256)	(-1.415)	(-1.628)
ROA	-0.035	-0.080	0.078*	0.079
	(-0.394)	(-0.952)	(1.784)	(1.585)
Capex/assets	0.078	0.128	0.078	-0.070
	(0.769)	(1.147)	(0.832)	(-0.566)
R&D	0.013	0.012	0.036*	0.042*
	(0.324)	(0.201)	(1.921)	(1.756)
Company age	0.005**	0.004	0.004***	0.002
	(2.043)	(1.179)	(3.588)	(1.388)
Diversified	-0.001	-0.008	0.012	0.007
	(-0.034)	(-0.353)	(0.824)	(0.413)
Relative equity	-0.005	-0.004	0.014**	0.013**
	(-1.182)	(-0.910)	(2.442)	(2.101)
CEO age	-0.001	-0.002	-0.001	-0.000
	(-0.557)	(-1.109)	(-0.905)	(-0.588)
CEO tenure	-0.001	-0.001	-0.000	-0.001
	(-0.889)	(-0.362)	(-0.247)	(-0.573)
CEO outsider	0.081***	0.088***	-0.009	-0.012
	(3.609)	(3.195)	(-0.663)	(-0.736)
Constant	0.324**	0.354**	0.311***	0.408***
	(2.339)	(2.445)	(4.478)	(3.915)
Observations	1,079	990	2,611	2,048
R-squared	0.077	0.081	0.068	0.073
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Governance control variables	NO	YES	NO	YES

Table 11: clustering by the CEO-firm combination: media tone and CPS

This table reports the panel regression of CPS on negative tone. Control variables include Number of articles, firm-specific and CEO-specific variables, and governance control variables. All independent variables and control variables are measured at time *t-1*. The models are fitted using firm fixed-effects regressions based on robust standard errors clustered at the CEO-firm level. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)
	CPS_t	
Negtone	-0.007***	-0.005**
	(-3.458)	(-2.396)
Number of articles	0.000	0.000
	(0.051)	(0.214)
Industry-adjusted Tobin's Q	0.001	0.002
	(0.258)	(0.396)
Firm size	-0.006	-0.001
	(-0.633)	(-0.084)
Leverage	-0.015*	-0.015
	(-1.651)	(-1.354)
ROA	0.079	0.097*
	(1.507)	(1.927)
Capex/asset	0.083	0.056
	(1.331)	(0.765)
R&D	0.038*	0.039
	(1.774)	(1.483)
Company age	0.020	0.020
	(1.109)	(1.036)
Diversified	0.003	0.005
	(0.207)	(0.391)
Constant	0.293	0.534**
	(1.411)	(2.161)
Observations	3,690	3,038
R-squared	0.023	0.026
Firm fixed effects	YES	YES
Year fixed effects	YES	YES
CEO-specific variables	YES	YES
Governance control variables	NO	YES

Table 12: clustering by the CEO-firm combination: media tone and internal corporate governance

This table reports the panel regression of the CPS on negative tone based on subsample analysis of firms with internal corporate governance mechanisms. Control variables include Number of articles, firm-specific and CEO-specific variables, and governance control variables. All independent variables and control variables are measured at time *t-1*. The models are fitted using firm fixed-effects regressions based on robust standard errors clustered at the CEO-firm level. The variables are as defined in Appendix B. All regressions include year fixed effects. ***, ** and * represent significance at the 1%, 5%, and 10% level, respectively. T-statistics are reported in parentheses.

Variables	(1)	(2)	(3)	(4)
	CPS_t			
	Poor internal governance		Good internal governance	
Negtone	0.003	0.005	-0.010***	-0.008***
	(0.826)	(1.407)	(-4.133)	(-3.205)
Number of articles	-0.001	-0.001	0.000	0.000
	(-1.158)	(-1.210)	(0.704)	(0.954)
Industry-adjusted Tobin's Q	0.000	-0.003	-0.001	-0.001
	(0.012)	(-0.379)	(-0.278)	(-0.204)
Firm size	0.003	0.019	0.005	0.010
	(0.113)	(0.787)	(0.515)	(0.544)
Leverage	-0.012	-0.011	-0.019**	-0.022**
	(-0.573)	(-0.425)	(-2.141)	(-2.056)
ROA	-0.074	-0.128	0.077	0.116**
	(-0.708)	(-1.379)	(1.642)	(2.304)
Capex/asset	0.091	0.137	0.086	-0.006
	(0.842)	(1.181)	(0.962)	(-0.044)
R&D	0.022	0.018	0.044**	0.047*
	(0.450)	(0.274)	(2.144)	(1.837)
Company age	0.018	0.014	-0.011	-0.005
	(0.750)	(0.580)	(-0.638)	(-0.247)
Diversified	-0.003	-0.006	0.002	0.014
	(-0.099)	(-0.214)	(0.134)	(0.886)
Constant	0.764	0.722	0.174	0.380
	(1.146)	(1.063)	(0.749)	(1.422)
Observations	1,079	990	2,611	2,048
R-squared	0.037	0.048	0.035	0.038
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
CEO-specific variables	YES	YES	YES	YES
Governance control variables	NO	YES	NO	YES