Journal of Contemporary Accounting and Economics 19 (2023) 100353

Contents lists available at ScienceDirect

Journal of Contemporary Accounting and Economics

journal homepage: www.elsevier.com/locate/jcae

Tournament-based incentives and media sentiment

Jiayi Zheng [a], Hasibul Chowdhury [b], Md Safayat Hossain [c], Kartick Gupta [d,*]

[a] College of Business and Economics, Australian National University, Australia
[b] UQ Business School, The University of Queensland, Australia
[c] Peter T. Paul College of Business and Economics, University of New Hampshire, USA
[d] University of South Australia, Australia

ARTICLE INFO

Article history:
Received 23 December 2021
Revised 11 September 2022
Accepted 30 November 2022
Available online 13 March 2023

Keywords:
Tournament-based incentives
Media sentiment
Promotion-based tournament
Corporate branding

ABSTRACT

We find that promotion-based tournament incentives of executives are positively associated with firms' media sentiment. This effect is more pronounced among firms with greater need for media favourability, captured by higher information opacity, lower analyst coverage, lower industry homogeneity, lower investment sentiment and lower managerial ability. Furthermore, we identify better financial performance and higher corporate branding as two channels through which tournament incentives can enhance a firm's positive media sentiment. Our results are also robust to two quasi-natural experiments affecting promotion-based tournaments – (a) an exogenous CEO turnover due to health issues or sudden CEO death, and (b) the implementation of Say-on-Pay (SOP) law. Overall, our findings indicate that tournament-based incentives encourage a firm's executives to showcase their skills to broader stakeholders, which consequently increases a firm's media image.

1. Introduction

Business press plays an essential role in providing information of firms' fundamental value to financial markets (i.e., Bushee et al., 2010, Drake et al., 2014) and shaping firms' information environment (i.e., Engelberg and Parsons, 2011; Dougal et al., 2012). While studies examining the impact of media coverage on the information environment mostly assume it is exogenous, a growing number of studies find that firms might have active endeavours to improve their media image (Ahern and Sosyura, 2014; Solomon, 2012). Nevertheless, these studies mainly focus on how a CEO's incentives may contribute to a firm's media image (Falato et al., 2015), little attention has been devoted to understanding whether other executives also can affect a firm's positive media reputation. In this study, we fill this gap by examining whether promotion-based tournament incentives of executives in a firm can influence media sentiment.

Prior literature suggests that tournament-based incentives have a significant impact on corporate policies. For example, it can encourage senior executives to undertake riskier projects, resulting in higher firm leverage (Kini and Williams, 2012), a better innovation efficiency (Shen and Zhang, 2017), a higher level of cash-holding (Phan et al., 2017) and a higher implied cost of equity (Chen et al., 2013). Furthermore, acknowledging these impacts, firms increase tournament incentives during growth and mature stages of firm life cycle (Chowdhury and Shams, 2021). In addition, tournament-based incentives allow executives to compete efficiently even without being monitored. In comparison with the wage compensation, such option-like rank-order tournaments may better encourage executives to expend their efforts (Lazear and Rosen, 1981).

* Corresponding author.
E-mail addresses: jiayi.zheng1@anu.edu.au (J. Zheng), h.chowdhury@business.uq.edu.au (H. Chowdhury), mdsafayat.hossain@unh.edu (M.S. Hossain), kartick.gupta@unisa.edu.au (K. Gupta).

https://doi.org/10.1016/j.jcae.2023.100353
1815-5669/

Tournament-based incentives may have two opposite impacts on firms' media sentiment. On one hand, the "efficiency perspective" of tournament-based incentives (Kale et al., 2009; Kini and Williams, 2012) posits that tournament-based incentives encourage other executives to put their best efforts for the firm while they are competing for the CEO's position and the CEO is also motivated to work harder to achieve firm goals due to monitoring pressure by other executives. These combined endeavours of all executives can improve overall firm value and performance. Indeed, prior studies show that tournament-based incentives are more efficient in encouraging executives to input their efforts in comparison to the compensation contracts (Lazear and Rosen, 1981; Murphy, 1999). Such promotion-based incentives not only induce greater effort but also increase these executives' willingness to showcase their skills in order to improve labour market value with a better reputation. As documented by prior literature, media coverage helps shape executives' reputation (Core et al., 2008), which, in turn, can increase their labour market visibility within and outside of the firm. Therefore, executives with promotion-based tournament incentives can have strong motivation to create a sustainable corporate branding through highlighting their contributions to the firm and shirking any unpleasant activity that might reduce their market reputation, which collectively could increase positive media reporting about the firm. Overall, the "efficiency perspective" predicts that favourable media reporting for a firm will increase with executives' tournament-based incentives.

On the other hand, the "agency problem perspective" of tournament-based incentives suggests that while promotion tournament encourages executives to provide greater efforts, it might also induce managerial wrongdoing (Cheng, 2011; Haβ et al., 2015; Bainbridge, 2005; Shi et al., 2016). Specifically, due to the promotion and compensation concerns, executives with greater tournament-based incentives might engage in unethical behaviour to increase their chances of winning the CEO position. Once these behaviours have been found out by the press, the media image of the firm might deteriorate. Therefore, the "agency problem perspective" of tournament predicts that there could be a negative association between tournament incentives and media sentiment. Since we cannot have an *ex-ante* clear prediction of the relationship between tournament incentives and media sentiment, it remains an empirical question as to whether executives' tournament-based incentive help improve or diminish firms' media reputation.

To examine the impact of tournament-based incentives on firms' media image, we regress media sentiment on executives' tournament-based incentives. We measure media sentiment using press-initiated net positive sentiment for a firm, following Cahan et al. (2015) and Gurun and Butler (2012). The net positive sentiment is calculated as the total positive sentiment news less the total negative sentiment news for the year t scaled by the total number of news items. Regarding the tournament-based incentives, we define it as the natural logarithm of the pay gap between the CEO's total compensation and the median value of other executives' total compensation. Using a sample of US public firms from 2002 to 2014, we find a positive and significant relationship between tournament-based incentives and media sentiment, supporting "efficiency perspective" of tournament-based incentives. This finding is robust to the use of firm fixed effects model and changes regression model.

To further address the endogeneity issues potentially caused by functional form misspecification, correlated omitted variable bias, systematic differences among firms with high and low tournament incentives, and reverse causality bias, we conduct five robustness tests. First, using exogenous CEO turnovers due to the CEO's health condition or sudden death, we design a quasi-natural experiment with a difference-in-differences framework that suggests possible causal relation between tournament incentives and a firm's high media visibility. Specifically, we define firms with exogenous CEO turnovers as treatment firms and match each of them based on year, industry and firm-specific characteristics with a corresponding control firm that does not experience any exogenous CEO turnover during our sample period. Given that the probability of winning a tournament gets higher at the time of the availability of the firm's CEO position, the exogenous CEO turnover event can be viewed as a positive shock to executives' tournament incentives. Therefore, by exploiting the impact of exogenous CEO turnover on firms' media sentiment, we examine the causal link between executives' tournament incentives and media sentiment.

Second, we also employ the implementation of the Say-on-Pay law (SOP) as an exogenous negative shock to executives' tournament incentives since it is associated with a decrease in the pay gap between CEO and executive and thereby reduces the tournament incentives of executives. We show that firms with above-average executives' tournament incentives experience a stronger decrease in media sentiment following the implementation of SOP. This finding concurs with the view that such firms experience a greater decrease in tournament incentives following the implementation of SOP, which consequently results in a decrease in corporate media sentiment.

Third, using a propensity score matching (PSM) analysis, we find that our main results remain robust to functional form misspecification and systematic differences among firm characteristics. Fourth, we conduct a two-stage least squares (2SLS) analysis, employing the industry median value of pay gap as the instrumental variable (IV) following Shen and Zhang (2017). Our baseline result holds in the 2SLS analysis. Fifth, we apply a two-step system GMM model to alleviate concerns of omitted variable biases and unobserved heterogeneity in our sample. Our baseline results remain consistent. Overall, these robustness tests suggest that our baseline finding is less likely to suffer from endogeneity concerns.

Next, as a part of a sensitivity test, we examine the effect of non-competition agreement on the association between tournament incentives and media sentiment. If the tournament-based incentives can indeed improve corporate media sentiment, we expect the positive relationship to be more pronounced among firms located in states with stricter non-competition enforcement. Since non-competition agreements prevent workers from joining a rival firm, increased enforceability of the agreements would reduce executives' mobility (Garmaise, 2009). As such, executives of firms in states with stricter non-competition enforcement are less likely to seek external promotion with better career opportunities. Hence,

executives of these firms would then have greater incentives to obtain an internal promotion by showcasing their skills to improve their labour market value with a better reputation, resulting in an improved media sentiment. Consistent with this argument, we find that the positive effect of tournament-based incentives on media sentiment is more pronounced among firms headquartered in states with stricter enforcement of non-competition agreement.

Next, we examine whether firms with greater needs for media favourability experience more pronounced effects of tournament incentives on media sentiment. Specifically, we find that firms with higher opacity are in greater need of enhancing their media sentiment. Consequently, firms with a higher degree of information opacity and lower analyst coverage have more pronounced impact of tournament incentives on media reportage. Furthermore, we argue that executives in heterogeneous industries enjoy greater incentives to showcase their skills to improve labour market value with a better reputation. Consistent with our conjecture, we find that the effect of tournament incentives on improving a firm's public media image is more pronounced for firms with low industry homogeneity. Similarly, firms facing lower external investor sentiment are in higher need of enhancing the media favourability to counteract the overall pessimistic outlook. Supporting this view, we find that the impact of tournament incentives on media favourability is more pronounced among firms with lower investor sentiment. As less talented CEOs (low managerial ability) are more likely to be replaced by a better candidate, intensifying the severity of internal competition rivalry, other executives might have higher motivations to compete for the CEO position by showcasing their skills and highlighting their contributions through managing a better media image. Moreover, firms with low managerial ability are also in higher requirements to enhance their public image. Consistent with this argument, we find that the positive relation between tournament incentives and media sentiment is more pronounced for firms with low managerial ability. Collectively, these findings are consistent with the notion that tournament incentives have stronger impact on a firm's media sentiment when a firm has a greater need for a positive public image.

Finally, we empirically examine the possible channels by which tournament incentives can affect media sentiment and firm-level implications of tournament-sentiment associations. Specifically, we explore whether tournament incentives impact firms' positive media image through agency problem mitigation with a contribution to firm valuation and overall corporate branding and, thereby, directly disproving "agency problem perspective" of tournament. To this extent, we find that tournament incentives, indeed, affect favourable media reporting by improving financial performance (measured by return on equity) and by creating a sustainable brand value for the firm. Furthermore, we show that the positive association between tournament incentives and media sentiment can actually enhance a firm's information dissemination and equity valuation by reducing cost of equity.

Our study contributes to the literature in two important ways. First, we enrich the media sentiment literature by presenting empirical evidence that demonstrates the value creation role of tournament-based incentives in improving firms' media sentiment. To the best of our knowledge, our study is the first of its kind to empirically examine the importance of senior executives' tournament-based incentives for firms' public image. Second, our study contributes to an emerging line of research that studies the impact of tournament-based incentives. While proponents find that tournament-based incentives encourage senior executives to exert greater effort, which consequently improves firm performance (Lazear and Rosen, 1981; Prendergast, 1999; Kale et al., 2009), non-advocates show that such incentives may increase managerial wrongdoing (Cheng, 2011; Haβ et al., 2015; Bainbridge, 2005). We find evidence supporting the positive role of tournament-based incentives in improving firms' public image. Our study also has a practical implication for compensation committees, suggesting that boards can improve firms' public images by encouraging executives' promotion tournaments. Furthermore, our study shows that promotion-based tournaments can mitigate information uncertainty and improve a firm's overall information environment by helping the firm to build a better media image.

The remainder of this paper is structured in the following way. Section 2 reviews the relevant literature and develops the hypothesis. Section 3 describes the data and methodology employed in our empirical analysis. Section 4 reports the main results and robustness tests. Section 5 provides additional analyses, and Section 6 concludes.

2. Literature review and hypothesis development

2.1. Managerial incentives and media sentiment

A growing body of research focuses on the role of media as an information intermediary (e.g., Fang and Peress, 2009; Engelberg and Parsons, 2011). Specifically, studies look at two important roles of media in the modern business environment: (a) information dissemination role – how media disseminates firm-specific information more broadly, and (b) an information creation role – how media produces new information for market participants (Drake et al., 2014). Studies report that media coverage affects stock price formation by reducing informational frictions (Fang and Peress, 2009; Bushee et al., 2010; Peress, 2014), cash flow mispricing (Drake et al., 2014), and thereby enhancing trading activities around earnings announcements (Engelberg and Parsons, 2011). In addition, positive (negative) media coverage decreases (increases) firms' cost of capital, and investors demand a return premium for firms with low/no media coverage (Kothari et al. 2009). Also, media coverage is positively associated with corporate governance reforms (Dyck et al. 2008), negatively associated with insiders' future trading profits (Dai et al., 2015), and negatively associated with earnings management (Chen et al., 2020).

While research documents how media coverage impacts the information environment of a firm, only a few studies provide evidence on how a firm's action may influence its media image (Ahern and Sosyura, 2014; Gurun and Bulter, 2012;

Solomon, 2012). For example, Solomon (2012) finds that investor relations (IR) firms deliberately create more positive media coverage to increase announcement returns. Ahern and Sosyura (2014) propose that bidders in stock mergers originate more news stories after the start of merger negotiations, but before the public announcement to obtain a better takeover price. Similarly, Cahan et al. (2015) find that firms, engaged in corporate social responsivity, receive favourable media coverage. While these studies on media coverage suggest that media image can be influenced by corporate actions, no study examines the impact of tournament incentives on corporate media sentiment.

2.2. Tournament-based incentives and media sentiment

An optimal compensation system can mitigate agency problem. Particularly, if a properly designed compensation system rewards executives for the risks that they take, apparent costs of agency conflicts can be reduced (Jensen and Murphy, 1990). While theoretical aspects provide a positive association between executive compensation and firm performance, empirical evidence shows mixed results (Aggarwal and Samwick, 2006; Conyon and He, 2011; Brick et al., 2006). A possible explanation for the mixed findings is that the wage contract mainly compensates for the absolute level of one's output. Since the difference in the level of output between individuals is relatively small, the wage contract may not provide enough incentives for executives to allocate their effort efficiently (Lazear and Rosen, 1981). To counter this problem, rank-order tournament, a compensation structure widely used by corporations, is designed to encourage senior executives to input greater efforts (Lazear and Rosen, 1981; Murphy, 1999).

In a tournament-like structure, senior executives compete for the CEO position and are evaluated relative to their peers. Promotion to the CEO position thus provides senior executives stronger incentives to exert greater effort, which consequently improves firm performance (Lazear and Rosen, 1981; Prendergast, 1999). Moreover, monitoring pressure from the executives also constrains CEOs from any wrongdoing, which can potentially reduce a firm's reputation and CEO dismissal (Li, 2014). Studies further suggest that such option-like tournaments provide managers career-enhancing incentives to implement risky yet value-enhancing firm policies (Kale et al., 2009; Kini and Williams, 2012). Overall, promotion-based incentives encourage both greater efforts and executives' willingness to showcase their skills in order to improve labour market value with a better reputation. Interestingly, as evidenced in extant literature, media's favourable reporting could help shape executives' reputation (Core et al., 2008), which, in turn, can increase their labour market visibility within and outside of the firm. Taken together, executives with promotion-based tournament incentives can have strong motivation to build a sustainable positive corporate brand. This is achieved by highlighting their contributions to the firm and shirking any unpleasant activity that might destroy their market reputation, which collectively could increase positive media reporting about the firm. On these grounds, the "efficiency perspective" predicts that favourable media reporting for a firm will increase with executives' tournament-based incentives. Therefore, our first hypothesis is:

H1: *Tournament-based incentives are positively associated with media sentiment.*

However, the "agency problem perspective" of tournament-based incentives suggests that executives' promotion tournament might encourage managerial wrongdoing, eroding the positive image brought by executives' efforts. Although an apparent benefit of tournament incentive is to encourage greater managerial efforts, a stream of research has also identified several unintended dysfunctional consequences. For example, managers tempted by promotion and compensation concerns may engage in egregious behaviour due to promotion and compensation concerns and could turn competition into the seeds of managerial wrongdoing. In line with this argument, studies find that executives try to manipulate their abilities to increase their chance of promotion and thus are more likely to misstate the financial statements (Cheng, 2011), engage in financial frauds (Haβ et al., 2015), resort to unethical behaviour (Bainbridge, 2005) and increase stock price crash risk through higher bad news hoarding (Jia, 2018). Tournament incentive is also positively associated with the propensity of a securities class action lawsuit (Shi et al., 2016). Media, being the watchdog, undertakes original investigations and rebroadcasts information from other sources. In addition, media caters to consumers and aim at attracting readers by focusing more on attention-seeking stories that boost subscription. Financial misrepresentation, accounting fraud or any potential lawsuit are thus widely covered and extensively discussed in the media. As a result, negative outcomes of tournament incentives are more likely to be reported in the media, and, hence, the "agency problem perspective" of tournament predicts that there could be a negative association between tournament incentives and media sentiment. Thus, our second hypothesis is:

H2: *Tournament-based incentives are negatively associated with media sentiment.*

3. Data and methodology

This section discusses data sources, the baseline model we employed in the empirical analysis and the descriptive statistics of the data.

3.1. Data and sample selection

To examine the impact of executives' tournament-based incentives (TI) on the firm's media sentiment, we construct our sample of US firms with an intersection between Thomson Reuters News Analytics (TRNA), Compustat, CRSP, and ExecuComp for the period 2002–2014. We remove firm-year observations with any missing observations. We further exclude

firms operating in the financial industry (SIC codes 6000–6999) and regulated utilities (SIC codes 4900–4999) because they are subject to a different financial accounting process and are more regulated than others. The final sample contains 7,368 firm-year observations over the period from 2002 to 2014. Panel A of Table 1 presents our sample selection process in detail.

Panel B of Table 1 reports the final sample distribution by year. We have the highest number of firm-year observations in 2011 (713), accounting for 9.68 % of the total sample. In contrast, the lowest number of firm-year observations appears in the year 2002 (54), representing only 0.73 % of our final sample. Panel C of Table 1 shows the industry distribution of our sample with Fama-French 30 industry classification. Business Equipment (13.90 %) has the highest portion of our sample observations, followed by Personal and Business Services (13.10 %) and Healthcare, Medical Equipment, Pharmaceutical Products (10.80 %). Coal industry has the lowest portion of our sample observations, which occupied only 0.05 % of our sample observations.

3.2. Empirical models

To examine the relationship between tournament-based incentives and media sentiment, we estimate the following baseline regression model:

$$SENT_{i,t} = \beta_1 TI_{i,t} + \beta_2 RET_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 BM_{i,t} + \beta_5 ROA_{i,t} + \beta_6 LEV_{i,t} + \beta_7 ADV_{i,t} + \beta_8 TNEWS_{i,t} + \beta_9 SENTF_{i,t} + \beta_{10} INDHOMO_{i,t} + \beta_{11} TENURE_{i,t} + \beta_{12} CEODIR_{i,t} + \beta_{13} DELTA_{i,t} + \beta_{14} VEGA_{i,t} + YearFE + IndustryFE + \varepsilon_{i,t} \quad (1)$$

where *SENT* is a firm's press-initiated net positive sentiment. Following Cahan et al. (2015), we calculate it using the total positive sentiment news less the total negative sentiment news for the year *t* scaled by the total number of news items in that year. TRNA classified news sentiment (i.e., positive or negative) according to the sentiment score for each news item, calculated based on the tones of each sentence. We use the annual net value of the media sentiment here because we are interested in the overall improvement of a firm's media image. Alternatively, we employ-two other measures to capture the positive media sentiment and negative media sentiment separately, namely *PSENT* and *NSENT*. *PSENT* is the press-initiated positive sentiment for a firm, measured as the portion of total positive sentiment over total numbers of news items, and *NSENT* is the press-initiated negative sentiment for a firm, measured as the portion of total negative sentiment over total numbers of news items.

TI is our proxy of tournament-based incentives, measured as the pay gap between the CEO and the executives. It is calculated as the natural logarithm of the difference between a CEO's total compensation and the median total compensation of executives. This variable captures the extent of increase in a median executive's total compensation if he or she wins the promotion tournament. β_1 is the coefficient of interest, where a positive value supports H1 (the "efficiency perspective" of tournament), and a negative value is consistent with H2 (the "agency problem perspective" of tournament).

Following prior studies, we control for stock performance (*RET*), firm size (*SIZE*), the book-to-market ratio (*BM*), return on asset (*ROA*), and firm leverage (*LEV*) to mitigate the concern that our results are driven by firm-specific characteristics (Cahan et al., 2015). We also control for the corporate advertising expenditure (*ADV*) as Gurun and Butler (2012) suggest that advertising expenditure has a significant impact on firms' media sentiment. Besides, we control for the total number of news items (*TNEWS*) and firm-initiated net positive sentiment (*SENTF*) since we do not want our results to be driven by the level of news coverage (Cahan et al., 2015) or the response to news initiated by firms (Ahern and Sosyura, 2014). We include industry fixed effects and industry homogeneity (*INDHOMO*) in our control set because media sentiment may vary across industries (Kothariel *et al*, 2009). Furthermore, we control for CEO characteristics, including CEO tenure (*TENURE*), CEO directorship (*CEODIR*) as these two factors can influence executives' promotion-based incentives. We also include *DELTA* and *VEGA* in our regression model to control for the effect of CEOs' performance-based incentives on media sentiment (Core and Guay, 2002). Standard errors are clustered by firms to mitigate the statistical concern arising from autocorrelated residuals (Petersen, 2009). Appendix A contains detailed definitions of all variables.

3.3. Descriptive statistics

Table 2 presents descriptive statistics of the main variables used in the empirical analysis. We winsorise all continuous variables at the top and bottom 1 % level to minimize the impact of extreme values. The mean and median of *SENT* is positive, suggesting that our sample firms generally have a net positive media image. The median pay gap (*TI* in 000 s) is $2.766 million, indicating that a CEO, on average, earn around 2.8 million dollars more than another senior executive. This value is consistent with that reported by prior studies (Phan et al., 2017; Kini and Williams, 2012). All the other control variables are consistent with prior studies. For example, the mean value of *SIZE* (7.8482), *BM* (0.4631), *LEV* (0.2083), *ADV* (0.0123) and *TENURE* (6.8475) are similar to those reported in Cahan et al. (2015) and Phan et al. (2017).

3.4. Correlation matrix

Table 3 reports the pair-wise Pearson correlation coefficient among the variables. Consistent with our prediction, the correlation between *TI* and *SENT* (*PSENT*) is positive, whereas the correlation between *TI* and *NSENT* is negative in a univariate setting. These correlations provide preliminary support to H1, suggesting that tournament-based incentives improve a firm's

Table 1
Sample Selection and Distribution.

Panel A: Sample selection process

Data source	Observations	
Number of firm-year observations in Compustat (2002 – 2014)		122,265
Less:		
Utilities (SIC 4900 – 4999) and financial firms (SIC 6000 – 6999)	43,131	
Missing values in calculating sentiment variables	59,695	
Missing values in calculating *TI* and control variables	12,071	
Total excluded from the sample		114,897
Final sample during 2002 – 2014		**7,368**

Panel B: Sample distribution by year

Year	Frequency	Percent
2002	54	0.73%
2003	415	5.63%
2004	451	6.12%
2005	464	6.30%
2006	515	6.99%
2007	653	8.86%
2008	666	9.04%
2009	695	9.43%
2010	708	9.61%
2011	713	9.68%
2012	704	9.55%
2013	708	9.61%
2014	622	8.44%
Total	***7,368***	***100.00%***

Panel C: Sample distribution by industry

Fama-French 30 Industry	Frequency	Percent
1. Business Equipment	1,024	13.90%
2. Personal and Business Services	965	13.10%
3. Healthcare, Medical Equipment, Pharmaceutical Products	750	10.18%
4. Retail	521	7.07%
5. Petroleum and Natural Gas	389	5.28%
6. Fabricated Products and Machinery	359	4.87%
7. Wholesale	356	4.83%
8. Chemicals	352	4.78%
9. Construction and Construction Materials	319	4.33%
10. Transportation	270	3.66%
11. Food Products	224	3.04%
12. Automobiles and Trucks	216	2.93%
13.Consumer Goods	206	2.80%
14. Business Supplies and Shipping Containers	190	2.58%
15. Restaurants, Hotels, Motels	185	2.51%
16. Communication	144	1.95%
17. Steel Works Etc	131	1.78%
18. Everything Else	127	1.72%
19. Aircraft, ships, and railroad equipment	118	1.60%
20. Apparel	111	1.51%
21. Recreation	96	1.30%
22. Electrical Equipment	83	1.13%
23. Printing and Publishing	75	1.02%
24. Precious Metals, Non-Metallic, and Industrial Metal Mining	68	0.92%
25. Beer & Liquor	47	0.64%
26. Textiles	28	0.38%
27. Tobacco Products	9	0.12%
28. Coal	5	0.07%
Total	***7,368***	***100.00%***

Notes: This table presents the process of sample selection in Panel A, sample distribution by year in Panel B, and sample distribution by Fama-French 30 industry classification in Panel C. The final sample includes total 7,368 firm-year observations from 2002 to 2014.

media sentiment. Most of our control variables are significantly correlated with our media sentiment measures (i.e., *SENT*, *PSENT* and *NSENT*), suggesting that our control set is valid. The highest correlations (besides the correlations of our three media sentiment measures) are between *TNEWS* and *SIZE*. However, as they are only used as control variables and none of them is highly correlated with our media sentiment measures, we believe our analysis is reasonably free from the multicollinearity issue.

Table 2
Descriptive Statistics.

Variable	N	Mean	Std. Dev.	P25	Median	P75
SENT	7,368	0.1115	0.1538	0.0234	0.1232	0.2137
PSENT	7,368	0.3285	0.0820	0.2723	0.3240	0.3802
NSENT	7,368	0.2170	0.0973	0.1480	0.2019	0.2689
TI (in 000 s)	7,368	4,080.3690	4,259.1670	1,259.5100	2,765.5230	12,405.6500
TI	7,368	7.8121	1.0906	7.1385	7.9250	8.5762
RET	7,368	0.1794	0.4517	−0.0771	0.1348	0.3629
SIZE	7,368	7.8482	1.5902	6.6994	7.6890	8.9352
BM	7,368	0.4631	0.3659	0.2485	0.3955	0.6025
ROA	7,368	0.0542	0.0963	0.0300	0.0607	0.0958
LEV	7,368	0.2083	0.1776	0.0549	0.1945	0.3077
ADV	7,368	0.0123	0.0269	0.0000	0.0000	0.0114
TNEWS	7,368	183.3785	180.2582	79.0000	123.0000	209.0000
SENTF	7,368	0.2668	0.2420	0.0873	0.2875	0.4520
INDHOMO	7,368	0.2281	0.1233	0.1276	0.1854	0.3031
TENURE	7,368	6.9475	7.0326	2.0000	5.0000	10.0000
CEODIR	7,368	0.5812	0.4934	0.0000	1.0000	1.0000
DELTA	7,368	5.6117	1.3820	4.7188	5.6176	6.5130
VEGA	7,368	4.2150	1.9488	3.3709	4.4338	5.3713

Notes: This table presents the descriptive statistics for the variables used in the baseline regression. All continuous variables are winsorized at the 1st and 99th percentile. Appendix A provides variable definitions.

3.5. Test of differences

To test the impact of tournament incentives on corporate media image, we first construct a univariate analysis in which we compare media sentiment for firms with above- and below-median *TI*. Table 4 reports the univariate test result. Column (1) and Column (2) report the mean value of different variables among firms with high *TI* (i.e., the incentive level is higher than the sample median) and low *TI* (i.e., the incentive level is lower than sample median), respectively. Column (3) presents the differences in the mean value. We find that firms with high *TI* have significantly higher *SENT*. This result suggests that a higher tournament-based incentive is associated with a better media image.

4. Main results

4.1. Baseline result

Table 5 reports our baseline regression result. Column (1) reports the result using *SENT* as the dependent variable. A positive and statistically significant (at 1 % level) coefficient on *TI* (0.0092) suggests that firms with high tournament-based incentives receive more favourable news reporting, controlling for firm- and CEO-specific characteristics. This result supports H1 (“efficiency perspective” of tournament) and refutes the prediction of H2 (“agency problem perspective” of tournament).

To gain an insight into whether *TI* improves media image through improving positive sentiment or reducing negative sentiment, we regress *PSENT* on *TI* in Column (2) and regress *NSENT* on *TI* in Column (3), respectively. A positive and statistically significant coefficient (at 10 % level) on *TI* in Column (2) and a negative and statistically significant coefficient (at 1 % level) on *TI* in Column (3) indicate that tournament-based incentives improve corporate media image through both improving positive sentiment and reducing negative sentiment.

In terms of economic magnitude, the results suggest that a one standard deviation increase in tournament-based incentive is associated with an increase of 6.52 % (=0.0092 × 1.0906/0.1538) in net media sentiment, an increase of 3.7 % (=0.0028 × 1.0906/0.0820) in positive media sentiment, and a decrease of 7.17 % (=-0.0064 × 1.0906/0.097) in negative media sentiment. The signs of our control variables are also consistent with prior studies (Cahan et al., 2015). For example, we find that the coefficients on *ROA* and *RET* are significantly positive, consistent with the notion that firms with higher returns receive more favourable media reporting comparing to others.

4.2. Change and firm fixed effects

While the baseline regression result suggests that there is a positive relationship between tournament-based incentives and media sentiment, the result might be driven by some unobservable and persistent firm characteristics. To address this concern, we adopt two approaches. First, we follow Kubick and Lockhart (2016) and examine the relationship between *TI* and media sentiment using the changes regression. Specifically, we regress the changes of media sentiment ($\Delta SENT$) on the changes of tournament-based incentives (ΔTI) and changes in control variables. Column (1) of Table 6 reports the result.

Table 3
Correlation matrix.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	*SENT*	1.0000																
(2)	*PSENT*	**0.8340**	1.0000															
(3)	*NSENT*	**−0.8843**	**−0.4807**	1.0000														
(4)	*TI*	**0.1553**	**0.2058**	**−0.0732**	1.0000													
(5)	*RET*	**0.1782**	**0.1918**	**−0.1203**	**0.0247**	1.0000												
(6)	*SIZE*	**0.1760**	**0.2497**	**−0.0690**	**0.6692**	**0.0803**	1.0000											
(7)	*BM*	**−0.2053**	**−0.1898**	**0.1648**	**−0.2023**	**−0.2833**	**−0.3579**	1.0000										
(8)	*ROA*	**0.2839**	**0.1967**	**−0.2840**	**0.1411**	**0.1123**	**0.3041**	**−0.3156**	1.0000									
(9)	*LEV*	**−0.0290**	**0.0236**	**0.0653**	**0.1815**	−0.0148	**0.1128**	**−0.1550**	**−0.1411**	1.0000								
(10)	*ADV*	**−0.0203**	0.0175	**0.0467**	**0.0574**	0.0084	**0.0910**	**−0.1008**	**0.1086**	**0.0362**	1.0000							
(11)	*TNEWS*	**−0.0403**	**0.0479**	**0.1037**	**0.4929**	**−0.0451**	**0.6938**	**−0.0875**	**0.0623**	**0.0967**	**0.1131**	1.0000						
(12)	*SENTF*	**0.1827**	**0.1681**	**−0.1484**	**0.2121**	−0.0096	**0.2360**	**−0.1013**	**0.0926**	0.0039	**0.0685**	**0.2055**	1.0000					
(13)	*INDHOMO*	**−0.0562**	−0.0037	**0.0843**	**0.0473**	0.0037	**0.0874**	**0.1013**	**0.0321**	**0.0996**	**0.0235**	**0.1056**	**−0.1108**	1.0000				
(14)	*TENURE*	**0.0296**	0.0010	**−0.0464**	**−0.0698**	−0.0082	**−0.1004**	**0.0498**	−0.0147	**−0.0437**	**−0.0768**	**−0.1016**	**−0.1116**	**0.0266**	1.0000			
(15)	*CEODIR*	−0.0071	−0.0138	−0.0004	0.0097	0.0138	**−0.0534**	**−0.0462**	−0.0048	**−0.0324**	**−0.0226**	**−0.0507**	**0.0619**	**−0.1010**	**−0.1583**	1.0000		
(16)	*DELTA*	**0.2007**	**0.2146**	**−0.1370**	**0.4707**	**0.1645**	**0.6507**	**−0.3669**	**0.3036**	**0.0287**	**0.0728**	**0.3444**	**0.1537**	**0.0278**	**0.2665**	**−0.0901**	1.0000	
(17)	*VEGA*	**0.0274**	**0.0658**	0.0123	**0.4608**	−0.0006	**0.5161**	**−0.1948**	**0.1381**	**0.0621**	**0.0744**	**0.3477**	**0.1878**	**−0.0469**	−0.0165	0.0025	**0.5196**	1.0000

Notes: This table shows the pair-wise Pearson correlation coefficient among the variables. Bold numbers denote significance levels 10 % or lower.

Table 4
Test of Differences.

Variable	High *TI*	Low *TI*	Differences of the mean	*t*-statistics for the mean differences	*p*-values
	(1)	(2)	(3) = (1) – (2)	(4)	(5)
SENT	0.1336	0.0894	0.0442***	12.4515	0.0000
PSENT	0.3450	0.3120	0.0329***	17.5935	0.0000
NSENT	0.2114	0.2227	−0.0114***	−5.0189	0.0000
RET	0.1846	0.1742	0.0104***	0.9893	0.0000
SIZE	8.7999	6.8965	1.9034***	64.1170	0.0000
BM	0.3939	0.5323	−0.1384***	−16.5372	0.0000
ROA	0.0669	0.0414	0.0256***	11.4964	0.0000
LEV	0.2381	0.1785	0.0596***	14.6147	0.0000
ADV	0.0138	0.0108	0.0030***	4.7829	0.0000
TNEWS	259.2082	107.5489	151.6593***	39.8003	0.0000
SENTF	0.3126	0.2210	0.0916***	16.5502	0.0000
INDHOMO	0.2316	0.2247	0.0069**	2.4063	0.0161
TENURE	6.5160	7.3789	−0.8926***	−5.2758	0.0000
CEODIR	0.5760	0.5863	−0.0103	−0.8972	0.3696
DELTA	6.1946	5.0288	1.1658***	39.9297	0.0000
VEGA	5.0070	3.4231	1.5839***	38.1747	0.0000

Notes: This table presents the differences between the means of the variables based on subsamples of high and low tournament-based incentives. We define High (Low) if *TI* is higher (lower) than the sample median.

Table 5
Effect of Tournament Incentives on Media Sentiment: Baseline Regression.

	Dependent variable = *SENT* (1)		Dependent variable = *PSENT* (2)		Dependent variable = *NSENT* (3)	
	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value
TI	0.0092***	3.1394	0.0028*	1.7894	−0.0064***	−3.3899
RET	0.0551***	10.0695	0.0272***	10.0057	−0.0279***	−8.3870
SIZE	0.0188***	5.8068	0.0135***	7.3532	−0.0054**	−2.5537
BM	−0.0188*	−1.9035	−0.0050	−1.0609	0.0138**	2.0752
ROA	0.2806***	9.2863	0.0670***	4.9805	−0.2140***	−10.6847
LEV	−0.0236	−1.4208	−0.0050	−0.5850	0.0185*	1.6919
ADV	−0.3202***	−2.6853	−0.0605	−0.9989	0.2594***	3.3747
TNEWS	−0.0002***	−12.2573	−0.0001***	−7.7424	0.0001***	11.8425
SENTF	0.1025***	7.9941	0.0429***	6.3182	−0.0603***	−7.1737
INDHOMO	−0.0898**	−2.0209	−0.0136	−0.6327	0.0750**	2.4673
TENURE	−0.0000	−0.0385	−0.0003	−1.2555	−0.0003	−0.7694
CEODIR	−0.0050	−0.9969	−0.0042	−1.5957	0.0008	0.2352
DELTA	0.0092***	2.7981	0.0044***	2.6947	−0.0047**	−2.1049
VEGA	−0.0065***	−4.2399	−0.0030***	−3.7107	0.0035***	3.8049
Constant	−0.2296***	−5.2695	0.1512***	6.6674	0.3844***	13.4194
Year FE	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
Adjusted R-squared	0.2690		0.2566		0.2478	
Observations	7,368		7,368		7,368	

Notes: This table presents the association between tournament-based incentives (*TI*) and media sentiment. Column (1) presents the results of the baseline regression with the net positive sentiment (*SENT*) as the dependent variable. Columns (2) and (3) report regression estimates for alternative media sentiment specifications, namely, only positive sentiment (*PSENT*) and only negative sentiment (*NSENT*), respectively. Appendix A provides definitions of all variables. The *t*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10 %, 5 %, and 1 %, respectively.

Consistent with our baseline finding, the coefficient on Δ*TI* remains positive and significant at the 1 % level (coefficient = 0.0165; *t*-value = 6.3003). Second, we rerun our baseline regression using the firm-fixed effects model. As shown in Column (2) of Table 6, the coefficient on *TI* is still positive and statistically significant at the 1 % level (coefficient = 0.0172; *t*-value = 6.4283), supporting our baseline finding in Table 6. Overall, these two tests provide additional support for our "efficiency perspective" of tournament argument (H1) that tournament-based incentives help improve a firm's media sentiment.

4.3. Tests of endogeneity

To address the endogeneity issue of functional form misspecification (Shipman et al., 2017), systematic differences among firms with high and low tournament incentives and reverse causality bias, we employ several important tests in this section.

Table 6
Change and Firm Fixed Effects Regressions.

	Change regression Dependent variable = *ΔSENT* (1)		Firm-fixed effects regression Dependent variable = *SENT* (2)	
	Coeff.	*t*-value	Coeff.	*t*-value
TI	0.0165***	6.3003	0.0172***	6.4283
RET	0.0156***	3.1860	0.0441***	8.8338
SIZE	0.1056***	12.2563	0.0410***	7.2308
BM	0.0123	0.9757	−0.0299***	−2.7765
ROA	0.1485***	5.1982	0.2426***	8.7489
LEV	0.0494*	1.8537	−0.0494**	−2.3077
ADV	−0.2240	−0.7410	−0.5753**	−2.1566
TNEWS	−0.0001***	−4.0083	−0.0002***	−6.0737
SENTF	0.1037***	8.0089	0.0998***	9.0330
INDHOMO	0.2779	1.5481	−0.0716	−0.5131
TENURE	−0.0004	−0.6134	−0.0001	−0.1761
CEODIR	0.0045	0.8074	−0.0012	−0.2416
DELTA	0.0002	0.0636	0.0077**	2.1491
VEGA	−0.0023	−1.1719	−0.0045**	−2.2118
Constant	−0.0399	−1.2876	−0.4618***	−7.7477
Year FE	Yes		Yes	
Industry FE	Yes		No	
Firm FE	No		Yes	
Adjusted R-squared	0.1784		0.2718	
Observations	6,023		7,368	

Notes: This table presents the association between tournament-based incentives (*TI*) and the change in media sentiment. Column (1) presents the results with the change in net positive sentiment (*ΔSENT*) as the dependent variable. Column (2) reports the results with the net positive sentiment (*SENT*) as the dependent variable after controlling for firm-fixed effects. Appendix A provides definitions of all variables. The *t*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10%, 5%, and 1%, respectively.

4.3.1. Difference-in-Differences (DiD) regression with exogenous CEO turnover

In this section, we perform a difference-in-differences (DiD) test employing exogenous CEO turnover in a firm as a positive shock to executives' tournament incentives. Exogenous CEO turnover refers to the case where a CEO leaves a firm due to exogenous events such as health-related issues (Eisfeldt and Kuhnen, 2013). Such exogenous CEO turnover can be viewed as a positive shock to *TI* because it increases the probability of the turnover firms' other executives winning the CEO position, which consequently increases their tournament incentives.

To perform the DiD test, we first collect the exogenous CEO turnover data from Eisfeldt and Kuhnen's (2013) turnover dataset.[1] Since Eisfeldt and Kuhnen's dataset only records the exogenous CEO turnover events between 1992 and 2006, we manually extend their dataset until 2014 following their method. Our DiD sample contains 78 exogeneous CEO turnover events from 2002 to 2014. We then defined firms with exogeneous CEO turnover events as our treated firms and match each of the treated firms with a control firm that does not experience any exogenous CEO turnover event over our sample period based on year, Fama-French 30 industry group and the control variables used in the baseline regression model. Using the DiD sample, we estimate the following regression to examine the impact of the positive *TI* shock on media sentiment:

$$SENT_{i,t} = \beta_1 TI_{i,t} + \beta_2 TI_{i,t} \times POST + \beta_3 TI_{i,t} \times TREAT \times POST + \beta_4 TI_{i,t} \times TREAT + \beta_5 TREAT \times POST + \beta_6 TREAT + \beta_7 POST + Othercontrols + Fixedeffects + \varepsilon_{i,t} \quad (3)$$

where *TREAT* is a dummy variable that takes the value of one if a firm experienced exogenous CEO turnover during our sample period and zero otherwise. *POST* is an indicator variable that equals one following the exogenous CEO turnover and equals zero prior to the turnover. The triple interaction term, $TI_{i,t} \times TREAT \times POST$, is our main variable of interest as it captures the impact of *TI* on *SENT* when the executives of a firm are more incentivised to compete for the CEO position.

Table 7 presents the results from the DiD analysis. We find that the coefficient estimates on *TI* remain positive and significant (coef. = 0.1964, t = 1.81), suggesting that *TI* has a positive impact on *SENT*. More importantly, we show that the triple interaction term, $TI_{i,t} \times TREAT \times POST$, is positive and significant at a 5 % level (coef. = 0.0403, t = 2.24). These findings suggest that executives of firms that experienced exogenous CEO turnover events have a stronger incremental impact on *SENT* in comparison to those firms that do not experience any turnover event, consistent with our argument that executives have greater incentive to showcase their skill to win the tournament competition when the chances of winning increase (i.e., when a firm experienced exogenous CEO turnover). Overall, the results in this section suggest that the association between *TI* and *SENT* is likely to be causal.

[1] Available at https://sites.google.com/site/andrealeisfeldt/.

Table 7
Difference-in-Differences (DiD) Regression.

	Dependent variable = *SENT*	
	Coeff.	*t*-value
TI	**0.0196***	**1.81**
TREAT	0.1940*	1.69
TI × *TREAT*	−0.0245*	−1.66
POST	0.1428	1.43
TI × *POST*	−0.0193	−1.54
TREAT × *POST*	−0.3119**	−2.16
TI* × *TREAT* × *POST	**0.0403****	**2.24**
RET	0.0709***	4.91
SIZE	0.0226***	2.61
BM	−0.0019	−0.05
ROA	0.3643***	4.21
LEV	−0.0047	−0.14
ADV	−0.3796*	−1.69
TNEWS	−0.0003***	−6.96
SENTF	0.1674***	3.49
INDHOMO	−0.1961**	−2.07
TENURE	−0.0001	−0.13
CEODIR	−0.0144	−1.41
DELTA	0.0110*	1.71
VEGA	−0.0089***	−2.90
Constant	−0.4520***	−4.50
Year FE	Yes	
Industry FE	Yes	
Observations	1,370	
Adjusted R-squared	0.3722	

Notes: This table reports DiD regression results with exogenous CEO turnover. *TREAT* is an indicator that takes the value of one for firms experienced exogenous CEO turnovers during the sample period. *POST* is an indicator equals to one starting from the year in which firms experienced a CEO turnover. Appendix A provides definitions of all variables. The *t*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10 %, 5 %, and 1 %, respectively.

4.3.2. Difference-in-Differences (DiD) regression with Say-on-Pay law

Alternatively, we also employ the implementation of Say-on-Pay law as a (hereafter SOP) as a negative exogenous shock to executives' tournament incentives.[2] The rapid increase in CEO compensation in the last decades has raised the concerns of financial regulators and the general public. To alleviate such concerns, the SOP has been passed in the U.S in 2010 as a provision of the Dodd-Frank Act. The SOP enhanced shareholder voice by allowing them to vote on the approval of executive compensation, curving the rapid growth of CEO compensation and consequently reducing the pay gap between executives (Correa and Lel, 2016). Given that the implementation of SOP is highly related to corporate pay gap yet is unlikely to directly impact corporate media image, it can thus be used as a quasi-exogenous shock to identify the causal effects of *TI* on *SENT*.

To perform the quasi-natural experiment test, we first define the treatment firms as those with above-average *TI* prior to the implementation of SOP. We estimate a firm's pre-SOP *TI* level as the average value of its *TI* 5 years before the 2010 implementation year (i.e., 2005–2009). We then match each of the treatment firms with a firm with below-average pre-SOP *TI* based on our baseline control set. The balance tests reported in Column (2), Panel A of Table 8 suggest that there's no significant difference regarding firm-specific characteristics among treatment firms and control firms after matching. To construct a balanced sample, we limit our SOP-DiD sample to observations from 5 years before the SOP to 5 years after and we further exclude observations of the implementation year (i.e., 2010).[3] To ensure that our SOP-DiD sample satisfies the parallel trend assumption (Roberts and Whited, 2012) that the trends in outcome variables for the treatment and control groups do not exhibit significant differences, we also perform a parallel trend test. As reported in Panel B of Table 8, the pre-event growth of our outcome variable (i.e., *SENT*) in the treatment group does not differ significantly from the control group.

After validating our SOP-DiD sample, we then perform a DiD test to estimate the treatment effect by replacing the *TI* in our baseline regression with *POSTSOP*, *TREATSOP* and their interaction term (i.e., *POSTSOP* × *TREATSOP*). *POSTSOP* is an indicator for the post-event period and *TREATSOP* is a dummy variable that is equal to 1 for treatment firms and 0 otherwise. Since the implementation of SOP results in a sharper decrease in the pay gap of treatment firms in comparison to the control firms, the treatment firms should experience a greater decrease in *SENT* following the SOP. Consistent with our argument, the

[2] We thank an anonymous referee for suggesting this test.
[3] The result remains consistent if we limit our SOP-DiD sample to observations from 3 years before the SOP to 3 years after.

Table 8
Quasi-natural experiment: The implementation of Say-on-Pay Law (SOP).

Panel A: PSM-DID Result

	Pre-Matched Sample (1) Dependent variable = *TREATSOP*		Post-Matched Sample (2) Dependent variable = *TREATSOP*		PSM-DID Result (3) Dependent variable = *SENT*	
	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value
POSTSOP					0.0869***	5.3316
TREATSOP					0.0193*	1.8165
POSTSOP* × *TREATSOP					**−0.0445*** **	**−3.2590**
RET	−0.0148	−1.1737	0.0075	0.2842	0.0482***	4.5913
SIZE	0.1570***	11.0694	−0.0163	−0.4781	0.0336***	4.8997
BM	0.1106***	2.7661	−0.0029	−0.0463	−0.0263	−1.4495
ROA	−0.2881***	−2.9410	0.1252	0.6753	0.2268***	3.7544
LEV	0.3533***	4.3533	−0.0303	−0.2276	0.0105	0.4078
ADV	−0.6326	−1.1703	−0.3601	−0.3261	−0.4474**	−2.1030
TNEWS	−0.0001	−1.0377	0.0002	0.5041	−0.0004***	−6.6885
SENTF	0.1416***	2.9666	−0.0057	−0.0657	0.0909***	5.6770
INDHOMO	0.3151	1.5162	0.3064	0.8497	−0.0804	−1.2649
TENURE	−0.0056***	−2.9527	−0.0004	−0.1238	0.0002	0.1366
CEODIR	−0.0011	−0.0546	−0.0200	−0.4791	0.0060	0.5445
DELTA	0.0303**	2.4336	−0.0054	−0.2097	0.0078	1.0974
VEGA	0.0367***	5.8107	−0.0021	−0.1774	−0.0074***	−3.7895
Constant	−1.1419***	−8.5821	0.5022	1.5608	−0.1081	−1.6205
Year FE	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
Observations	7,076		1,844		1,844	
Pseudo R-squared/ Adjusted R-squared	0.4252		0.0147		0.2805	

Panel B: Parallel trend result

Pre-event trends in Sentiment (SENT) for treated and matched firms

		Average change from *t-5* to *t-4*	Diff (*t*-value)	Average change from *t-4* to *t-3*	Diff (*t*-value)	Average change from *t-3* to *t-2*	Diff (*t*-value)	Average change from *t-2* to *t-1*	Diff (*t*-value)
SENT	Treated	−0.0128	−0.0191	0.0291	0.0161	−0.0320	−0.0134	−0.0303	0.0155
	Matched	0.0063	(-1.0272)	0.0131	(0.9774)	−0.0186	(-0.7820)	−0.0458	(0.8963)

Notes: Panel A reports DiD regression results with the implementation of Say-on-Pay law (SOP). *TREATSOP* is an indicator that takes the value of one for firms with above-average TI prior to the implementation of SOP. *POSTSOP* is an indicator equals to one starting from the SOP implementation year. Panel B reports the parallel trend result. Appendix A provides definitions of all variables. The *t*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10%, 5%, and 1%, respectively.

coefficient of the interaction term (coef. = -0.0445, *t* = -3.2590; Column (3), Panel A of Table 8) is negative and significant, suggesting that the implementation of SOP results in a smaller pay gap and thereby results in a decrease in media sentiment.

4.3.3. Propensity score matching (PSM)

To implement the PSM, we initially run a first-stage logistic regression model with *HighTI* as the dependent variable, following prior literature (i.e., Humphery-Jenner et al., 2016)).

$$PRO(HighTI = 1)_{i,t} = \beta_1 + \beta_2 RET_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 BM_{i,t} + \beta_5 ROA_{i,t} + \beta_6 LEV_{i,t} + \beta_7 ADV_{i,t} + \beta_8 TNEWS_{i,t} + \beta_9 SENTF_{i,t} + \beta_{10} INDHOMO_{i,t} + \beta_{11} TENURE_{i,t} + \beta_{12} CEODIR_{i,t} + \beta_{13} DELTA_{i,t} + \beta_{14} VEGA_{i,t} + YearFE + IndustryFE + \varepsilon_{i,t} \quad (2)$$

We define *HighTI* equal to 1 for firm-year observations with *TI* that are higher than the sample median, and 0 otherwise. We include the same control set as our baseline regression model (Humphery-Jenner et al., 2016). Table 9 presents the regression results.

Column (1) reports the first-stage logistic regression results. Next, we employ-one-to-one nearest neighbour matching for firms with high and low tournament incentives without replacement in order to match our treatment sample ($HighTI = 1$) to the control sample ($HighTI = 0$) with the closest propensity scores. Then we rerun the first-stage logistic regression model with the matched sample and report the result in Column (2). As shown in Column (2) of Table 9, the coefficients of all control variables are insignificant, suggesting that the treatment group and the control group share similar characteristics after matching.

After confirming that our matched sample is valid, we then regress *HighTI* on *SENT* to compare the media favourability between the treatment group and the control group. Column (3) of Table 9 presents the result. We find that the coefficient

Table 9
PSM Regression.

	Pre-matched sample Dependent variable = *High TI* (1)		Post-matched sample Dependent variable = *High TI* (2)		PSM second-stage regression Dependent variable = *SENT* (3)	
	Coeff.	*z*-value	Coeff.	*z*-value	Coeff.	*t*-value
High TI					0.0210***	3.3802
RET	−0.0482	−0.5369	0.0961	0.8611	0.0725***	8.7295
SIZE	0.9572***	12.9899	−0.0063	−0.0801	0.0271***	5.3139
BM	0.3517**	2.0665	0.1565	0.8962	−0.0167	−1.1025
ROA	−0.6226	−1.2356	0.2252	0.3435	0.2946***	4.6367
LEV	1.4126***	4.5235	−0.3378	−0.9934	−0.0175	−0.7699
ADV	−1.7675	−0.7654	0.3516	0.14	−0.3381*	−1.8952
TNEWS	0.0017**	2.2772	0.0004	0.5343	−0.0003***	−8.4962
SENTF	0.4812**	2.3988	−0.2105	−0.9062	0.1013***	6.9518
INDHOMO	1.0208	1.2338	−0.0647	−0.0713	−0.0627	−1.1438
TENURE	−0.0149*	−1.9369	0.0005	0.052	0.0004	0.4277
CEODIR	0.1716*	1.7785	−0.1656	−1.4681	−0.0040	−0.4805
DELTA	0.2227***	3.3001	−0.0799	−1.1536	0.0060	1.1889
VEGA	0.2402***	4.0845	0.0444	0.9504	−0.0042**	−2.0045
Constant	−10.9851***	−13.8526	0.4512	0.5167	−0.2288***	−3.7059
Year FE	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
Pseudo/Adjusted R-squared	0.3873		0.0102		0.2886	
Observations	7,354		2,658		2,658	

Notes: This table presents the propensity score matching (PSM) estimations of the association between tournament-based incentives (*TI*) and media sentiment. Columns (1) and (2) present the regression estimates of the pre- and post-matched sample with High *TI* as the dependent variable. Column (3) reports the second stage PSM estimations with net positive sentiment (*SENT*) as the dependent variable. Appendix A provides definitions of all variables. The *t*- and *z*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10 %, 5 %, and 1 %, respectively.

on *HighTI* is positive and significant at the 1 % level. Overall, the result of propensity score matching analyses shows that our baseline finding is less likely to be driven by functional form misspecification or systematic differences among firms. However, we would suggest that our results in the PSM should be interpreted with caution due to PSM's limitations to mitigate endogeneity concerns (Shipman et al., 2017).

4.3.4. Two-stage least squares (2SLS) regression

To address the endogeneity concern of reverse causality and omitted variables bias, we apply 2SLS regression with IV method. Specifically, we use the industry median value of tournament incentives (*IndTI*) as the instrumental variable, following Shen and Zhang (2017). We employ *IndTI* as the instrumental variable due to the following reasons: First, given that the instrumental variable should be highly associated with the endogenous variable (*TI*), we believe *IndTI* meet this "relevance" criterion. Moreover, Murphy (1999) suggests that executives' compensation varies significantly by industry. For example, many firms take into consideration of their peer-firms' compensation level when deciding on their owns (Faulkender and Yang, 2010), and they tend to adjust the compensation package when their peer-group firms do so (DiPrete et al., 2010). Therefore, a firm's executive compensation, particularly, tournament incentives could be influenced by its industry peers across time (Shen and Zhang, 2017). Second, a valid instrumental variable should only affect the dependent variable by influencing the endogenous variable. We believe *IndTI* also fulfil this exclusion restriction. While *IndTI* can directly influence each firm's *TI* level, it is less likely to directly influence an individual firm's media sentiment. On these grounds, we believe *IndTI* is a reasonable instrument.

We report the regression estimates in Table 10. Consistent with our prediction, we find a positive and highly statistically significant relationship between *IndTI* and *TI* in the first-stage regression reported in Column (1). To provide evidence that further support the validity of our instrumental variable, we report the *F*-statistic of the excluded instrument (Staiger and Stock, 1997) and the Kleibergen-Paap statistics (Baum et al., 2007). The results shown in Table 10 reject the null hypothesis that the instrumental variable is weak or under-identified and confirm the relevance of our instrumental variable. In the second stage regression, we regress *SENT* on the predicted value of *TI*. As shown in Column (2) of Table 10, the coefficient of *TI* is positive and significant at the 1 % level (coefficient: 0.0708; *t*-value: 3.9259), suggesting that the positive relationship between tournament-based incentive and media sentiment is robust to the potential endogeneity problems. Furthermore, the highly statistically significant Hausman exogeneity test justifies the use of 2SLS technique. However, we still note that

Table 10
2SLS (IV) Regression.

	Dependent variable = *TI* (1) *First-stage*		Dependent variable = *SENT* (2) *Second-stage*	
	Coeff.	*t*-value	Coeff.	*t*-value
Ind TI	0.4622***	9.8262		
TI			0.0708***	3.9259
RET	0.0113	0.4424	0.0540***	9.4680
SIZE	0.3575***	17.8028	−0.0034	−0.4595
BM	0.1680***	3.4059	−0.0292***	−2.6899
ROA	−0.4398***	−3.1564	0.3072***	9.5405
LEV	0.5485***	5.2509	−0.0572***	−2.8020
ADV	−0.7466	−1.0485	−0.2715**	−1.9912
TNEWS	0.0002	1.324	−0.0003***	−11.4275
SENTF	0.2325***	3.8926	0.0880***	6.2230
INDHOMO	0.6693**	2.5028	−0.1327***	−2.6231
TENURE	−0.0052*	−1.8052	0.0003	0.5664
CEODIR	0.0925***	3.0809	−0.0110*	−1.9441
DELTA	0.0798***	3.4606	0.0041	1.0867
VEGA	0.0802***	5.5882	−0.0114***	−4.4510
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Firm FE	No		No	
Adjusted R-squared	0.5243		0.0948	
Observations	7,368		7,368	
Model fits:				
Test of endogeneity				
Hausman test				
χ^2	12.608***			
p-value	0.000			
Under identification test				
Kleibergen-Paap rk LM statistic	60.697***			
Weak identification test				
Kleibergen-Paap rk Wald F statistic	96.554***			

Notes: This table shows the regression estimates of the relation between tournament-based incentives (*TI*) and media sentiment (*SENT*), using two-stage least squares (2SLS) with instrumental variables (IV) approach. Column (1) reports the first-stage regression estimates with *TI* as the dependent variable. Column (2) presents regression estimates of the second stage model with *SENT* as the dependent variable. All models include a constant. All variables are defined in Appendix A. The *t*-values are calculated based on robust standard errors clustered at the firm level. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively.

our findings in 2SLS should be interpreted with caution as *IndTI* might have limitations for which it might not be considered as a truly exogenous instrument. For example, other firms in the industry might experience some unobserved heterogeneities that could be correlated with the focal firm's unobserved heterogeneities.[4]

4.3.5. System GMM

There could be a potential criticism of our use of only one instrumental variable with the 2SLS model. We address this concern next by using the two-step system GMM approach (Blundell and Bond, 1998). Importantly, by employing the two-step GMM method, we can also mitigate any potential concerns of omitted variable bias as well as heterogeneity in our sample that could be responsible for a positive association between *TI* and *SENT*. Table 11 shows the regression results.

The coefficient on *TI* (0.0486) is positive and statistically significant at the 1 % level (*t*-value = 2.88). Moreover, one essential component in a System GMM model, lagged dependent variable (*LAG SENT*) is also positively significant at the 1 % level. In addition, the diagnostic statistics suggest validity of our results. Particularly, in the diagnostic test for serial correlation, our presumption is to receive a significant first-order serial correlation and insignificant second-order correlation for the first-differenced residuals confirming the property that errors in levels are serially uncorrelated. Accordingly, our results show that AR(1) is statistically significant at the 1 % level with the *z*-value of −15.55 and *p*-value of 0. Similarly, AR(2) is highly statistically insignificant with the *z*-value of −0.37 and *p*-value of 0.711. Furthermore, we also test the validity of the internal instruments used in the two-step system GMM model. Specifically, we obtain a statistically insignificant Hansen test of overidentifying restrictions with a *p*-value of 0.498, supporting the validity of the internal instruments employed in our two-step system GMM model.

[4] We thank an anonymous referee for this caution.

Table 11
System GMM.

	Dependent variable: SENT	
	Coeff.	*t*-value
LAG SENT	0.2437***	11.06
TI	**0.0486*** **	**2.88**
RET	0.0157	0.87
SIZE	0.0069	0.52
BM	−0.0689**	−2.27
ROA	0.1780*	1.70
LEV	−0.0857*	−1.74
ADV	−0.3354	−0.62
TNEWS	−0.0002***	−4.80
SENTF	0.0262	0.65
INDHOMO	−0.2452	−1.12
TENURE	−0.0013	−1.03
CEODIR	0.0008	0.07
DELTA	0.0084	0.97
VEGA	0.0001	0.06
Constant	−0.1954	−1.59
Industry FE	Yes	
Year FE	Yes	
Observations	6,838	

Notes: This table presents results from the system GMM regressions. Variable definitions are reported in Appendix A. The *t*-statistics in parentheses are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

5. Additional analyses

5.1. Effect of non-competition agreement

In this section, we further explore whether there is a causal relationship between *TI* and media sentiment, using exogenous change to *TI* due to variations in state-level non-competition agreements. The non-competition agreement is introduced to prevent a firm's employees from joining a rival company and its enforcement level varies across states. While a high enforceability non-competition agreement reduces employees' mobility and discourages them to seek for external promotion, it increases their incentives to seek for internal promotion within a firm. As such, differences in the enforceability level of non-competition agreement can be viewed as a shock to *TI*. For instance, if a firm is in a high-enforcement state, its executives are less likely to accept jobs from the external market. This increases executives' incentives to seek for internal promotion by showcasing their skills to improve labour market value with a better reputation, resulting in a greater impact of *TI* on media sentiment.

To test this idea, we employ an interaction between *TI* and non-competition agreement enforcement index (*NCOMINDX*).[5] In the untabulated result but available from the authors on request, we find significantly positive coefficients on *TI* and the interaction term *TI* × *NCOMINDX*, suggesting that the impact of *TI* on media is stronger among firms with stricter non-competition enforcement.

5.2. Alternative measures of tournament

So far, we use the pay gap between the CEO and the executives as our measure of executives' tournament-based incentives. In this section, we re-examine our baseline relationship, using alternative measures of the tournament incentives to rule out any possibility that our baseline result is driven by measurement errors. Following prior studies, the three alternative measures we employed are *GINI* (the income disparity between CEO and other executives) (Kini and Williams, 2012), CDF (the normalized rank or cumulative density function of gaps), (Kale et al., 2009) and CV (the coefficient of variation of the pay gap between CEO and other executives) (Kini and Williams, 2012; Kale et al., 2009).

We report the regression results in Table 12. Particularly, we find that coefficients on *TI* remain positive and significant, suggesting that our findings are not driven by measurement errors.

5.3. Cross-sectional analyses

We also construct several cross-sectional tests to shed light on the types of firms that have greater needs for media favourability and, thus, are more likely to be influenced by other executives' tournament-based incentives. We argue that

[5] Please see Garmaise (2009) for the detailed methods of constructions of the non-competition agreement enforceability index. By construction, *NCOMINDX* captures both time-series and cross-sectional variations in non-competition agreement enforceability.

Table 12
Alternative Measures of Tournament.

	Dependent variable = *SENT*					
	GINI (1)		*CDF* (2)		*CV* (3)	
	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value
GINI	0.0539**	2.2098				
CDF			0.0383***	3.0386		
CV					0.0178*	1.9219
RET	0.0554***	10.1249	0.0553***	10.1057	0.0554***	10.1195
SIZE	0.0222***	7.0018	0.0184***	5.6073	0.0221***	6.9839
BM	−0.0173*	−1.7675	−0.0190*	−1.9114	−0.0172*	−1.7545
ROA	0.2776***	9.2042	0.2813***	9.3074	0.2773***	9.2088
LEV	−0.0199	−1.2212	−0.0240	−1.4339	−0.0195	−1.1963
ADV	−0.3227***	−2.7110	−0.3208***	−2.6825	−0.3241***	−2.7195
TNEWS	−0.0002***	−12.1475	−0.0002***	−12.2254	−0.0002***	−12.1593
SENTF	0.1035***	8.0906	0.1025***	7.9706	0.1036***	8.1051
INDHOMO	−0.0887**	−1.9977	−0.0898**	−2.0197	−0.0877**	−1.9772
TENURE	−0.0000	−0.0918	−0.0000	−0.0210	−0.0001	−0.0939
CEODIR	−0.0046	−0.8887	−0.0049	−0.9686	−0.0049	−0.9533
DELTA	0.0093***	2.8725	0.0091***	2.7567	0.0094***	2.9113
VEGA	−0.0060***	−4.0480	−0.0065***	−4.2725	−0.0060***	−4.0492
Constant	−0.2062***	−4.8005	−0.1790***	−4.1135	−0.2035***	−4.7452
Year FE	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
Adjusted R-squared	0.2679		0.2690		0.2676	
Observations	7,368		7,368		7,368	

Notes: This table presents the association between tournament-based incentives (*TI*) and media sentiment (*SENT*) with alternative measures of tournament. Appendix A provides definitions of all variables. The *t*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10%, 5%, and 1%, respectively.

the impact of *TI* on media coverage varies with firms' information opacity, analyst coverage, industry homogeneity, investor sentiment and managerial ability.

First, opacity leads to agency conflicts and results in greater information asymmetries. Therefore, firms with higher opacity are less favoured by the media. Given a negative public image, firms with higher opacity are in greater need of improving their media sentiment. As a result, the impact of TI should be more pronounced for firms with a higher degree of information opacity.

Second, the *TI*-media relationship should also vary with the level of analyst coverage. Analysts play an essential role in monitoring a firm. Prior studies suggest that firms with lower analyst coverages are associated with weaker governance (Chen et al., 2015) and thus, are less favoured by the market. Under this circumstance, it is more important to gain a positive public image with the help of media. Accordingly, we predict the impact of *TI* on media sentiment to be more pronounced among firms with lower analyst coverage.

Third, industry homogeneity may also affect the impact of *TI* on media sentiment. Other executives in heterogeneous industries are less likely to seek for external promotion in comparison to those in homogeneous industries as it is harder for them to transfer their skills in heterogenous industries (Kale et al., 2009). As a result, executives in heterogeneous industries have greater incentives to improve their competitiveness in internal promotion by showcasing their skills to improve labour market value with a better reputation, which consequently improves firms' public image. Based on these arguments, we expect the impact of *TI* on the media to be more pronounced among firms with lower industry homogeneity.

Fourth, we also consider the impact of investor sentiment on the *TI*-media relationship. Investor sentiment can affect firm performance by influencing investors' trading activity (Mian and Sankaraguruswamy, 2012). If investors are pessimistic about a firm's prospect, they may overreact to bad news, which leads to mispricing of the stock. Therefore, firms with lower investor sentiment are in greater need of improving the media favourability to counteract the pessimistic outlook. This view suggests that the impact of *TI* on media should be more pronounced among firms with lower investor sentiment.

Finally, we conjecture that managerial ability can affect the impact of TI on media sentiment. As less talented CEOs are more likely to be replaced, it increases the aggressiveness of internal competition. Therefore, other executives would have greater incentives to compete for the CEO position by showcasing their skills in firms with low managerial ability. Moreover, firms with low managerial ability are also in greater need to improve their public image. Given the above arguments, we expect the *TI*-media relationship to be stronger among firms with lower managerial ability.

We report the regression results in Table 13. Consistent with our predictions, we find that the effect of *TI* on media sentiment is more pronounced among firms with higher information opacity, lower analyst coverage, lower industry homogeneity, lower investment sentiment and lower managerial ability. Collectively, these findings support our argument that the *TI*-media relationship is stronger among firms with a greater need for media favourability.

Table 13
Cross-sectional Analyses.

	Dependent variable = *SENT*									
	Information opacity		Analyst coverage		Industry homogeneity		Investor sentiment		Managerial ability	
	(1)		(2)		(3)		(4)		(5)	
	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value
TI	0.0129***	3.8805	0.0136***	3.3186	0.0128***	3.5054	0.0071**	2.3863	0.0137***	3.9524
Low OP	0.0715*	1.7962								
TI × *Low OP*	−0.0154***	−3.2785								
High COV			0.0735**	1.9979						
TI × *High COV*			−0.0109**	−2.2951						
High HOM					0.0523	1.3610				
TI × *High HOM*					−0.0095**	−2.0678				
High INSENT							−0.6547***	−5.5796		
TI × *High INSENT*							−0.0098*	−1.8149		
High ABL									0.1027***	3.3865
TI × *High ABL*									−0.0136***	−3.6674
Control variables	Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes	
Adjusted R-squared	0.2526		0.2391		0.2700		0.2693		0.2707	
Observations	7,368		7,308		7,368		7,368		7,303	

Notes: This table presents the cross-section analyses of the association between tournament-based incentives (*TI*) and media sentiment (*SENT*). Columns (1) through (5) present the effect of information opacity, analyst coverage, industry homogeneity, investor sentiment, and managerial ability, respectively. *Low OP* is defined as a dummy variable with the value of one if a firm's volume of news coverage is lower than the sample mean. *High COV* is a dummy variable with the value of one if a firm's analyst coverage is higher than the sample mean. *High HOM* is a dummy variable with the value of one if a firm's industry homogeneity is higher than the sample mean. *High INSENT* is a dummy variable with the value of one if investor sentiment index (Baker and Wurgler, 2006) during a year is higher than the sample mean. *High ABL* is a dummy variable with the value of one if a firm's managerial ability index (Demerjian, Lev and McVay, 2012) is higher than the sample mean. All models include a constant. Appendix A provides definitions of all variables. The *t*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10%, 5%, and 1%, respectively.

5.4. Channel and consequence analyses

In this section, we examine an interesting extension of our core finding. Here, we endeavor to further disprove H2 ("agency problem perspective" of tournament) and explore whether tournament incentives impact firms' positive media image through agency problem mitigation with a contribution to firm valuation and overall corporate branding. In this regard, we have a channel test with return on equity (*ROE*) and corporate brand capital (*BRAND*) in Panel A of Table 14. Further, we offer implications of the positive *TI*-media relationship by capturing their effect on firms' overall information environment and the cost of equity (*CoE*) in Panel B of Table 14.

Extant literature finds that higher *TI* can increase firm performance (Kale et al., 2009) through *TI*'s effect on improving executives' efforts to perform better in the firm in order to win over the promotion tournament. We argue that these executives' positive efforts will eventually be captured in media coverage. Therefore, a potential channel by which *TI* can improve media sentiment is its effect over firm performance. Following Liang and Renneboog (2017), we develop this channel test in two steps. First, we find out predicted values from the regression of *ROE* on *TI* including all control variables and fixed effects. Economically and statistically, these predicted values include the variation in *ROE* that is captured by tournament incentives. Specifically, consistent with prior studies, we find a positive and statistically significant coefficient on *TI* (0.0121), suggesting that *TI* improves book value shareholder return through improving return on equity. This result also indicates that *TI* has a potential agency conflict mitigating role in the firm. However, in the second step, we run a regression of a firm's media sentiment (*SENT*) on the *Predicted ROE* from the first step. A positively significant (at 1 % level) coefficient on *Predicted ROE* (0.7561) supports our conjecture that *TI* enhances a firm's media image through improving firm performance.

Similarly, we posit that executives with higher tournament incentives will contribute to build up sustainable brand, in order to enhance their labor market value. These high-brand value firms can easily attract substantial media attention. Taken together, we argue that tournament incentives can affect media sentiment by creating greater corporate branding. We test this conjecture in Columns (3) and (4) and find support to our prediction.

In Panel B, we turn our attention to analyzing whether the positive *TI-SENT* association has any important practical implications on corporate outcomes, such as information dissemination and return premium. In Columns (1) and (2), we use idiosyncratic volatility and inverse of quoted spread as two important measures of information dissemination (Pástor and Pietro, 2003; Rajgopal and Venkatachalam, 2011; Jain et al., 2016). We argue in H1 that tournament-based incentives propagate executives' efforts to showcase their skills with the motive to enhance their labor market value and visibility, which eventually increase a firm's media visibility with a positive media sentiment. However, a firm, running a promotion tournament among executives and maintaining a better media image, might also incline to maintain a less opaque information environment between managers and outsiders in order to boost stakeholder confidence on the firm. Specifically, we predict

Table 14
Channel and consequence analyses.

Panel A: Channel analysis

	(1) First stage Dependent variable = ROE		(2) Second stage Dependent variable = SENT		(3) First stage Dependent variable = BRAND		(4) Second stage Dependent variable = SENT	
TI	**0.0119*** **	**7.39**			**0.0023** **	**2.18**		
Predicted ROE			**0.7561*** **	**3.14**				
Predicted BRAND							**3.7913*** **	**3.14**
RET	0.0587***	10.32	0.0106	0.69	−0.0004	−0.26	0.0565***	10.32
SIZE	−0.0056**	−2.15	0.0231***	7.15	−0.0091***	−5.19	0.0544***	4.90
BM	0.0354***	2.98	−0.0456***	−3.21	0.0253***	3.97	−0.1134***	−3.40
ROA	0.4376***	12.89	−0.0506	−0.46	−0.0202**	−2.09	0.3618***	9.06
LEV	0.1641***	10.26	−0.1483***	−3.16	0.0377***	4.23	−0.1685***	−3.18
ADV	−0.2745***	−4.85	−0.1139	−0.87	1.3558***	14.91	−5.4602***	−3.31
TNEWS	0.0000**	2.49	−0.0003***	−12.57	0.0000***	2.87	−0.0004***	−7.86
SENTF	0.0056	0.88	0.0983***	7.56	−0.0010	−0.29	0.1063***	8.33
INDHOMO	−0.0498	−1.44	−0.0522	−1.13	0.0311	1.13	−0.2144***	−3.64
TENURE	0.0000	0.11	−0.0000	−0.05	0.0001	0.45	−0.0003	−0.65
CEODIR	−0.0073**	−2.32	0.0005	0.08	−0.0009	−0.53	−0.0015	−0.28
DELTA	−0.0029*	−1.66	0.0113***	3.58	−0.0006	−0.49	0.0116***	3.67
VEGA	−0.0015*	−1.91	−0.0054***	−3.51	0.0013**	2.29	−0.0112***	−4.94
Constant	0.0071	0.32	−0.2341***	−5.33	0.0388**	2.06	−0.3814***	−5.34
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Observations	7,368		7,368		7,368		7,368	
Adjusted R-squared	0.3435		0.2743		0.5777		0.2743	

Panel B: Consequence analysis

	(1) Dependent variable = *Idiosyncratic*		(2) Dependent variable = *Inverse Quoted Spread*		(3) Dependent variable = *CoE*	
	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value
HIGHSENT	0.0466***	2.8487	−0.2777*	−1.8157	0.0129**	2.2505
TI	−0.0000	−0.0236	0.0467***	2.6546	0.0023***	3.7779
HIGHSENT*×*TI	−0.0057***	−2.6744	0.0381**	1.9709	−0.0014**	−1.9643
RET	−0.0011	−0.4466	−0.1134***	−3.7831	0.0130***	11.8112
SIZE	−0.0125***	−4.1006	0.3366***	16.0228	−0.0031***	−3.9478
BM	−0.0177***	−2.7713	0.1202**	2.4803	0.0273***	14.5063
ROA	0.0669***	3.6191	0.6135***	3.6925	−0.0122**	−2.3510
LEV	−0.0129	−1.1236	0.0900	1.2275	0.0266***	8.7816
ADV	0.1797*	1.8892	0.2951	0.5757	−0.0224	−1.2451
TNEWS	0.0000*	1.7297	−0.0011***	−8.2105	0.0000***	5.8798
SENTF	−0.0262***	−3.3136	0.0720	1.4465	−0.0047***	−2.7177
INDHOMO	0.0743**	2.1358	0.1200	0.5088	0.0236***	2.6640
TENURE	0.0002	0.5997	−0.0015	−0.7636	−0.0001	−1.4607
CEODIR	0.0003	0.0812	0.0048	0.2122	−0.0014*	−1.7327
DELTA	0.0017	0.8348	0.0304**	2.3352	0.0010	1.5838
VEGA	−0.0044***	−3.8787	−0.0035	−0.4198	−0.0003	−1.0753
STDRET	0.2755	1.1734	−10.1171***	−5.4644	−0.0408	−0.5636
ANALYST	−0.0042	−1.1505	0.1172***	4.7512	−0.0041***	−4.2640
BLOCK	0.0017	1.2377	0.0225**	2.3926	0.0008**	2.2040
Constant	1.0960***	33.7140	2.5083***	8.2732	0.0967***	9.5799
Year FE	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
Observations	6,030		5,004		6,352	
Adjusted R-squared	0.4434		0.2637		0.4925	

Notes: This table presents regression results of channel and consequence analyses. Panel A shows the mediation effect of *ROE* and *BRAND* on the association between tournament incentive (*TI*) and media sentiment (*SENT*). Columns (1) and (3) report the results of regressing *ROE* and *BRAND* on *TI*. Columns (2) and (4) capture the mediation effect of *ROE* and *BRAND* by regressing *SENT* on *ROE* and *BRAND* predicted from the first stage model. Panel B reports the impact of tournament incentive (*TI*) on idiosyncratic risk (*Idiosyncratic*), liquidity (*Inverse Quoted Spread*) cost of equity (*CoE*). The dependent variable *CoE* is implied cost of equity measured using Gebhardt, Lee, Swaminathan (2001) model. *HIGHSENT* is a dummy variable that takes the value of one if media sentiment is above the sample mean and zero otherwise. Appendix A provides definitions of all variables. The *t*-statistics are calculated based on robust standard errors, which are clustered by firm. *, **, and *** denote levels of significance at 10%, 5%, and 1%, respectively.

that at the presence of positive *TI-SENT* association, a firm's information dissemination becomes more efficient by mitigating investors' uncertainty about a firm's future earnings, profitability and valuation, which, in turn, will reduce idiosyncratic volatility of a firm's stock. The negative and statistically significant coefficient on *HIGHSENT* × *TI* (−0.0057) supports our prediction that firms facing higher media sentiment due to tournament incentives experience lower idiosyncratic volatility (lower information asymmetry) when faced with higher media sentiment. As an alternative measure of information asymmetry (Jain et al., 2016; Chung et al., 2010), we use inverse of quoted spread in Column (2).[6] Our results remain qualitatively similar.

Next, we examine how investors react towards the positive *TI-SENT* association. As we find that *TI-SENT* association reduces information uncertainty by encouraging high-level information dissemination, our next prediction is the positive *TI-SENT* association will help investors demand less return premium (lower cost of equity) for firms running higher promotion tournaments having higher media sentiment because investors' assessment about a firm's valuation and performance becomes easier under such superior information environment. The coefficient on *HIGHSENT* × *TI* in Column (3) of Panel B (-0.0014) supports our proposition. This is consistent with prior studies suggesting an increase in return premium (higher cost of equity) for firms with lower media coverage (Kothari et al., 2009). Overall, results in this section re-iterate our argument that within-firm tournament incentives can help a firm to create a positive outside image reflected in higher positive media sentiment.

6. Conclusion

In this study, we examine whether executives' tournament-based incentive can influence firms' media image. Using a sample of US public firms over the period 2002–2014, we find support for the "efficiency view" of tournaments that the tournament-based incentives improve firms' media sentiment, as measured by the press-initiated net positive sentiment. This result is robust to endogeneity concerns and alternative specifications. In subsequent tests, we find our results are more pronounced among firms with stricter non-competition enforcement, higher information opacity, lower analyst coverage, lower industry homogeneity, lower investor sentiment, and lower managerial ability.

This study fills the research gap of the impact of tournament-based incentives on media sentiment. It also provides additional evidence in the current debate on whether tournament-based incentives have a positive or negative impact on firms' performance. Our results suggest that tournament-based incentive can improve firms' public image, providing new insight into the value creation role of firm-level tournament-based incentives. Our results also have practical implications for corporate compensation policymakers. The results suggest that compensation designers should take into consideration the tournament-based incentives that are brought by the pay gap between CEOs and other executives if they wish to improve the firm's public image. Importantly, we suggest that a better media image for a firm driven by promotion-based tournaments can function as a governance mechanism and enhance a firm's information dissemination. Therefore, promotion-based tournaments could be used by the board to encourage top management to engage more with media, which, thereby, improve a firm's information environment.

Data availability

The authors do not have permission to share data.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

Table A15

[6] Higher bid-ask spread suggests opaque information environment and lower stock liquidity as uninformed market maker will try to make the spread wider with the purpose of guarding them against the possibility of loss while trading with informed participants in the market (Bardos, 2011). Thus, a positive association with an inverse of quoted spread suggest better quality information dissemination and lower information asymmetry where investors fear less about adverse selection problems.

Table A1
Variable list.

Variable	Definition
Dependent variables	
SENT	Press-initiated net positive sentiment for a firm, calculated as – (total positive sentiment – total negative sentiment/total number of news items). *Source:* TRNA.
PSENT	Press-initiated positive sentiment for a firm, calculated as – (total positive sentiment/total number of news items). *Source:* TRNA.
NSENT	Press-initiated negative sentiment for a firm, calculated as – (total negative sentiment/total number of news items). *Source:* TRNA.
Independent variables	
TI	Tournament-based incentives, calculated as the natural logarithm of the difference between a CEO's total compensation (TDC1) and the median total compensation (TDC1) of non-CEO executives. *Source:* ExecuComp.
RET	Annual stock return, calculated on the day of fiscal year-end. *Source:* CRSP
SIZE	Natural logarithm of market capitalization, where market capitalization is measured as – (total number of common shares outstanding * share price). *Source:* Compustat.
BM	Book to market ratio, calculated as – (book value of equity/market value of equity), in which the market value of equity equals to (total number of common shares outstanding * share price). *Source:* Compustat.
ROA	Return on assets, calculated as – (earnings before extraordinary item/total asset). *Source:* Compustat.
LEV	Leverage, calculated as – (long term debt + debt in current liabilities) / total asset. *Source:* Compustat.
ADV	Advertising expenditure calculated as – (total advertising expenditure / sales revenue). *Source:* Compustat.
TNEWS	Total number of news items. *Source:* TRNA.
SENTF	Firm-initiated net positive sentiment for a firm. *Source:* TRNA.
INDHOMO	Industry homogeneity, measured as the mean partial correlation of a company's return and an equally weighted industry index while holding the market return unchanged. *Source:* CRSP.
TENURE	CEO tenure. *Source:* ExecuComp.
CEODIR	A dummy variable with the value of one if the CEO is the only executive who is also a member of the board of directors. *Source:* ExecuComp.
DELTA	The natural logarithm of the sensitivity of a CEO's wealth given a 1 % change in stock price. *Source:* ExecuComp and CRSP.
VEGA	The natural logarithm of the sensitivity of a CEO's wealth when there is 1 % change in the stock return volatility. *Source:* ExecuComp and CRSP.
Variables used in additional analyses	
GINI	The income disparity level between CEO and other executives, calculated following Kale et al. (2009).
CDF	The normalized rank or cumulative density function (CDF) of gaps, calculated following Kale et al. (2009).
CV	The coefficient of variation of the pay gap between CEO and other executives. *Source:* ExecuComp.
NCOMINDX	The noncompetition enforceability index constructed by Garmaise (2009).
IND TI	The industry median value of tournament-based sentiment.
Low OP	A dummy variable with the value of one if a firm's volume of news coverage is lower than the sample mean. *Source:* TRNA.
High COV	A dummy variable with the value of one if a firm's analyst coverage is higher than the sample mean. *Source:* I/B/E/S.
High HOM	A dummy variable with the value of one if a firm's industry homogeneity is higher than the sample mean. *Source:* CRSP.
High INSENT	A dummy variable with the value of one if investor sentiment index (Baker and Wurgler, 2006) during a year is higher than the sample mean.
High ABL	A dummy variable with the value of one if a firm's managerial ability index (Demerjian, Lev and McVay, 2012) is higher than the sample mean.
ROE	Return on equity, calculated as – (earnings before extraordinary item/ total number of common shares outstanding * share price). *Source:* Compustat.
BRAND	Brand capital. Calculated as – (1-δ) $*BRAND_{t-1} + A_t BRAND_{t-1} + A_t$, in which δ is the depreciation rate, 50 %, as defined in Belo et al., (2014); and A_t, is the advertising expenditure. *Source:* Compustat.
CoE	Implied cost of equity premium. Calculated as the cost of equity estimated following Gebhardt et al. (2001) model.
Inverse Quoted Spread	Negative quoted spread, where the quoted spread is calculated as –ln ((bid price - ask price)/2) / ((bid price + ask price)/2)). *Source:* CRSP.
Idiosyncratic	Relative idiosyncratic volatility, calculated as the ratio of idiosyncratic variance to total variance. *Source:* CRSP.

References

Aggarwal, R.K., Samwick, A.A., 2006. Empire-builders and shirkers: Investment, firm performance, and managerial incentives. Finance 12 (3), 489–515.
Ahern, K., Sosyura, D., 2014. Who writes the news? corporate press releases during merger negotiations. J. Financ. 69 (1), 241–291.
Bainbridge, S.M., 2005. Executive compensation: who decides? Texas Law Review 83 (6), 1615.
Baker, M., Wurgler, J., 2006. Investor sentiment and the cross-section of stock returns. J. Financ. 61 (4), 1645–1680.
Bardos, K.S., 2011. Quality of financial information and liquidity. Rev. Financ. Econ. 20 (2), 49–62.
Baum, C., Schaffer, M., Stillman, S., 2007. Enhanced routines for instrumental variables/generalized method of moments estimation and testing. Stata J.: Promot. Commun. Statistics Stata 7 (4), 465–506.
Belo, F., Lin, X., Vitorino, M.A., 2014. Brand capital and firm value. Rev. Econ. Dyn. 17 (1), 150–169.
Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. J. Econ. 87 (1), 115–143.
Brick, I.E., Palmon, O., Wald, J.K., 2006. CEO compensation, director compensation, and firm performance: evidence of cronyism? Finance 12 (3), 403–423.
Bushee, B., Core, J., Guay, W., Hamm, S., 2010. The role of the business press as an information intermediary. J. Account. Res. 48 (1), 1–19.
Cahan, S., Chen, C., Chen, L., Nguyen, N., 2015. Corporate social responsibility and media coverage. J. Bank. Financ. 59, 409–422.
Chen, Y., Cheng, C.S., Li, S., Zhao, J., 2020. The monitoring role of the media: evidence from earnings management. J. Bus. Financ. Acc. 31 (1).
Chen, T., Harford, J., Lin, C., 2015. Do analysts matter for governance? Evidence from natural experiments. J. Financ. Econ. 115 (2), 383–410.
Chen, Z., Huang, Y., Wei, K., 2013. Executive pay disparity and the cost of equity capital. J. Financ. Quant. Anal. 48 (3), 849–885.
Cheng, I. H. (2011). Corporate governance spillovers. Available at SSRN 1299652.
Chowdhury, H., Shams, S., 2021. Does firm life cycle have impacts on managerial promotion tournament incentives? Aust. J. Manag. 46 (4), 593–628.
Chung, K.H., Elder, J., Kim, J.C., 2010. Corporate governance and liquidity. J. Financ. Quant. Anal. 45 (2), 265–291.

Conyon, M.J., He, L., 2011. Executive compensation and corporate governance in China. Finance 17 (4), 1158–1175.
Core, J., Guay, W., 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. J. Account. Res. 40 (3), 613–630.
Core, J., Guay, W., Larcker, D., 2008. The power of the pen and executive compensation. J. Financ. Econ. 88 (1), 1–25.
Correa, R., Lel, U., 2016. Say on pay laws, executive compensation, pay slice, and firm valuation around the world. J. Financ. Econ. 122 (3), 500–520.
Dai, L., Parwada, J.T., Zhang, B., 2015. The governance effect of the media's news dissemination role: Evidence from insider trading. J. Account. Res. 53 (2), 331–366.
Demerjian, P., Lev, B., McVay, S., 2012. Quantifying managerial ability: A new measure and validity tests. Manag. Sci. 58 (7), 1229–1248.
DiPrete, T., Eirich, G., Pittinsky, M., 2010. Compensation benchmarking, leapfrogs, and the surge in executive pay. Am. J. Sociol. 115 (6), 1671–1712.
Dougal, C., Engelberg, J., García, D., Parsons, C., 2012. Journalists and the stock market. Rev. Financ. Stud. 25 (3), 639–679.
Drake, M.S., Guest, N.M., Twedt, B.J., 2014. The media and mispricing: the role of the business press in the pricing of accounting information. Account. Rev. 89 (5), 1673–1701.
Dyck, A., Volchkova, N., Zingales, L., 2008. The corporate governance role of the media: Evidence from Russia. J. Financ. 63 (3), 1093–1135.
Eisfeldt, A.L., Kuhnen, C.M., 2013. CEO turnover in a competitive assignment framework. J. Financ. Econ. 109 (2), 351–372.
Engelberg, J., Parsons, C., 2011. The causal impact of media in financial markets. J. Financ. 66 (1), 67–97.
Falato, A., Li, D., Milbourn, T., 2015. Which skills matter in the market for CEOs? evidence from Pay for CEO Credentials. Manag. Sci. 61 (12), 2845–2869.
Fang, L., Peress, J., 2009. Media coverage and the cross-section of stock returns. J. Financ. 64 (5), 2023–2052.
Faulkender, M., Yang, J., 2010. Inside the black box: The role and composition of compensation peer groups. J. Financ. Econ. 96 (2), 257–270.
Garmaise, M., 2009. Ties that truly bind: noncompetition agreements, executive compensation, and firm investment. J Law Econ Organ 27 (2), 376–425.
Gebhardt, W.R., Lee, C.M., Swaminathan, B., 2001. Toward an implied cost of capital. J. Account. Res. 39 (1), 135–176.
Gurun, U., Bulter, A., 2012. Don't believe the hype: local media slant, local advertising, and firm value. J. Financ. 67 (2), 561–598.
Haß, L.H., Müller, M.A., Vergauwe, S., 2015. Tournament incentives and corporate fraud. Finance 34, 251–267.
Humphery-Jenner, M., Lisic, L.L., Nanda, V., Silveri, S.D., 2016. Executive overconfidence and compensation structure. J. Financ. Econ. 119 (3), 533–558.
Jain, P., Jiang, C., Mekhaimer, M., 2016. Executives' horizon, internal governance and stock market liquidity. Finance 40, 1–23.
Jensen, M.C., Murphy, K.J., 1990. Performance pay and top-management incentives. J. Polit. Econ. 98 (2), 225–264.
Jia, N., 2018. Tournament incentives and stock price crash risk. Account. Horiz. 32 (3), 101–121.
Kale, J.R., Reis, E., Venkateswaran, A., 2009. Rank-order tournaments and incentive alignment: The effect on firm performance. J. Financ. 64 (3), 1479–1512.
Kini, O., Williams, R., 2012. Tournament incentives, firm risk, and corporate policies. J. Financ. Econ. 103 (2), 350–376.
Kothari, S.P., Li, X., Short, J.E., 2009. The effect of disclosures by management, analysts, and business press on cost of capital, return volatility, and analyst forecasts: a study using content analysis. Account. Rev. 84 (5), 1639–1670.
Kubick, T.R., Lockhart, G.B., 2016. Do external labor market incentives motivate CEOs to adopt more aggressive corporate tax reporting preferences? Finance 36, 255–277.
Lazear, E.P., Rosen, S., 1981. Rank-order tournaments as optimum labor contracts. J. Polit. Econ. 89 (5), 841–864.
Li, Z.F., 2014. Mutual monitoring and corporate governance. J. Bank. Financ. 45, 255–269.
Liang, H., Renneboog, L., 2017. On the foundations of corporate social responsibility. J. Financ. 72 (2), 853–910.
Mian, G.M., Sankaraguruswamy, S., 2012. Investor sentiment and stock market response to earnings news. Account. Rev. 87 (4), 1357–1384.
Murphy, K.J., 1999. Executive compensation. Handbook Labor Econ. 3, 2485–2563.
Pástor, Ľ., Pietro, V., 2003. Stock valuation and learning about profitability. J. Financ. 58 (5), 1749–1789.
Peress, J., 2014. The media and the diffusion of information in financial markets: Evidence from newspaper strikes. J. Financ. 69 (5), 2007–2043.
Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: comparing approaches. Rev. Financ. Stud. 22 (1), 435–480.
Phan, H., Simpson, T., Nguyen, H., 2017. Tournament-based incentives, corporate cash holdings, and the value of cash. J. Financ. Quant. Anal. 52 (4), 1519–1550.
Prendergast, C., 1999. The provision of incentives in firms. J. Econ. Lit. 37 (1), 7–63.
Rajgopal, S., Venkatachalam, M., 2011. Financial reporting quality and idiosyncratic return volatility. J. Account. Econ. 51 (1–2), 1–20.
Roberts, M.R., Whited, T.M., 2012. Endogeneity in empirical corporate finance. Handbook of the Economics of Finance, Vol. 2. Elsevier, pp. 493–572.
Shen, C., Zhang, H., 2017. Tournament incentives and firm innovation. Eur. Finan. Rev. 22 (4), 1515–1548.
Shi, W., Connelly, B.L., Sanders, W.G., 2016. Buying bad behavior: tournament incentives and securities class action lawsuits. Strateg. Manag. J. 37 (7), 1354–1378.
Shipman, J.E., Swanquist, Q.T., Whited, R.L., 2017. Propensity score matching in accounting research. Account. Rev. 92 (1), 213–244.
Solomon, D., 2012. Selective publicity and stock prices. J. Financ. 67 (2), 599–638.
Staiger, D., Stock, J., 1997. Instrumental variables regression with weak instruments. Econometrica 65 (3), 557–586.